A Risk Assessment Method for Online Social Transparency in Enterprise Information Systems

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Abstract

Enterprises integrate social networking tools within their information systems to enhance social networking, situational awareness, coordination and collaboration amongst their members. Social interaction can be empowered by traditional tools such as E-mail, or specialised social platforms, including Workplace by Facebook and Slack. More specialised systems enable bespoke features to declare, share and retrieve current and past engagements, team memberships, allocated tasks and priorities. Social transparency refers to the intentional sharing of information relating to intentions and reasoning of individual actions to others in the workplace. This includes announcing personal interests, activity status, priorities and personal achievements in order to explain individual intentions. Such transparency is typically intended to increase relatedness, motivation, coordination and trust amongst colleagues. However, an ad-hoc implementation of such transparency can pose issues such as information overload, social loafing, motivating unwanted grouping amongst colleagues and increasing pressure to perform in a particular manner.

Although the current works on transparency and its effects illuminate the potential promise of managing social transparency in the enterprise, particularly in their online platforms, scholars still handle social transparency as an information quality issue and there is a lack of concrete knowledge about its potential risks and their factors. Moreover, there is a lack of systematic methods to evaluate and assess the quality of online social transparency in general and its shortcomings and risks in particular. In this research, we address the question of how to manage social transparency by identifying and assessing the risks of its ad-hoc practice. We provided a working definition of social transparency, and we assume that this transparency is an autonomous decision by organisation members to be open when conveying social information through online platforms.

This research aims to provide a systematic method to identify and assess the risks of online social transparency within organisation members. To achieve the goal of this research, a qualitative approach has been adopted to explore the risks of online social transparency and how this transparency can be assessed. Implementing this approach resulted in several empirical studies involving employees, managers, systems analysts. Two focus groups resulted in exploring the concept of online social transparency and the assessment factors. An Interview study contributes to that aim by creating classifications of users' perspective on risks and risk factors. An observational study conducted in two small multicultural companies to further explore the risks and risk factors from real organisational contexts. A novel assessment method for online social transparency was developed from these studies to assist system analysts and enterprise management in identifying and assessing the impact of online social transparency in their work environment.

Table of Contents

Table of Figures

List of Tables

Acknowledgment

1.   INTRODUCTION

In organisational studies, transparency refers to the openness culture with external and internal stakeholders. Internally transparent organisations are open to sharing information within and across departments and teams, and from both top-down and bottom-up (Parris et al. 2016). Externally transparent organisations are open to sharing information with customers, supply chain members, investors and partners (Parris et al. 2016). Researchers who have called upon the openness culture in organisation-stakeholder relationships have consistently advocated its role in building or maintaining trust relationship (Schnackenberg and Tomlinson 2016), employee engagement (Vogelgesang et al. 2013), employee motivation (Marlow and Dabbish 2014). In the organisation, transparency is practiced either as a means of complying with obligations or voluntarily to enhance openness culture, collegiality and business sustainability (Pirson and Malhotra 2011). Transparency as a means of complying with obligations refers to information demanded by stakeholders for their functionalities. For example, the enterprise may be obliged by law to share data with stakeholders which is known as freedom of information (Michener and Bersch 2011). Transparency that is practiced voluntarily is termed as social transparency because employees adopt it to build relationship and affinity over time. Social transparency practiced to raise awareness and improve productivity such as transparency about employee skills, experiences and work conditions (Madhani 2009). Consider this ordinary situation:

At the break time in the workplace, discussion with colleagues may include the time they arrived at the workplace, delays in the way to work, what they are working on recently, what they like most in the work they do, and whether they have plans to do further work. Employees noticed that they make decisions based on the awareness of those around them. They may decide to help a colleague who struggles in solving a certain problem that they experienced before. They're concerned that they may take time and cause a delay in finishing the work on time. They may decide to talk with their colleague via phone regarding minor consultations because they put a status showing that he/she is in a training course outside the company.

These situations are unremarkable in the workplace. Nevertheless, they end up building a piece of knowledge about peers and their activities. Employees make countless decisions based on this knowledge and the activity of people around them. Social actors in the enterprise information systems are immersed in the environment of social information that made them evolved an extreme sensitivity to the activity and interaction of their colleagues — for example, deciding to

engage in a collaborative activity because it matches the genuine interest of such activities. Similarly, in the world of digital systems, knowledge about employees and their activities can be gathered from transparency in their emails, calendars and Enterprise Social Software (ESS) such as Slack, Yammer, and Workplace by Facebook. Transparency, referred to in this thesis, has a voluntary nature and is conceptualised as disclosing social information amongst employees through online organisational software, which this information related to employees and their activities and is not required for peers' functionalities. Transparency in this thesis is more than sharing information, it is about explaining personal reasonings and intentions to help others understand the purpose of acting in certain manner. Such transparency is voluntary and not a requirement for accomplishing other's activities and works. For example, being open about personal interest in performing collaborative activity can be seen as expression of self-intentions, but collaborators do not need this information to accomplish their assigned activities. This information may help collaborators to avoid incorrect assumptions and inferences about colleague's action that may result in miscommunication at best and work conflict at worst.

From the perspective of organisational information systems, a few researches have conceptualised and studied social transparency and its effect on the overall performance of the organisation. Erickson and Kellogg (2000) argued that social transparency between co-workers and making them aware when someone involved in a joint project, would encourage participation and promote collaborative work. They describe the notion of social transparency and provide a framework for designing conversationally based knowledge communities that support transparency functionalities such as activity and conversation visualisation. Stuart et al. (2012) state that there are three types of social transparency can be considered in online information exchange: 1) identity transparency which refers to the visibility of the identity of the information sender and receiver, 2) content transparency which refers to the visibility of actions flows made on the information and 3) interaction transparency which refers to the visibility of information exchange to a third party. They studied the influence of these three types of transparency on the outcome of groups and organisations such as the influence on their productivity, creativity, information quality, stress and herding.

Despite the positive connotations of social transparency, it seems that current digital tools are primitive and have substantial shortcomings regarding their facilitation of social transparency. In this thesis, the author argues that despite the decisive role of social transparency in enterprise information systems, the incomplete or limited fashion of implementing social transparency has potential risks such as disturbance, information overload and lack of interest (Laud and Schepers

2009; de Fine Licht 2011). For example, an unguided online transparency between team members can lead to risks of information misuse, undesirable staff groupings, stressful competitions and information overload (Laud and Schepers 2009). The negative impact of transparency in organisational information systems mainly stems from its usage or perceived usage as a performance tracking mechanism as well as a pressure mechanism to increase work quality and productivity. Transparency can be used to assess and motivate individuals through self- and peer-comparison based on monitoring their status, activities, and performance in terms of quantity and quality. However, tracking performance and peer comparison can increase the perception of transparency as an exploitation mechanism (Dabbish et al. 2012). Pressure stems from a feeling of being watched and monitored by other parties in the workplace, although the information itself may not necessarily be private. This includes visibility of recent activities and the pace of progress to all members of the organisation.

Enterprises adopted an approach to identify, assess, and prepare for any potential risks that may interfere with an organisation's operations and objectives. This approach named Enterprise Risk Management (ERM). ERM provides a framework which involves identifying risks, assess them in terms of likelihood and level of impact, determine a management strategy and monitoring the process (Hoyt et al. 2011). It is commonly acknowledged that of all the stages of ERM, risk identification and assessment stages have the largest impact in the accuracy of risk management process (Chapman 1998b; Mojtahedi et al. 2010; Carroll 2016). In the scope of this research, the risks of online social transparency and its identification and assessment techniques are scarce in the literature of enterprise information systems. However, some empirical studies on assessing online transparency have examined information disclosure of organisational reports, such as disclosing financial reports to the public and the effect of such transparency on their spending and budgeting (Lourenço et al. 2013). Such works tend to rely on assessing online transparency against specific standard requirements and compare paper-based information disclosure with internet-based reports. As we will discuss later in chapter 2, these assessment approaches usually consider the quality dimension of information transparency such as completeness, relevance, timeliness comparability, understandability and reliability (Caba Pérez et al. 2008). Some of transparency assessment approaches reported in the literature include analysing the features of digital tools and technical issues such as usability of user interface and navigation facilities (Pina et al. 2007). Further assessment approaches have been developed for specific purposes. For example, Lourenço et al. (2013) developed a model that provides an analysis tool to assess web-based transparency

for accountability. The model focuses on three attributes related to online transparency and website technical aspects: visibility, format and delivery mode.

Although existing works illuminate the potential promise of managing social transparency in the enterprise, particularly in their online platforms, it is possible to state that the literature of online social transparency is under-researched, and there is still a limitation in providing conceptualisations and methods to help assess it systematically. The existing empirical works in the literature show limitations when assessing the risk aspect of social transparency:

- Scholars still handle social transparency as an information quality issue, and there is a lack of empirical works that address online social transparency as autonomous behaviour by individuals. For example, (do Prado Leite and Cappelli 2008) treated transparency as a quality requirement for software system and, therefore, soft-goal interdependency graphs were used to conceptualise transparency and several quality requirement related to it.

- Less effort, or probably no effort, is made to formally identify the negative consequences of social transparency;

- Several studies focus on the consequences that stem from information quality and technical issues, marginalising the subject of transparency (the types of disclosed information). For example, (Erickson and Kellogg 2000; Stuart et al. 2012) studied the effect of activity and identity transparency on the individual and organisational performance.

1.1   RESEARCH SCOPE

This section delineates the boundaries of the research problem and tailor down the specific areas that will be addressed in this thesis. Social transparency is one of the new research areas and has not been formally defined in the literature. Social transparency is usually described as conveying social information amongst individuals through online and offline mediums (Erickson and Kellogg 2000; Dabbish et al. 2012). Therefore, there always a chance to question the meaning of social transparency and its relation to other concepts such as secrecy and privacy.

Social transparency in this thesis can be described as an intersection area between transparency, secrecy, and privacy as presented in Figure 1. Although these three concepts seem to be their respective opposite, there are several shared properties amongst them. To discuss these concepts, some preliminary definitions are necessary. Secrecy defined as "intentional concealment of information from actors by actors in organisations" (Costas and Grey 2014). Intentional privacy defined as "the right of the individual to forbid/prevent further communication of observable events and exposed features" and "limit access to personal information that can be used to identify

an individual" (Campisi et al. 2009). Transparency defined as "intentional information provision" (Grimmelikhuijsen 2012). For example, an organization or person deliberately chooses to disclose information about its internal workings. Thus, secrecy, privacy, and transparency are all based on decision; there require to be actors that withhold or disclose the information from other actors, and both are part of social relations.

In addition, transparency, secrecy, and privacy can be practiced voluntarily (Bowie and Jamal 2006) or controlled by regulations or policies (Weil et al. 2006). In the scope of action, these concepts have an impact on personnel within organisations as they limit it for some and enhance it for others. While secrecy and privacy enhance the room of maneuver and enable the opportunity to make change for information keepers/ owners, transparency enhances it for information recipients (DePaulo et al. 2003). Equally, secrecy and privacy limit the possibilities for actors who denied and excluded from accessing secure/private information and voluntary transparency limits those who have to receive information (De Fine Licht et al. 2014).
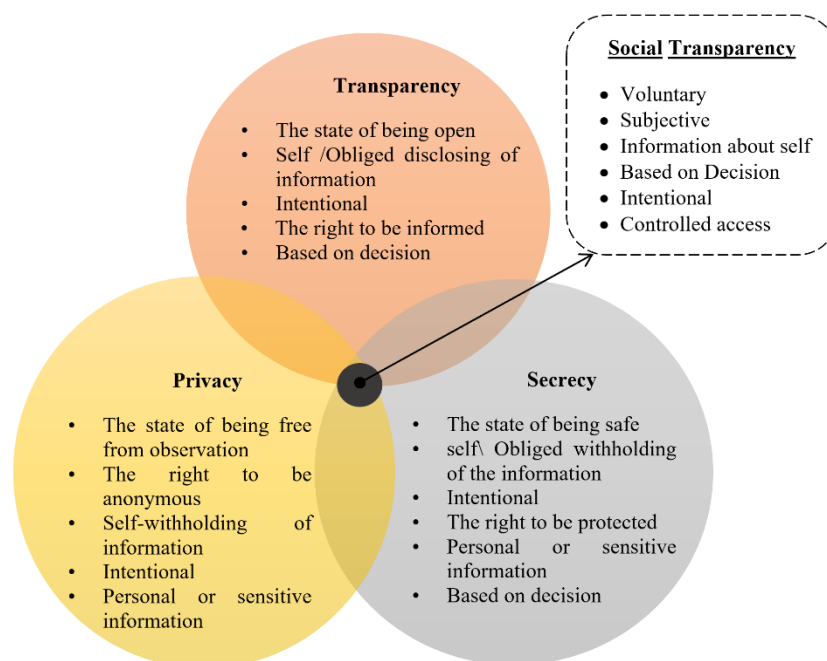
FIGURE 1: CHARACTERISTICS OF SOCIAL TRANSPARENCY

The existing definitions of online social transparency found in the literature show that the available features of online platforms restrict social transparency. In this thesis, the researcher focuses on social transparency within organisations. Therefore, the first step in this research was

proposing an introductory definition of online social transparency to illuminate the concept of social transparency and eliminate confusion with other concepts. We define social transparency as:

The voluntary use of online platforms by the members of an organisation to share their own information about their situation, roles and responsibilities with other members. (Alsaedi et al. 2019b)

This voluntary sharing is typically to enhance situational awareness, coordination, and collaboration quality. Examples of information shared include task priorities, workload, social interdependencies, current activities, level of skills and level of interest in specific tasks and objectives. In order to describe the phenomenon sufficiently in this thesis, we set the following assumptions:

- Social transparency is practiced voluntarily without any obligation from higher authority. This thesis does not consider the regulatory transparency when people are obliged to be transparent about certain information.
- Social transparency is practiced through online platforms. This assumption excludes the offline/ face to face form of social transparency.
- The disclosed information is not related to the functionality of others. This assumption eliminates the functional attribute of transparency which affects individual ability to see the information necessary to achieve their goals (Tu et al. 2016).
- The disclosed information does not include secrets and private information. By assuming this, we exclude any enquiries about the secrecy and privacy attributes of the disclosed information.

1.2 RESEARCH AIM

This research aims to propose a systematic method for assessing online social transparency in enterprise information systems and support enterprise management and system analysts to detect and prioritise risks that stem from unguided conduct of social transparency.

1.3 RESEARCH QUESTIONS

Since the research will study the risks of online social transparency in the workplace environment, then the research will find out ***how online social transparency can be assessed and analysed in order to detect and prioritise the risks and their factors.***

To cover the main question of this research, the researcher needs to explore:

- RQ1: What are the assessment factors for online social transparency?
- RQ2: What are the risks and their factors that stem from unmanaged behaviour of online social transparency?
- RQ3: How to aid analysts and enterprise management in the assessment of online social transparency?

1.4   RESEARCH OBJECTIVES

- **Objective 1: Identifying the gap in the literature of social transparency in enterprise information systems**

    The first objective of this research is to identify and analyse the literature relating to social transparency in enterprise. This objective will explore, if there is, the current methods and approaches that are used to assess social transparency in enterprise information systems. Moreover, reviewing the literature of transparency enable us to articulate the phenomenon of social transparency in this thesis and distinguish it from other concepts such as secrecy and privacy. This objective was essential to determine the research scope and set the research assumptions.

- **Objective 2: Exploring the assessment factors for online social transparency**

    This objective aims to explore the assessment factors in relation to online social transparency that has been identified in Objective 1 as they were undiscovered in the literature. The research aims to assess social transparency on online platforms by discovering the factors that relate to social transparency and help with the decision about how and when to be transparent (Alsaedi et al. 2019a). Moreover, the assessment factors discovered in this objective will support decision-makers in planning for mitigation strategies. So far, exploring the literature has introduced primitive factors that are related to assessing social transparency, such as the appropriate time to reveal information; this does not mean an absolute time but rather the relative time when information is useful and available. Other examples are the level of information detail, the level of dependency between actors and as well as user characteristics. Information related to the users' needs, skills, preferences and abilities is also an important factor in assessing social transparency in online enterprise platforms. **Chapter 4** discusses the assessment factors that resulted from the conducting of the first empirical study in this research.

- **Objective 3: Exploring the risks and risk factors of online social transparency**

    Literature on social transparency has studied the functional value of transparency as a possible way to enhance quality of collaborative work (Huang and Fu 2013a), enhance accountability in collaboration (Erickson and Kellogg 2000) and motivating workers by displaying information about workers doing the same task (Kinnaird et al. 2013). There is a lack of works that investigate the negative consequences of social transparency concepts, particularly, its online form. Therefore, this objective aims to provide a holistic view and conceptualised of the potential risks and their factors that occur amongst enterprise members. The outcomes from this objective help systems analysts and enterprise management to gain a holistic idea about the sources of risks that might affect the individual wellbeing, performance and consequently the enterprise productivity. **Chapter 5 and 6** introduce the most likely types of risks and risk factors that might hinder the successful implementation of social transparency to accomplish its main goals and advantages to the workplace environment.

- **Objective 4: Designing a systematic method to assess and evaluate online social transparency.**

    This research sets out to devise a systematic method that can detect risk factors of social transparency in the workplace. Examples of risk factors include **timing** (when the intended information should be revealed), **relevance** (why the intended information should be revealed) and **presentation** (how the intended information should be revealed). This method will be based on the factors explored in Objective 2 and 3. The method will be supported with risk analysis tool and designated analysis techniques to facilitate detecting the potential risks of social transparency in enterprise information systems, as described in **Chapter 7**. Therefore, by using the method, system analysts and managers will be able to assess social transparency in an As-Is system and extract and rank the risks that may stem from its unmanaged practice amongst enterprise members. The method proposed risk ranking technique based on the organisational goal model. The goal model used to design risk ranking criteria to examine the impact of the risk based on the affected activity, the dependency with other activities, and the availability of alternatives. Moreover, the goal model used to design a technique that identifies the direct and indirect stakeholders affected by the occurrence of certain risks. The method will be used to make informed decisions in order to develop options and actions to reduce threats of social transparency to the enterprise work environment.

- **Objective 5: Evaluating the proposed assessment method for identifying the risks of online social transparency**

    The result from the previous objectives will be evaluated by applying the method to a particular case study and examining the effectiveness of the assessment method to detect cases where risks could occur. The evaluation study will involve decision–making stakeholders to assess the ability of the proposed method in detecting the risks loci in relation to the implemented online social transparency. The evaluation study aims to target different information systems that use different forms of online social transparency. The evaluation study will assess the proposed method based on different qualities (Understandability- Helpfulness- Effectiveness-Comprehensive) from decision-makers' points of view. **Chapter 8** discuss the results of the evaluation study on two different case study.

1.5 BENEFICIARIES

The method to be proposed is ultimately aimed at enriching the staff experience in the workplace. Research has shown that lack of transparency can result in lack of trust and clustering amongst staff (Hosseini et al. 2016a). Research has also shown that transparency could be equally detrimental to staff experience through distraction, information overload, and bias (Hosseini et al. 2015). Management of enterprises are typically concerned with the productivity as well as the well-being of staff. Hence, enhancing the transparency management in a way that they can also manage its side-effects is a primary goal for them. By following the stages and activities in the structured assessment approach, the management is able to prepare the settings for the assessment process and specifically prepare employees to take part in this process.

Assessing social transparency involves an intense human factor making classic assessment techniques tedious, e.g., prediction, interviews, focus groups, user stories. Advanced techniques that will stimulate the sampled users thinking and speculation would be needed. Hence, with the method proposed in this thesis, the analysts will get a bespoke toolkit specialized for assessing this category of transparency and supporting them in both the detection of risk sources and the planning process of reducing and mitigating these risks. The assessment method designed to help system analysts to collect the risks and risk factors from real contexts by using a self-reporting technique (i.e. an observation sheet). The observation sheet can be implemented automatically in a form of software that allow employees to provide their observations in real time manner. The dynamic nature of social transparency and the pace of changes in risks occurrence requires the

management and system analysts to react quickly to these changes and make decision. Managers and system analysts need to understand high volume of data collected from employees before they make a decision. The assessment method supported by risk analysis tool that designed as business intelligence tool to interpret big data collected from employees and use interactive dashboard to develop and run several enquiries against the data, create report and data visualisation to make the results available to decision makers. In addition, it is supported by two risk analysis techniques that designed to integrate enterprise goal model in the analysis process, as explained in chapter 7. These techniques enable system analysts to assess and prioritise risks based on their impact on the enterprise goals, activities and internal stakeholders.

Risk assessment and analysis traditionally considered a critical activity for the whole software system lifecycle particularly the development phase. Social transparency in this research is practiced by using online platforms such as enterprise social software (ESS). However, as mentioned earlier in this chapter that these online platforms are primitive and have substantial shortcomings regarding their facilitation of social transparency. Therefore, enterprises may think of solutions to improve their online platform specially ESS to hinder the risks of social transparency by redesign the online platforms to be more sensitive to employees' activities, context and preferences. The proposed method and its supporting materials i.e. risk analysis tool and goal-based risk analysis techniques enable system analysts and system designers to identify the risks and risk factors and handle them by suitable countermeasure through identify the requirements for a refined design of the enterprise social software. Figure 2 shows that system analysts and system designers are the direct beneficiaries of this research; staff and organisation managements as indirect beneficiaries.
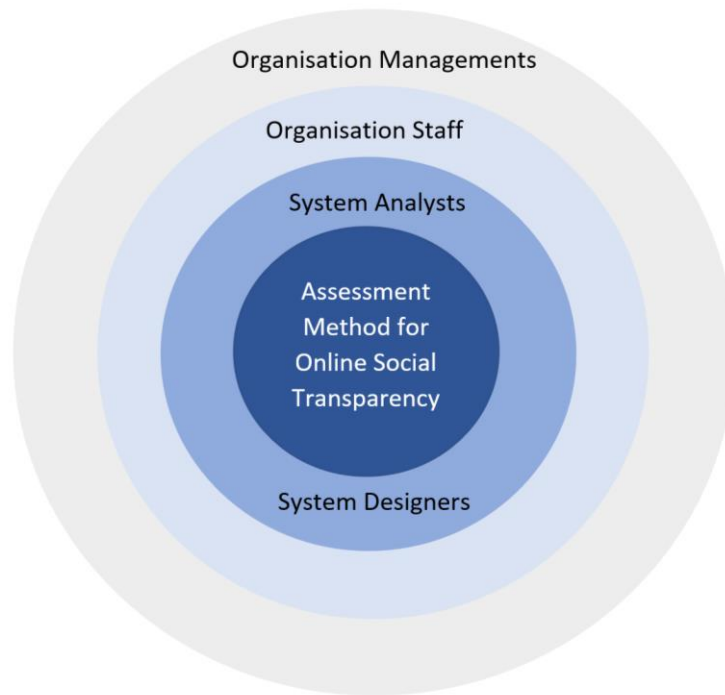
FIGURE 2: RESEARCH BENEFICIARIES

1.6 THESIS STRUCTURE

This thesis is structured as follows: **Chapter 2** presents the literature review for this research; this chapter addresses various relevant topics in relation to social transparency to help in identifying and solving the research problem. Next, **chapter 3** presents the strategy that this research will follow in order to achieve the research aim and objectives. It provides a full overview of different qualitative research paradigms, research approaches, research methods and data collection and analysis. It also argues the adopted research paradigm, approach and methods used in this research. Then, **chapter 4** explains the first empirical study in this research that was conducted to derive the factors for assessing online social transparency. **Chapter 5** describes the second study in this research (interview study) and provides a conceptualisation of the recognised risks and their sources. This chapter also provides a reference model that used as a baseline in designing a systematic method for assessing social transparency. After that, **chapter 6** illustrates further

resources in relation to the risk s of online social transparency derived from observation study. **Chapter 7** explains the proposed assessment method of online social transparency. Then, in **Chapter 8**, the evaluation process of the proposed method is explained. Finally, **Chapter 9**, provides a summary of the thesis and discuss its contribution to the knowledge, limitations and future works. The structure of the thesis chapters and road map is illustrated in Figure 3.

1.7   THESIS PUBLICATIONS

- Alsaedi, T., Phalp, K. and Ali, R., 2019, October. Towards an assessment method for social transparency in enterprise information systems. In 2019 IEEE 23rd International Enterprise Distributed Object Computing Workshop (EDOCW) (pp. 136-145). IEEE. DOI: 10.1109/EDOCW.2019.00033

- Alsaedi, T., Stefanidis, A., Phalp, K. and Ali, R., 2019, October. Social transparency in enterprise information systems: peculiarities and assessment factors. In 2019 6th International Conference on Behavioral, Economic and Socio-Cultural Computing (BESC) (pp. 1-4). IEEE. DOI: 10.1109/BESC48373.2019.8963048

- Alsaedi, T., Phalp, K. and Ali, R., 2019, December. Online Social Transparency in Enterprise Information Systems: Risks and Risk Factors. In International Conference on Research and Practical Issues of Enterprise Information Systems (pp. 97-111). Springer, Cham. DOI: 10.1007/978-3-030-37632-1_9

1.8   DECLARATION OF CO-AUTHORS CONTRIBUTION

The author of this thesis is the first author of all the resulted publications from this thesis work. The contribution of the first author was as follows:
- Formulating the idea and aim of each paper.
- Deciding upon the research approach and method to be adopted in each paper (e.g. qualitative research approach and methods like focus groups, interviews).
- Designing and implementing the empirical studies presented in each paper (e.g. developing interview scripts, recruiting the participants, collecting the data…etc.).

- Analysing and interpreting the collected data and draw the conclusions (e.g. qualitative thematic analysis).

- Reporting the findings and writing each paper.

The co-authors contributed to the published papers in terms of verifying and validating the studies' findings by comparing them against the actual responses from the participants. They also provided guidance and feedback on the structure and the overall articulation of the papers' message. In addition, they gave insights on the methodology and also checked the writing quality and suggest modifications on some parts of the text. Furthermore, the co-authors enriched the papers with the appropriate terminologies in certain places especially those related to the venue where the papers were published.

1.9   CHAPTER SUMMARY

This chapter provides an introduction to the context and domain of this thesis, discussed the rationale for this thesis. It also introduced the aim, research questions, objectives, the scope and the beneficiaries of this thesis. In addition, this chapter provided the list of publications that resulted from this research and explained the authors and co-authors' contributions in the publications. The next chapter will provide a review of the research topics and domains related to this thesis work.

Chapter 1
- Research Scope and Context
- Research Aim and Questions
- Research Objectives
- Research benefecires

Chapter 2
- Analysing for current related works
- Identifying research gap

Chapter 3
- Research Paradigm
- Research Approach
- Research Methods

Chapter 4
- Exploring the concept of online social transparency in enterprise
- Exploring assessment factors of online social transparency

Chapter 5
- Explore risks of online social transparency
- Exploring the risks factors
- Building a reference model for the assessment process

Chapter 6
- Confirming the previous findings from real context
- Exploring further risk and risk factors from used online platforms
- Providing classifications of the risks

Chapter 7
- Proposing an assessment approach
- Designing a special data collection method
- Designing a risk analysis tool

Chapter 8
- Evaluate the proposed assessment method
- Experts Checking
- Comparison study

Chapter 9
- Conclusion and benefits
- Contributions
- Future works

FIGURE 3: ROAD MAP OF RESEARCH CHAPTERS

2.   LITERATURE REVIEW

This chapter presents the existing viewpoints and definitions of social transparency in organisational context, its related effects, concepts, and design approaches. Furthermore, reviewing of further topics related to organisational behaviour, CSCW, and some related concepts and theories will be provided to enrich the understanding of the digital application of social transparency and its effects on enterprise members.

This chapter will also discuss the effects of social transparency in various areas, challenges in designing social transparent systems, approaches to manage the application of such transparency and risk management in enterprise. All these research efforts will help to define the research problem and scope as well as produce the materials used to initiate the scientific investigation in this thesis.

2.1   EXISTING CONCEPTS OF TRANSPARENCY

Transparency is a subject that has gained attention from a variety of fields of research, including sociology, philosophy, management , Accounting , business administration, financial market, and public relations. (Hosseini et al. 2016a) declare that the ongoing attempts by governments, organisations, and individual around the world to publish information online (i.e., on the internet) and offline (i.e., through periodicals, journals, newspapers, books, word of mouth.) are reliable indicators of shifting form "the privacy age" to "the transparency age". Reviewing studies on organisational transparency shows that enterprises are demanded by the public to be more transparent and therefore, their loyalty and trust are increasing and Information communication technology (ICT) contributes to this case (Bandsuch et al. 2008; JenaAbadi and Mobasheri 2014; Albu and Flyverbom 2019). In short, transparency is the buzzword of the current century as time is going on.

The term transparency appears in various subfields in computing. Transparency has different meanings depending on the context, such as in networks, distributed systems, computer graphics, or software engineering. Transparency can be used in networks and distributed systems as a notion of invisibility. For example, transparency is defined as "the property that makes the user unaware of the fact that they are interacting with a network" in the dictionary of the internet (Ince, 2009). Similarly, transparency in distributed systems defined as an aspect of making the distribution invisible to the client or the application users to provide a centralized view of the system without worrying about the design and implementation details of the system (Coulouris et al., 2005).

In other areas of computing, transparency has the notion of openness and availability. Several definitions in the literature are in line with this notion. (Rawlins 2008a) defines transparency as "the deliberate attempt to make available all legally releasable information positive or negative in nature, in an accurate, timely, balanced, and unequivocal manner in order to improve the reasoning ability of the public and hold organisations accountable for their actions". Curtin and Meijer (2006) define transparency as the extent to which one entity discloses relevant information about its decision processes, procedures, performance and functioning. Transparency in risk management defined as "a condition that all functions of software are disclosed to users" (Meunier 2008). Similarly, Tu et al. (2011) defined transparency in software engineering as "the notion of making information available and accessible to the stakeholders".

Additionally, transparency has also been investigated in organisational contexts. Vogelgesang and Lester (2009) argue that transparency is the cornerstone of organisational performance, employee engagement, customer loyalty, and social and ecological sustainability. Womack and Jones (1997) define transparency in organisation projects as "The placement in plain view of all tools, parts, production activities, and indicators of production system performance, so the status of the system can be understood at a glance by everyone involved". Transparency can also provide feedback on the performed activities, support decision making, facilitate coordination by revealing interdependencies, and enable improvement (Lamming et al. 2004).

From an organisational behaviour perspective, (Parris et al. 2016) states that the majority of the articles discuss transparency in terms of organisation's openness that related to sharing information within organisation or with external stakeholders. While not all authors explicitly used the term "open" the meaning was implied. Examples of definitions that observed by Parris et al. (2016), transparency are conceptualized as:

- Openly and freely sharing information

- An ability of consumers to see through a deception

- Understanding an other's intentions and goals

- Openness within organisations

- Sharing what is not usually shared

- Being informed

- Having a shared understanding

- Being open to giving and receiving feedback

- Being forthright, especially regarding motives and reasons behind decisions

- Freely volunteering information

Researching on transparency in requirements engineering and enterprise information systems observed the following definitions that could be added to the prior list.

- The ability of stakeholder to answer their questions by using the information they obtain (Tu 2014);

- Timely disclosure of information (Madhavan, Porter, & Weaver, 2005; Pagano & Roell, 1996); and

- Sharing accurate and complete information (Granados, Gupta, & Kauffman, 2006; Bushman, Piotroski, & Smith, 2004).

- Intentionality shared information (Schnackenberg and Tomlinson 2016)

Mainly, transparency in organisations is concerned about making information about organisation visible to stakeholders. However, organisations also adopted transparency as a core value and embedded it in its culture and style of internal communications to improve relations between internal stakeholders. Internally transparent organisations are open to sharing information within and across departments and teams and from both top-down and bottom-up (Parris et al. 2016). An open culture of internal knowledge sharing results in employees being more motivated to engage in their job role which leads to an increase in their performance (Vogelgesang and Lester 2009). Employee engagement such as emotionally involved, committed and engaged at work, occur when they build a relationship between them and the workplace (Parris et al. 2016). Therefore, this kind of relationship makes employees feel well-informed about what is happening within the organisation.

2.2   SOCIAL TRANSPARENCY

As social media functionalities in digital devices and internet applications become more integrated into the workplace environment, Information about individual's identities and their

interactions become visible within and even across enterprise departments. This visibility has been conceptualised as social transparency in the literature of Computer-Supported Collaborative Work (CSCW), Situational Awareness, and Enterprise Management. (Stuart et al. 2012) defined social transparency as "the availability of social meta-data surrounding information exchange". They presented three social dimensions of information exchange that are visible across online applications: identity transparency, which refers to the identities of those exchanging, content transparency which refers to the changes to content exchanged and interaction transparency which refers to the actions taken during the interaction (Stuart et al. 2012). In work about visualisation of activity history in peer production context such as open-source software development, (Marlow and Dabbish 2015) point out to social transparency as the visibility of individuals' activity history which can help others to form an impression of this individual's area of expertise and to infer connections between individuals. They stated that the increase of transparency of individuals' actions in the online work context, there is a high potential for leveraging this information to start work relationships and to help recommend people for various tasks.

Social transparency can be practiced through the utilisation of enterprise social software platforms (ESSPs) such as weblogs, Slack, Yammer, and Workplace by Facebook. Kügler and Smolnik (2013) highlighted that collaboration, performance, knowledge management, innovation, and employee connectedness to be the areas benefiting most from social transparency of user-created contents (UCCs) in enterprise social software. They defined UCCs as any content shared by an employee, e.g., blogs, text messages, photos, videos, user profiles, and activity streams. Due to its positive impacts, social transparency is also considered in designing systems to support communication and collaboration among a large group of people over computer networks. (Erickson and Kellogg 2000) argued that making co-workers more visible and letting them aware when someone on the team acted on a joint project would encourage participation and promote collaboration work. They discussed three properties of socially transparent systems: *visibility* of social information that enables employees to be both *aware* of what is happening and to be *accountable* for their actions as a consequence of public knowledge of that awareness.

Studies in social transparency shows the advantages and benefits of the openness about social information amongst organisational members. However, the risks of social transparency have not received due academic attention and empirical examination. This research aimed to fill this gap in the literature.

This section provides several concepts and theories that used to identify the effect of social transparency on the workplace environment, such as self-determination theory, cooperative freedom theory, and situational awareness. Self-determination theory presents motivation from a psychology perspective. Cooperative freedom theory is a theory that illustrates the role of information disclosing in individual motivation to make autonomous decisions. Finally, situational awareness is a concept used to identify the transparency subjects that help individuals to be motivated to take action by being aware of the surrounding environment.

2.3.1 ORGANISATIONAL BEHAVIOUR

Organisations are simply defined as a group of humans who work independently toward a set of shared goals (Aswathappa and Reddy 2009). Individuals and groups who create an organisation have a structured pattern of interaction to accomplish specific tasks. It is generally known that organisational members seek to achieve their goals effectively. Organisational behaviour (OB) helps organisations and individuals in achieving their effectiveness in their activities (Aswathappa and Reddy 2009). Organisational behaviour refers to:

"The behaviour of individuals and groups within organisation and the interaction between organisational members and their external environments" (Bloisi et al. 2007).

OB is a field of study that explores the individual and group behaviour within organisation for improving organisation's effectiveness (Robbins 2001). According to (Aswathappa and Reddy 2009), OB is based on several fundamental concepts that revolve around the nature of humans and organisation. These fundamental concepts are:

- Individuals are different in their intelligence, physique, personality, diction, and any such trait. Thus, organisational management can bring motivation amongst employees by treating them differently.

- Organisational members are not separated from their social life. When individuals are appointed, their skills alone are not hired, their social background, likes and dislikes, pride and prejudice are also hired. Therefore, management should make the workplace a home away from home.

- Individuals' behaviours are caused, not random. Individual behaviour is directed towards someone that the individual believes or in his/her interests. For example, when an

employee arrives late to work or abuses the supervisor, there is a reason or causes behind that behaviour. Management must realise this behaviour and attempt to solve this issue at its root.

- Individuals in organisations want to be treated with respect and dignity. It was illustrated that individuals should be entitled to respect and recognition of their abilities and unique aspirations. This concept represents the ethical philosophy of OB. Since OB involve human, ethical philosophy involves in its actions too.

- Organisation is a social system that governed by social and psychological laws. Organisational members have psychological needs as well as social roles and status. OB is influenced by their groups as well as their individuals' drives. Therefore, the organisational environment described as dynamic change that its employees are subject to influence by others rather than a static set of relations as described in organisational chart.

- The relationship between organisation and people is described as mutuality of interest. People need an organisation to achieve their goals, and at the same time organisations need people to help attain organisational objectives. If there is a lack of mutuality, there is no sense to group people and develop cooperation.

- Organisations need a holistic concept that describes people-organisation relationship that provides a holistic view of people in organisation in order to understand the factor that influences their behaviour and analyse them in term of the situation affecting them rather than as isolated problems.

- Knowledge about OB used to help management to attain organisation objectives effectively and efficiently by planning, organising, and controlling organisational resources.

OB, as defined earlier, study human behaviour within organisations. (Aswathappa and Reddy 2009) illustrated that this concept comprises the study of the following subjects, as presented in Figure 4:

- Individual behaviour: this study covers aspects such as personality, attitudes, opinions, perception, learning, motivation, job satisfaction, and stress management.
- Interpersonal behaviour: this study includes group dynamics, team dynamics, group conflict, communication, and transaction analysis.
- Organisations: this subject covers organisational aspect such as their structure, formation, effectiveness, formal and informal organisations.

The organisational behaviour embraces these three subjects of study as complementary to each other's. It was illustrated that Individual behaviour will influence/ is influenced by group which in turn has an effect on the behaviour of organisations. The analysis of the individual is no longer more valuable than group behaviour and organisation formation. OB scholars recognise that behaviour in work setting is one of the complex topics that result from various interactive parties. (Aswathappa and Reddy 2009) stated that OB literature is common in using phrases such as "it all depends" or "under certain conditions" implying that certain behaviour is possible under certain conditions.
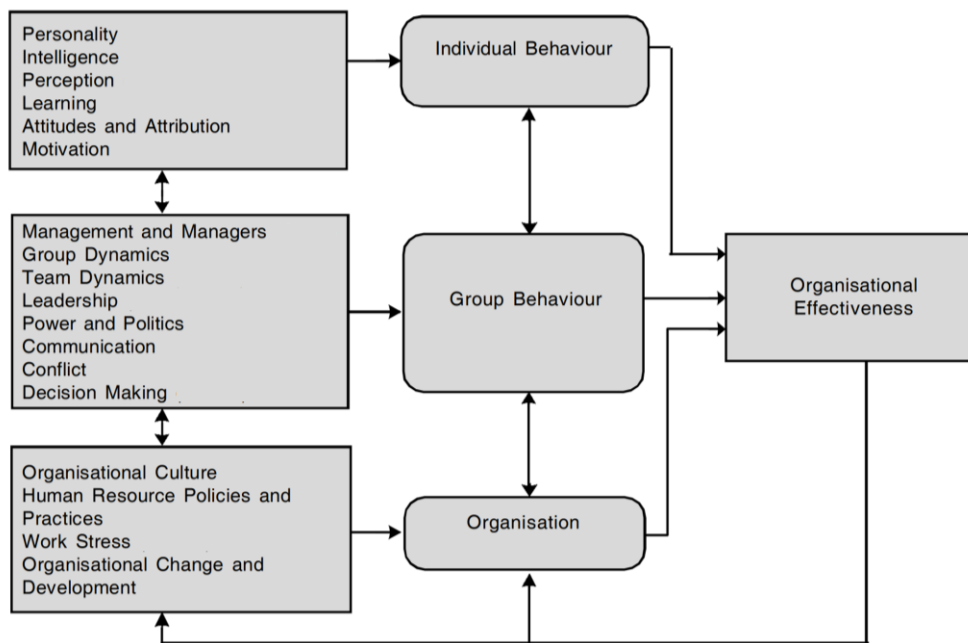
FIGURE 4: ORGANISATIONAL BEHAVIOUR MODEL (ASWATHAPPA AND REDDY 2009)

2.3.2   SELF-DETERMINATION THEORY

Self-determination theory represents a broad framework for the study of human motivation and personality. SDT has been applied across several domains, including parenting, education, healthcare, sports, and physical activity psychotherapy, as well as fields of work motivation and management (Deci et al. 2017). SDT suggests that both employees' performance and their well-being are affected by the type of motivation they have for their job activities. Therefore, Deci et al. (2017) illustrate that SDT distinguishes the types of motivations and maintains that each type has different triggers and consequences, as shown in Figure 5**.**
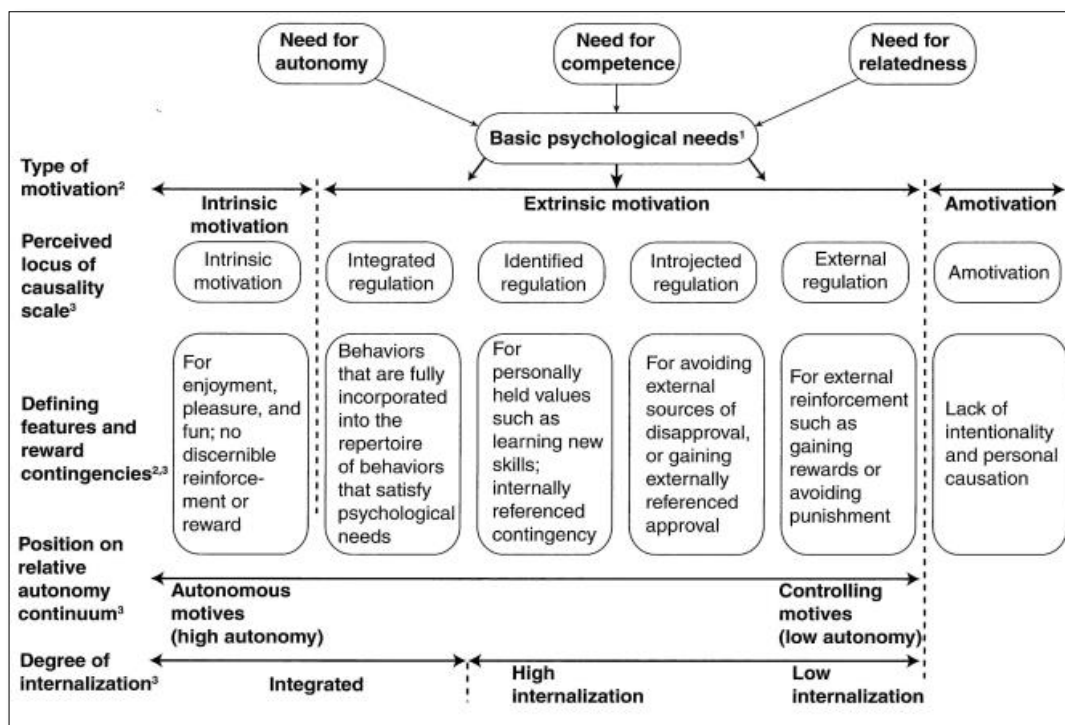
FIGURE 5: COMPONENTS OF SELF-DETERMINATION THEORY (SANLI ET AL. 2013)

2.3.2.1   AUTONOMOUS MOTIVATION

Autonomous motivation is characterized by people being engaged in an activity with a full sense of willingness, volition, and choice. Often, autonomously regulated activities are intrinsically motivated (Gagné and Deci 2005). Moreover, Deci et al. (2017) state that extrinsically motivated activities, not contingent on rewards, can be autonomously motivated. When individuals understand the worth or the purpose of their jobs, feel ownership and autonomy in carrying them out, and receive precise feedback and supports, they are likely to become more autonomously motivated and reliably perform better, learn better and be better adjusted.

2.3.2.2   INTRINSIC MOTIVATION

Intrinsic motivation is a specific type of autonomous motivation, and it refers to the engagement in activities because they are interesting or enjoyable (e.g., I work because it is fun). Employees can be intrinsically motivated to all or part of their jobs, and when individuals are intrinsically motivated, they tend to provide high-quality performance and wellness (Deci et al. 2017).

2.3.2.3   EXTRINSIC MOTIVATION

Extrinsically motivated behaviour involves doing an activity to attain separable consequences, whether tangible or verbal (Deci et al. 2017). Therefore, SDT differentiated extrinsic motivation

into various forms, which is recognizable in the workplace, and which range from being less to more autonomous (Gagné and Deci 2005).

External Regulation is the classic type of extrinsic motivation and is a prototype of controlled motivation. When externally motivated, Individual act to obtain desired consequenc4es or avoiding an undesired one (Gagné and Deci 2005). So, they are energised into action only when the action is instrumental to those ends (e.g., I work when the boss is watching).

Introjected regulation is a motivation that is triggered by pressuring voice. Deci and Ryan (2008) state that introjected regulation is a kind of autonomous motivation which is a controlled form of internalized extrinsic motivation (e.g., I work because it makes me feel a worthy person). Introjected regulation energized by factors such as approval motives, self-esteem, avoidance of shame, ego-involvement (Deci and Ryan, 2008).

Identified Regulation is a kind of internalized motivation that requires individual to indicate the value of behaviour for their selected goal (e.g., a person recognise that studying grammar for English class is an essential means to becoming a good writer). In this kind of motivation, the individual is not motivated because of the feeling of enjoyment, feeling shame or obtaining a reward; it is a recognition of the benefits towards personal development.

Integrated Regulation is the fullest internalized form of motivation. Gagné and Deci (2005) clarify that individuals who have full sense that the behaviour is self-determined because it emanates from their sense of self.

2.3.2.4   BASIC PSYCHOLOGICAL NEEDS

The fundamental idea of self-determination theory is the impact of varied environmental factors such as job design, managerial styles, and pay contingencies on the worker's motivations and functioning. Self-determination theory postulates that human motivations related to satisfying the human psychological need which are autonomy (feeling of being the origin of one's behaviour), competence (feeling effective) and relatedness (feeling understood and cared for by others). According to Silva et al. (2014), these three needs represent the psychological nutriments that are essential for psychological growth, integrity and well-being. Support and satisfaction of these needs provide the basis for the psychological energy that motivates healthy behaviour (Deci et al. 2017).

2.3.3   COOPERATIVE FREEDOM THEORY

The theory of cooperative freedom was published by Morten Flate in 1992 as a theory of autonomy and independence to support distance education. The main goal of this theory is to develop a distance education system that combines freedom for the individual with group cooperation. Freedom implies individual autonomy, while cooperation indicates group interaction and interpersonal dependency. Dalsgaard and Paulsen (2009) state that the theory is based on three pillars which are voluntary participation, individual flexibility, and affinity to the learning community. Learning is considered an active process that occurs through problem-oriented activities in which the students aim to solve a problem or achieving goals. Therefore, the theory of cooperative freedom is supported by a socio-cultural perspective, which emphasizes problem-based and self-governed activities(Dalsgaard 2006).

Volunteering is the cornerstone in the cooperative online education; the cooperation should be voluntary, but attractive and appealing. Paulsen (2012) points out that cooperation should be offered as an appealing opportunity for those who seek cooperation. The challenge, therefore, is to help individuals who are interested in cooperation to engage in a network of learners and learning resources. In the cooperative online education, students are stimulated to be visible and seen as potential partners and resources for others (Paulsen 2012). Therefore, transparent information could be a substantial cooperative recourse. The theory of cooperative freedom describes a range of possible freedom facets that might be available and shared among learners and tutors in a formal learning setting, as shown in Figure 6.

Transparency is vital for several cooperative contexts such as workers cooperative, learner cooperative, social cooperative. People can be stimulated to cooperate if they know or have access to information about each other. For example, cooperation in online education is a benefit when information related to the learners, and learning is available to the learning community. Examples of information include personal information about the learner or information related to work provided by students and teachers in blogs or discussion forums as well as information related to results of quizzes, surveys, and assignments.
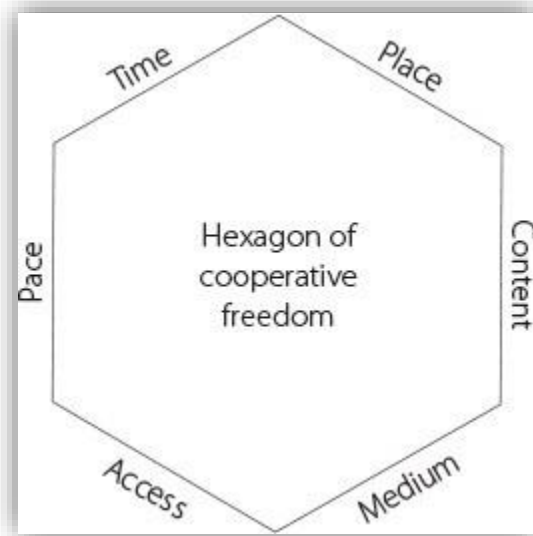
FIGURE 6: PAULSEN'S MODEL OF COOPERATIVE FREEDOMS (PAULSEN 2003)

Cooperative education can be organised in networking sites where each individual has a personal page and profile which the individual can update and modify. People can view these pages and follow the activities of others. Therefore, actions within networking sites are transparent. Dalsgaard and Paulsen (2009) indicate that transparency in networking sites creates a kind of passive form of communication where people need to update their profile, add pictures or text to communicate with others. This kind of communication takes place through subscribing to the personal page and then being aware of any action that performs on the page. It is a matter of awareness and transparency, as stated by (Paulsen 2012). Based on this, transparency is relevant within the cooperative environment, for example, in a cooperative business where individuals are working on related projects but they are not collaborating. Within a cooperative business, the challenge is to enable parties to follow the work of their co-workers. If the stakeholders are unaware of the activities of fellow stakeholders, they might not make use of each other.

2.3.4   SITUATIONAL AWARENESS

Situation awareness defined by Endsley (1988) as "the perception of the elements in the environment and events with respect to time and space, the comprehension of their meaning and the projection of their status in the near future". It is also a field of study concerned with being aware of what is happening in the surrounding environment to understand how information, events, and individual actions will impact goals and objectives. Endsley (1995) provides a specification of the three primary components of this definition (Figure 7):

- **Level 1 situation awareness: (perception of the elements in the environment).** This level identifies the key elements or "events" that define the situation, e.g. objects in the event's environment.

- **Level 2 situation awareness: (comprehension of the current situation).**
    - This level is a combination of level1 events into a comprehensive, holistic pattern. This level defines the status in operationally relevant terms in support of decision making and action.

- **Level 3 situation awareness: (Projection of future status).**
    - This is the projection of the current situation into the future to predict the evolution of the tactical situation (short term objectives).
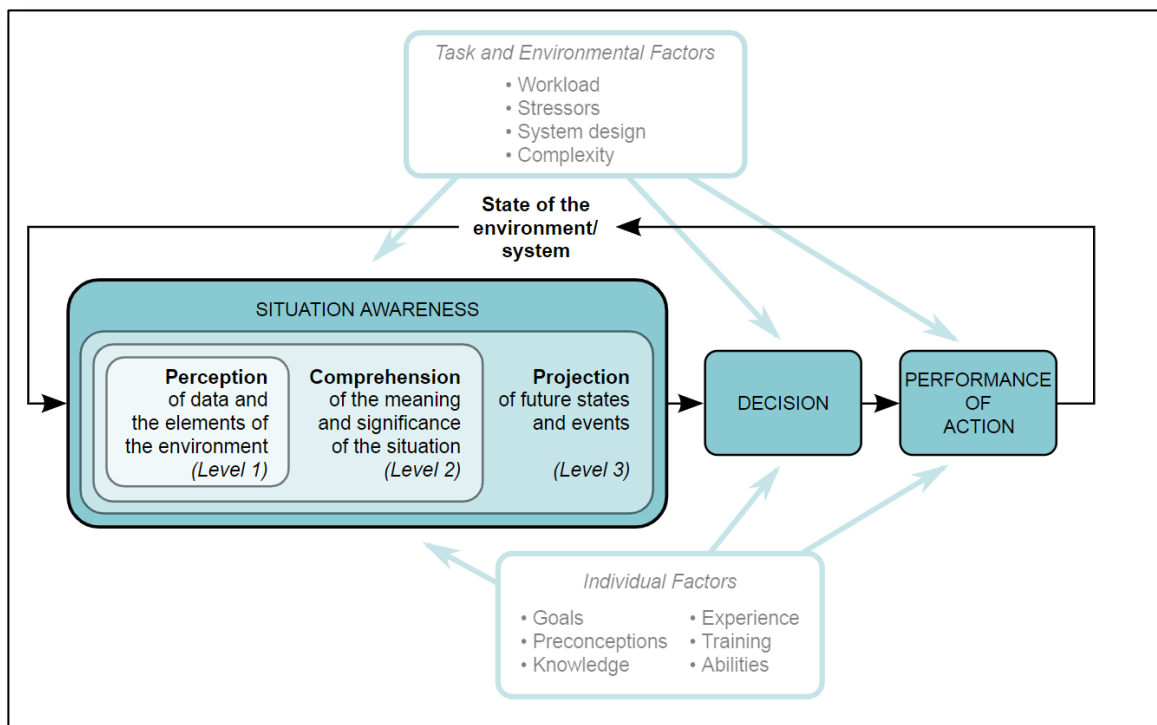
FIGURE 7: ENDSLEY'S MODEL FOR SITUATION AWARNESS

Similarly, some researchers viewed situation awareness as a part of cognitive activity, as illustrated in Table 1.

TABLE 1: DEFINITIONS OF SITUATION AWARENESS

Definition	Reference
• Perception of the elements in the environment within a volume of time and space; • Comprehension of their meaning; • Projection of their status in the near future.	(Endsley 1988)
• Estimate of the purpose of activities in the observed situation; • Understanding of the roles of participants in these activities; • Inference about completed or ongoing activities that cannot be directly observed; • Inference about future activities.	(Noble 1989)
Continuous extraction of environmental information, integration of this knowledge to form a coherent mental picture, and the use of that picture in directing further perception and anticipating future events	(Dominguez et al. 1994)
• Perceive the information; • Interpret the meaning with respect to task goals; • Anticipate consequences to respond appropriately	(Flach 1995)

2.3.4.1   TEAM SITUATION AWARENESS

In many systems and organisations, people work as members of a team. Thus, it is necessary to consider the SA of not just an individual but also the SA of the team. Team SA is defined as "the degree to which every team member possesses the SA required for his or her responsibilities" (Endsley, 1995). If any member of the team has insufficient SA, it can affect the performance that consequently threatens the success of the entire team. Therefore, each member of the team must have a high level of SA on the factors relevant to his or her job. It is not sufficient for one member of the team to be aware of critical information if the team member who needs that information is not aware. It is coined by Endsley and Jones (1997) as shared situation awareness.

2.3.4.2   SHARED SITUATION AWARENESS

Endsley and Jones (1997) defined shared situation awareness as "the degree to which team members possess the same SA on shared SA requirements". By this definition, there are

information requirements that are relevant to multiple team members. In low performing teams, two or more members may have different assessments on these shared requirements and thus, they behave in an uncoordinated or even counter-productive fashion. While in a smoothly functioning team, each team member shares a common understanding of what is happing on those SA elements that are common. Thus, not all information needs to be shared. Sharing every detail of each individual's job would only create a great deal of "noise" to sort through to get the needed information.

2.4   TRANSPARENCY AND RELATED EFFECTS

Social transparency, and lack of social transparency, introduces several effects, either positive or negative, to the workplace environment, each of which has been investigated in the literature. The following subsections briefly presented the studies that investigated the effect of online social transparency on individuals and groups within the workplace environment.

2.4.1   TRANSPARENCY AND SITUATIONAL AWARENESS

The link between online social transparency and awareness has been the subject of several studies in improving work in enterprises. (Erickson and Kellogg 2000) stated that digital systems are primitive and generally opaque to social information. They described individuals in the digital workplace as socially blind due to the limitations of knowledge about people and their interaction and situation. They stated that social transparency brings awareness to the surroundings and provides the basis for inferences, planning, and coordination of activity. Works on awareness found that notifying members of actions on shared artefacts has a role in maintaining mental model of others' activities (Gross et al. 2005) and avoid potential coordination conflicts (Sarma et al. 2003).

Researchers in computer-supported collaborative work (CSCW) have studied the effect of social transparency in awareness and consciousness about others' activities (Gutwin and Greenberg 2002; Bardram and Hansen 2004; Stuart et al. 2012). Transparency about changes in a particular piece of information is described as a dimension of social transparency in collaborative work (Stuart et al. 2012). They stated that social transparency of changes in information makes people aware of what is happening and when, where and how sources and receivers have changed information. Social transparency and its influence to be able to stay aware of others in real-time distributed systems have been shown to have an important role in the fluidity and naturalness of collaboration and reducing the characteristic of the awkwardness of remote collaboration (Gutwin

and Greenberg 2002). In context-aware computing, online transparency about information related to the current work context of a person, status, and location has been conceptualised as context-mediated social awareness (Bardram and Hansen 2004). This social awareness help to initiate a proper conversation between cooperating partners, engaging in cooperative work and minimising unwanted interruptions between mobile, distributed co-workers.

2.4.2   TRANSPARENCY AND COLLABORATION

Enterprise members are social creatures, and they can make inferences about others from what they observe in their work environments. Social transparency in digital work systems has been shown to have an impact on the collaboration amongst enterprise members. For example, (Dabbish et al. 2012) examined the value of social transparency in collaboration in knowledge-based work. They found that the social inferences that individuals made based on visible cues of others' behaviour fed into three types of collaborative activities: project management, learning through observation, and reputation management. (Kügler and Smolnik 2013) studied the behaviour of individuals in enterprise social software (ESS) and its effect on communication and collaboration amongst users. They stated that ESS helps individuals to perform their tasks more efficiently due to the conversation and collaborations with peers on the available social software tools.

It is important to know how online social transparency can help increase collaboration. (Dalsgaard and Paulsen 2009) argue that people can cooperate and collaborate if they know about each other and have access to some necessary information and services. They stated that transparency through online communication and collaboration tools support individuals' indirect sharing of resources, thoughts, ideas, productions, notes. This kind of social transparency can provide individuals with insights into the workings of others and thus, give them an increased consciousness and awareness of their activities. Research in crowdsourcing showed that when workers in a crowdsourcing system know that their answers and activities are visible to others, they work hard and collaborate with peers to avoid unjustly penalising to their peers due to their errors (Huang and Fu 2013b). (Dabbish et al. 2012) stated that transparency about certain properties of actions in ESS has a role in finding contributions opportunities or potentially problematic change that consequently increases the collaboration.

However, social transparency has the potential to hinder collaboration. For example, a study shows that excessive undesired transparency may inhibit collaboration and reduce the passion for engaging in group work (Palanski et al. 2011). In the enterprise management field, inaccurate

transparency in delivering information is unlikely to increase collaboration and improve individual behaviour in a way that desired by managers (Schaerer et al. 2018).

2.4.3   TRANSPARENCY AND MOTIVATION

One of the researched effects of social transparency is its potential to trigger motivation. McManus et al. (2007) stated that the level of transparency at which business strategy can be disseminated to employees would impact the organisation's performance on keeping employees motivated and engaged, which is essential in organisational performance. It was argued that making organisational goals and strategies visible and open to employees will make individual performance and contributions to the organisation more evident. Transparency about organisational strategies does necessary to be the only way to motivate employees. Transparency about the success of organisation can be a factor that also motivates employees, particularly when it aligned with the individual goals (McManus et al. 2007). When the organisation succeeds, the employees should also feel they have succeeded.

In terms of social transparency about individual information, Erickson and Kellogg (2000) discussed the idea of designing social systems for a workplace that allows co-workers to "see" one another and make inferences about their activities. It has been illustrated that making the activities of co-workers visible has the potential to encourage participation and promote collaborations. Other works by Huang and Fu (2013a) suggest that transparency about necessary demographics information in collaborative platforms motivates pair of workers to collaborate better than when they remain anonymous to each other.

Studies in crowdsourcing platforms such as Amazon's Mechanical Turk found that little or lack of social transparency regarding can lead to psychological distance and reduce motivation to help or perform better (Marlow and Dabbish 2014). Crowdsourcing platforms are used to collect data or perform tasks that need human judgment. In most crowdsourcing platforms, the identity of task requesters is anonymous and hidden from the workers, which can lead to uncertainty about who they are working for. This uncertainty has been seen as a factor in producing less passion and commitment to the task (Marlow and Dabbish 2014). Research in groups shows that lack of transparency about identities and lack of identity interchange significantly reduce collaboration, trust, motivation and increase free-riding (Granovetter 2005), social loafing (Aggarwal and O'Brien 2008) and tendency to withhold efforts (Piezon and Donaldson 2005).

2.4.4   TRANSPARENCY AND TRUST

One of the more-researched effects of providing social transparency in the workplace is its potential to restore trust and diminish reputational risk or damage (Bandsuch et al. 2008). The 2010 Edelman Trust Barometer was the first to include transparency and rank it seventh of 16 essential business attributes (Edelman 2012). Online social transparency has been studied in research that examined the effect of using social media in building social trust amongst peers. For example, Valenzuela et al. (2009) stated that using social networks enables individuals to develop norms of trust and reciprocity, which are necessary for engagement in collective activities.

Although the existing literature shows a link between online social transparency and trust, it is not clear what the specific factors that produce these effects. Kenski and Stroud (2006) illustrated that online transparency has a role in the fulfilment of the informational needs of users, which is essential for strengthening weak relationships and promote collective action. Hargittai (2007) reasoned that online platforms could keep users regularly updated about what is going on with their contacts. Studies in transparency in government field declared that the use of social media has recently become a trend in e-government. Using social media in government can be considered as a platform for the government to interact with citizens as a way to fulfil related open government policy goals such as transparency, participation and collaboration (Song and Lee 2016). Social media has several characteristics that enable more accessible to information through various devices, enable user-centred content, and provide visible social connections (Kaplan and Haenlein 2010; Näkki et al. 2011). Recent studies posit that citizens only trust their government when they disseminate information about what they do (Grimmelikhuijsen 2009). Therefore, social media helps citizens to be more informed of current government events, policies, or programs because it aims to increase public awareness of government data and process (Song and Lee 2016).

Several factors may weaken the link between social transparency and trust. One of these factors is the achievement of user expectations. The effect of social transparency in increasing the level of trust shown its effectiveness when this transparency corresponds with users' expectations and requirements. (Coleman and Coleman 1994) proposed a framework of social theory that articulates the role of information in building trust. It has been explained that three essential elements that may lead the trustor (e.g., citizen) to vest trust in the trustee (e.g., government): the chance of receiving gain, the potential loss, and potential gain. Another factor is the two ways transparency. Social transparency may use one-way communication, such as in the communication between the government and their citizen or management and their employees. (Näkki et al. 2011) links the

effect of enabling more direct, real-time and networked ways for people with a high level of trust and participation. It has been argued that people like to be informed as well as to be heard from.

2.4.5   TRANSPARENCY AND ACCOUNTABILITY

Accountability is one of the important effects of social transparency in several research areas. It is believed that social transparency, with its various meanings, facilitates accountability (Menéndez-Viso 2009). Several studies illustrate the link between social transparency and accountability. Rawlins (2008a) states that organisations that are intentionally volunteering information about their process, progress, or policies become more accountable for their actions because they became monitored by others. Social transparency has been used as a mechanism of corporate accountability. For example, Williams (2000) points out that the concept of corporate social transparency is based on the idea that public members should have consistent, high-quality information available about the social, political and environmental effects of corporate actions locally and around the world. It was illustrated that most companies that disclose information about their product and their domestic and global environmental effects start to reduce their toxic releases. Williams (2000) mentioned that corporate social transparency is a process of self-reflection which leads to accountability; it was termed as "social accounting".

In terms of Computer-Supported Collaborative Work (CSCW), scholars investigate the effect of social transparency in accountability on collaborative systems. For example, Wikipedia is one of the collaborative knowledge building that allows virtually anyone to add content and change the content that others have added. Wikipedia community enables visibility of contributors' changes to subsequent visitors. However, the articles in Wikipedia are still viewed with scepticism in their quality, accountability, and trustworthiness. Suh et al. (2008) illustrate that the visibility of hidden editing information such as the history of the writer which represents a form of social transparency has been an essential factor in encouraging the writer to be more responsible. IBM has developed a tool that visualises the edits to articles in Wikipedia to support the reader's decision-making in the quality of the content and increases the writer's accountability. In addition, designing systems with strong identity transparency include real names and information about sender and receivers attributes such as personal demographic acts as a signal to trust in each other and willingness to be accountable for what they share and disclose publicly (Stuart et al. 2012).

Some scholars raised many reasons which made them question the direct effect of social transparency on accountability. They argue that it is not necessary that social transparency can

produce accountability. Hale (2008) states that accountability is a principle that has two dimensions: the ability to know and the ability to make someone do other things, and transparency and revealing social information can bring the first dimension but not the second dimension. (Shkabatur 2012) states that the demand for accountability is satisfied by mandatory transparency. He argues that the existing transparency policies do not strengthen accountability, and the technology has also reinforced the pitfalls of transparency policies. He illustrated that the current technologies for online transparency enable organisations to withhold some information that might be essentials for public accountability. Another reason is the intermediary concept between transparency and accountability. (Naurin 2006) states that publicity is the causal link between transparency and accountability. Transparency has been described as the ability to look at something and investigate it while publicity is the dissemination of information to reach stakeholders. (Naurin 2006) illustrates that lack of mediators (e.g., social media), lack of demand and lack of accessibility to information may lead to reduce publicity and as a result, lack of accountability.

2.5   CHALLENGES IN DESIGNING SOCIAL TRANSPARENCY

As the previous section suggests, social transparency can, in some instances, be a positive addition to the enterprise information systems. However, Information is power, and this power can be abused to gain benefits. Social transparency is a complex and multi-faceted term, which provides substantial room for manipulation and circumvention. Kolstad and Wiig (2009) provide the following challenges to be thought of in designing transparency in general and it can be applicable with social transparency:

- **Secrecy:** withholding information from specific stakeholders
- **Opacity:** Obscuring the information and make it difficult to understand by stakeholders
- **Wrong information:** providing wrong information to mislead stakeholders in their decision making
- **Biased information:** providing information based on personal judgments
- **Spinning:** providing information to specific stakeholders with a particular emphasis that favours information providers
- **Incomplete information:** Providing information to stakeholder that hide part of the truth in order to mislead them

- **Inaccessible information:** availability of information that is difficult to be accessible by some stakeholders

- **Unequal access to information;** providing different stakeholder with different amount and level of information

- **Information overload:** providing stakeholders with unrequired, unneeded information that makes them unable to detect the relevant information

- **Irrelevant information:** providing information that does not relate to stakeholders' needs, purposes, requirements.

2.6 APPROACHES TO ASSESS TRANSPARENCY

With various peculiarities of the concept of social transparency in enterprise and the vagueness that exist between areas the useful transparency and problematic transparency, it is logically expected why some researchers emphasised the need for approaches that assess transparency. It has been already noted that the literature lacks a systematic approach to assess transparency (Stuart et al. 2012) and lacks a metrics and measures designed for transparency in enterprise, while researchers need to propose one (Abu-Shanab 2013). Griffith (2006) states that systems designers of organisational websites should go beyond the traditional meaning of transparency that can be met by making the information available to those who need them. The need for new criteria for transparency has been emphasised to meet users' requirements in the new version of society that appetite for information.

In the empirical study literature, several studies have been conducted to assess and evaluate the concept of transparency. do Prado Leite and Cappelli (2008) handled the problem of software transparency using the idea of non-functional requirements that need to be understandable and readable for both general stakeholders and software developers. Hence, they proposed a measure for achieving useful transparency by identifying its relations with other non-functional requirements such as accessibility, usability, informativeness, understandability, auditability. An argumentation framework was proposed as a formal approach to capture transparency-related requirements (Serrano and do Prado Leite 2011). The framework is supported by a language and transparency catalog. They use the language to model argumentation graphs that represent stakeholders' arguments and their conflicts, preferences and inferences about transparency related NFR. When there is a consensus about these requirements, it is inserted as a requirements pattern in the catalog. Tu et al. (2011) designed a survey to find an effective and efficient way to measure and control the level of transparency in software development processes. Three attributes were

identified in the survey to evaluate the level of transparency: accessibility, relevance and understandability. The survey aims to identify the problems that may occur amongst stakeholders who involve in the development of software systems. The need for evaluating and assessing transparency was the driver for producing four reference models designed to act as foundations for methods which manage transparency so that information is delivered and presented in a meaningful and useful way to the appropriate audience (Hosseini et al. (2018b). (Hosseini et al. 2016b, 2018a) proposed TranspLan as a modelling language to capture transparency requirements in business information systems. They designed models and templates to identify transparency requirements within organisations and proposed algorithms to reason the consistency and conflicts in the captured requirements.

Although the literature in online transparency is fragmented and still underdeveloped (Grimmelikhuijsen and Welch 2012). Scholars interested in assessing computer-mediated transparency (online transparency) have focused on the content of transparency in the websites. For example, a Website Attribute Evaluation System (WAES) has been developed by Cyberspace Policy Research Group and has been used in various research to capture the content of transparency in organisational websites. Some scholars used (WAES) to capture the content of transparency in terms of online availability and technical accessibility (Pina et al. 2007). Focusing on another dimension of online transparency, (Drew and Nyerges 2004) proposed criteria that can be used to assess seven objectives of transparency in decision making: accessibility, integration, clarity, logic, accuracy, openness and accountability. Some approaches of assessing internet-based transparency are based on assessing information quality characteristics such as timeliness, understandability, completeness, relevance, comparability and reliability (Bolívar et al. 2006; Caba Pérez et al. 2008). Moreover, an assessment model has been developed to assess online transparency with the focus on three attributes which are visibility, format and delivery mode (Lourenço et al. 2013). They stated that these attributes directly related to information transparency and which are used as essential criteria to assess the information presented in the online websites.

Most of the efforts reported in the literature to assess and evaluate online transparency focus on the quality aspect of transparency, such as free from pretence or deceit, easily detected, apparent and readily understood. We argue in this thesis that being open and honest may not be enough to be transparent. In real life, people may share information and that information may not readily understood, then they decided to explain more. In this thesis, we explore a different aspect of

transparency which is about explaining reasoning and intentions behind the information shared or actions made. We defined this, in Chapter 1, as social transparency when people are autonomously open about their intentions which underlies any statement they said or action they have done.

2.7 GOAL ORIENTED REQUIREMENTS ENGINEERING

The essential indicator of the success of a software system is the extent to which it meets its purpose. Therefore, identifying the purpose of the software system is one of the main activities in its development phase. In addition to identifying the purpose, identifying system requirements also have a significant impact on the quality of the software system. Requirement engineering (RE) is a branch of software engineering that deals with elicitation, refinement, analysis of software system requirements (Lapouchnian 2005). There are several definitions of requirements engineering from academia as well as from industry. Book (2010) provides one of the definitions of requirement engineering; it defined as "*The branch of software engineering concerned with the real-world goals for, functions of, and constraints on software systems. It is also concerned with the relationship of these factors to precise specifications of software behaviour, and their evolution over time and across software families*". As described by (van Lamsweerde 2004b), Requirements engineering covers seven activities: Domain analysis, elicitation, negotiation and agreement for the best alternative requirements, specification of the requirements, specification analysis, Documentation and evolution.

Requirement engineering is viewed as a process of two phases. The early phase emphasises the analysis and modelling of the environment for the system-to-be, the organisational context, the stakeholders, their objectives and relationships (Castroa et al. 2001). It has been noted in various research that a proper analysis of the domain is essential for the success of the system. As indicated by Lapouchnian (2005), understanding the objectives and motivations of stakeholders and analysing their social relationships helps in identifying the precise requirements for the system – to-be. The late requirement phase concentrate on modelling the system with its environment. Castroa et al. (2001) state that analysts in this phase identifies and adjusts the boundaries of the system and its environment, also identifies the system requirements and assumptions about the environment and determine the optimal configuration of the system and its environment to achieve the stakeholders' goals. System requirements can be functional requirements and non-functional requirements. Functional requirements define the functions that the system is supposed to accomplish, and non-functional requirements (which known as quality requirements) represent the criteria that can be used to judge the operations of the system (Pohl 2010). Although Non-

functional requirements are essential in the success of the system, there is no consensus on the nature of NFRs and how to elicit, document and validate them (Glinz 2007).

From the requirements engineering perspective, transparency is viewed as a non-functional requirement for a software system that helps to disclose information to stakeholders. For Cappelli et al. (2007), transparency in the business process could be achieved by a set of non-functional requirements. Moreover, the existing notions of transparency in requirement engineering are associated with diverse non-functional requirements, as discussed by Prado et al. (2010). Therefore, when Organisations set their goals and objectives, they consider transparency as a complement requirement to enhance other functional and non-functional requirements.

Goal-oriented requirement engineering (GORE) is concerned with the use of goals for eliciting, elaborating, structuring, specifying, analysing, negotiating, documenting, and modifying requirements (Van Lamsweerde 2001). Goals may refer to functional concerns or quality attributes. Modelling of goals has been used in different requirements engineering activities mentioned before. Examples of these models are Goal-based workflow (Ellis and Wainer 1994), *i** (Yu 2001), KAOS (Dardenne et al. 1993), GBRAM (Anton 1996a), NFR framework (Mylopoulos et al. 1992). In this research, our analysis is based on goal-oriented requirements engineering (GORE) mindset (Yu and Mylopoulos 1998). This is because transparency is mainly about personal status, intentions, goals, plans, tasks and social inter-dependencies, all of which are essential constructs of this paradigm in information systems analysis and design methods.

2.8   COMPUTER SUPPORTED COLLABORATIVE WORK (CSCW)

Computer-supported collaborative work (CSCW) is the name of the research area that studies the use of computing and communication technologies to support group and organisational activity. Computer-supported collaborative work is an interdisciplinary field of research that entails some combination of computing and social science such as combining artificial intelligence, network communication, distributed systems, user-interface design, usability with psychology, sociology, anthropology, organisational theory. Baecker (1993) is one of the books that organise collections of readings from the research literature of computer-supported collaborative work, the author states that there are two viewpoints adopted in CSCW research. The first viewpoint is technology-centric, which emphasis designing computer technology to better support the requirements of cooperative work. The second viewpoint is work-centric which emphasis understanding the work process to better design computer technology to support group

work. A multi-user software that supports CSCW systems is known as Collaborative software or groupware

Computer-supported collaborative work refers to the name for the research field, and there is the term "groupware" for the technical systems which result from CSCW research and development. The goal of the groupware system is to assist a group of users in communicating, collaborating, and coordinating their activities. Ellis et al. (1991) state that groupware is a "computer-based system that support groups of people engaged in a common task or goal and that provide an interface to a shared environment". Groupware can include hardware, software, services or group process support. The core characteristic of groupware is the non-separation of users from each other. Koch and Gross (2006) point out that groupware explicitly provides awareness of the co-worker and their activities and does not isolate the users from each other. They see the notion of transparency is the key to this awareness, which means each user should be aware of what the others are doing to facilitate coordination or collaboration.

2.9 RISKS MANAGEMENT IN ENTERPRISE

Managing risks is a fundamental concern in most of the dynamic global environments. Recently, enterprise risk management (ERM) has occurred as a holistic paradigm to view and manage an organisation's risks. It was widely argued in the literature that the implementation of an enterprise risk management has a remarkable role in improving enterprise performance and productivity (Barton et al. 2002; Nocco and Stulz 2006; Hoyt and Liebenberg 2011). The link between ERM and an organisation performance and value is noted in the definition of ERM, provided by (Committee 2003)

"ERM is the discipline by which an organisation in any industry assesses, controls, exploits, finances, and monitors risks from all sources to increase the organisation' short-and long- term value to its stakeholders."

One of the most popular definition of ERM in the literature, (Beasley et al. 2006; Moeller 2007) , is the following definition provided by the Committee of Sponsoring Organisations of the Treadway Commission (COSO),

"Enterprise risk management is a process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed

to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives."

According to the executive summary of COSO (Commission 2004), an organisation's ERM system should be designed to achieve the following objectives: (i) strategy: supporting the organisation mission by identifying high- level goals, (ii) Operation: using the organisation's resource efficiently and effectively, (iii) Reporting: designing reliable organisation's reporting systems and (iv) compliance: organisational compliance with applicable laws and regulations.

The literature has several works that developed a framework for ERM that meant to suggest an appropriate ERM system for a particular organisation. Researcher recognised that the ERM system is likely to vary from firm to firm (Gordon et al. 2009). Therefore, there is no universally ideal design of ERM systems has been suggested. One of the attempts to develop a framework for ERM systems was introduced by (Lai and A Samad 2010). The proposed framework consists of 14 implementation elements considered to be relevant and essential to define the intensity, maturity and penetration level of ERM systems. The 14 implementation elements cover 7 essential aspects of ERM implementation, namely,

1. ERM definition
2. Effective communication of risks and responsibilities
3. Philosophy of ERM
4. Risk identification and response
5. Compliance
6. Risk quantification
7. Performance measurement

The following are the 14 implementation elements in the ERM framework:

1. Provides a common understanding of the objectives of each ERM initiative
2. Provides common terminology and set of standards of risk management
3. Provides enterprise-wide information about risk
4. Enables everyone to understand his/her accountability
5. Integrates risk with corporate strategic planning
6. Integrated across all functions and business units
7. ERM strategy is aligned with corporate strategy
8. Aligns ERM initiatives to business objectives

9. Provides the rigor to identify and select risk responses (i.e. risk- avoidance, reduction, sharing, and acceptance)

10. Reduces risk of non-compliance

11. Enables tracking costs of compliance

12. Quantifies risk to the greatest extent possible

13. Identifies key risk indicators (KRIs)

14. Integrates risk with key performance indicators (KPIs)

2.9.1 RISKS IDENTIFICATION

It is commonly recognised that the risk identification stage of the overall risk management process has a significant impact on the accuracy of the construction of the risk assessment process. (Chapman 1998a) argued that this stage requires some form of judgment from someone who has managerial roles. They illustrated that this form of judgment is highly essential in the overall accuracy of the risk management process and any contributions to the effectiveness of the project management process. These judgments are predominantly influenced by personal opinions (i.e., subjective). Therefore, the methodology for collecting the data for the risk identification stage holds the key to assuring that the collected data is the best possible and essential for the risk management process (Tchankova 2002). According to (Chapman 1998a), there are several risk identification techniques grouped into three classifications: (1) risks identified solely by the risk analysts, (2) risks identified by interviewing a member of the project and (3) risk identified by conducting a group working. This thesis follows the group working technique to identify the risks of social transparency and to obtain an accurate judgment on the risk impact. The risk identification techniques that based on the working group are:

2.9.1.1 *BRAINSTORMING TECHNIQUE*

This identification technique involves redefining the problem, generating ideas, finding possible solutions, and developing feasible solutions and conducting evaluation (Chapman 2001). Brainstorming proposed by (Osborn 2012) as a problem-solving technique that produces a large number of ideas in less time in the existing group working techniques. (Osborn 2012) argued that the effectiveness of brainstorming technique is influenced by (1) social facilitation which refers to the generation of ideas by group thinking is more individual thinking because the generation of suggestions triggered by suggestions voiced by other members and (2) the reinforcement where

appropriate suggestions are reinforced by rewards in the form of receptiveness or suspending criticism. The steps of brainstorming techniques as proposed by (Hicks 2004) are as follows:

- Pre-meeting with the problem-owner to define the problem, determine its suitability and discuss what constitutes an acceptable solution
- The warm-up session, which may include problem redefinition in its later stages
- Brainstorming session incorporating additional techniques: Wildest Idea, Checklists and Attribute Listing as appropriate
- The subsequent acquisition of ideas
- Selection of most promising ideas
- Development of selected ideas
- Verification and presentation of selected ideas.

(Osborn 2012) stated that based on experience that the size of a group in a brainstorming session is 12 and it should involve leader, five core members, and five guests. Prior to starting the brainstorming session, the problem investigated has to be made particular, not general (Chapman 2001). It was declared that failure to narrow the problem could diminish the outcome of the brainstorming session (Chapman 2001). Zainol et al. (2012) have provided a list of problems in which the brainstorming technique is unsuitable. For example, problems that require a high level of technical expertise, problems include manipulation and people motivation, problems that need written materials to be created or considered.

2.9.1.2 NOMINAL GROUP TECHNIQUE

Nominal group technique derived from social-psychological research and management science studies (Potter et al. 2004). This technique was described the activities of NGT as an activity between a group of seven and ten members. They start writing the ideas on papers without discussion between them. After approximately 5 or 10 minutes, each member briefly presents one of the ideas and recorded in board in full view of all members. Round-robin continues until all members state that there are no more ideas to present. Discussion start when all ideas are presented, and members then start to evaluate the most serious risks individually. Then, these individual evaluations aggregated mathematically to present a group decision. The steps of nominal group decision are summarised by (McMillan et al. 2014) as follows:

1. Silent generation of ideas in writing
2. State a single idea from one participant at a time in Round-robin fashion

3. clarification and evaluation of each recorded idea through group discussion

4. Prioritising and ranking ideas based on group discussion.

It was stated that the silent production of ideas, the round-robin listing and following discussion and individual voting all have a role in increasing individual participation (Potter et al. 2004). it overcomes the shortcomings of the previous technique (brainstorming) which fails to resist the influence of a few individuals who dominate the ideas production and discussion (Harvey and Holmes 2012). In contrast to the problem-solving method in brainstorming techniques, groups in the NGT confronted openly disagree and attack others' ideas more frequently during the round-robin phase (McMillan et al. 2016). Therefore, Harvey and Holmes (2012) studied these points and promoted a more positive approach to this process. It was stated that this technique has more structured implementation than a brainstorming technique, but it is less influenced by the disagreement between different disciplines which existed before the beginning of the risk study.

2.9.1.3   DELPHI TECHNIQUE

Delphi is the most known method to collect group judgments in forecasting and estimation (Graefe and Armstrong 2011). This technique developed by Dalkey, Helmer, and others preliminary for technological forecasting (Dalkey 1967; Helmer-Hirschberg 1967). (Chapman 1998a) defined the Delphi technique as

"a method for the systematic collection and collation of judgments from isolated anonymous respondents on a particular topic, through a set of carefully designed sequential questionnaires interspersed with summarised information and feedback of opinions, derived from earlier responses."

Hsu and Sandford (2007) suggested that in order to conduct a Delphi technique, at least three groups are required to play different roles:

- **The decision-maker (s):** Individuals who expect specific outcomes from conducting the method for their purposes.

- **A staff group:** the facilitators who design the initial questionnaire, summaries the returns, and redesign the follow-up questionnaires.

- **A respondent group:** individuals whose judgments are being sought and who are required to respond to the questionnaires.

The fundamental principles of the Delphi technique as provided by Yousuf (2007) are (1) the elimination of direct social contact that provides unattributed contributions, (2) the provision of feedback and (3) the opportunity for revising the opinions. In this technique, participants are asked individually, usually by mailed questionnaires and recently by interactive computer contact, to estimate the variables in the questions. These are then collected and combined in a way that conceals the origin of individual estimates. The results are circulated between participants in case they wish to revise their earlier forecasts. These rounds continue until they reach a stable estimation. However, in practice, the process rarely goes beyond a second-round (Hsu and Sandford 2007). Thangaratinam and Redman (2005) provided the following peculiarities of the Delphi technique:

- No limit for the number of participants in the Delphi method. The number of participants depends on the number of respondents required to constitutes a representative pooling of judgment and the capability of the design team to process the information.
- The anonymity and identity concealing provide freedom from peer pressure. The method has an advantage in reducing and avoiding attenuation of performance that may stem from social interaction and overcome the problem of the dominant group.
- Due to the isolation of participants, characteristics of group members such as a background in terms of their profession does not consider an issue. Lack of contact with group members avoids the occurrence of such an issue.

On the other hand, Franklin and Hart (2007) provided four issues that may reduce the attraction to the Delphi technique.

- In this technique, lack of social-emotional rewards in solving problems may lead to the feeling of detachment from the problem-solving effort.
- Due to lack of verbal clarification or comment on collected feedback create difficulties in communication and interpretation amongst participants.
- Participants may not know to whom they are reporting their ideas and how to express them in a language that will be understood.
- Conflicts in ideas are handled by group judgment. Thus, while this activity identifies group priorities, conflicts are not resolved.

2.9.2   RISKS ASSESSMENT

Risk assessment is a process of defining and describing risks by characterising their probabilities, frequency of occurrence, severity, and evaluating their adverse consequences such as potential loses and harms (Ramesh et al. 2017).   Another description of risk assessment provided by Ebrahimzadeh et al. (2011) is the systematic identification of hazards associated with an activity and evaluate the level of risks for each hazard. We discussed in the above section the risk identification and its role as a significant step in the risk management process. Risk assessment is another crucial step that determines the qualitative and quantitative estimation of risks related to a well-defined situation and recognised hazards (Ramesh et al. 2017). The qualitative type of risk assessment refers to the estimation of risk probability based on known risk information applied to the circumstance being considered. The quantitative risk assessment is a subjective process based on personal judgments supported by general risk data.

Aneziris et al. (2008) described risk assessment as "a thinking process which enables managements of determined priorities and allocates resources in a way which will better control or eliminate risks to health and safety at work". In this direction, business intelligence (BI) is one of the new innovative tools to support risk assessment. Business intelligence, defined as follows:

"BI systems combine data gathering, data storage, and knowledge management with analytical tools to present complex internal and competitive information to planners and decision-makers." *(Negash and Gray 2008)*

This definition implicit the idea that BI systems provide actionable information delivered in the right form to assist decision-makers. It is illustrated that BI systems aim to improve the timeliness and quality of data inputs to the decision process, hence facilitating the managerial work. In some works, BI systems refer to online decision making that provides instant response to decision-makers (Negash and Gray 2008). It is explained that BI systems make the information useful and available instantly to decision-makers when the decision time comes. The use of BI systems is viewed as a proactive process (Negash and Gray 2008). Langseth and Vivatrat (2003) provided the following essential components of BI systems:

- real-time data warehousing,
- data mining,
- automated anomaly and exception detection,
- proactive alerting with automatic recipient determination,

- seamless follow-through workflow,
- automatic learning and refinement,
- geographic information systems
- data visualization

BI systems can convert raw data into useful information and then, through human analysis, into knowledge. Negash and Gray (2008) stated that by using BI systems, decision-makers could (i) predict future directions based on historical data, past and current performance, (ii) analyse the impact of specific changes and alternative scenarios and (iii) provide ad-hoc access to the data to answer specific and non-routine questions.

2.9.3   GOAL-ORIENTED RISKS ANALYSIS

Requirement completeness is one of the most critical challenges of system requirements engineering (Cailliau and Van Lamsweerde 2012). It was argued that poor risk analysis at requirement engineering phase leads to missing certain requirements and thus, system failure. Incompleteness often results from a lack of expectation and prediction of unexpected conditions under which the systems behave adequately. it was explained that the tendency to conceive over ideal systems might prevent identifying properly adverse conditions through appropriate countermeasures (Cailliau and Van Lamsweerde 2012).

Risk analysis should thus be a fundamental step in the requirement engineering process (Boehm 1991; Van Lamsweerde 2009; Lund et al. 2010). A risk is defined as *"an uncertain factor whose occurrence may result in some loss of satisfaction of some corresponding objective" (Cailliau and Van Lamsweerde 2012).*

The risk has a likelihood of occurrence and several uncertain consequences that are likely to stem from the occurrence of this risk. A consequence has a severity in terms of loss or satisfaction of corresponding objectives such as safety hazards (Leveson 2002), security threats (Van Lamsweerde 2004a) or inaccuracy conditions on software input/output variables (Van Lamsweerde and Letier 2000). At the requirement engineering phase, risks can be systematically identified and assessed from prescriptive requirements and descriptive domain properties (Van Lamsweerde and Letier 2000).

In a goal-oriented requirement framework, obstacles present a natural abstract of risk analysis (Kavakli and Loucopoulos 2003; Rifaut 2005). An obstacle to a goal is described as a precondition

for the non-satisfaction to the goal (Cailliau and Van Lamsweerde 2012). The analysis process of the obstacles (in some works, risk) described by (Van Lamsweerde and Letier 2000)as follows:

1. Identify the potential risk for each leaf goal in the goal model graph from relevant domain properties.
2. Assess the likelihood and severity of each risk.
3. Resolve critical risks by systematic risk reduction tactics such as reduce risk likelihood, avoid risk, reduce risk consequences, mitigate risk consequences.

Unfortunately, in some cases, risk reduction and mitigation require the revision of initial requirements. The idea is to analyse risks along with stakeholders' needs and to provide risk-based criteria for choosing amongst alternatives to fulfil requirements. Based on Goal-Oriented Requirement Engineering (GORE), analysis of stakeholders' goals leads to a set of functional requirements that can be evaluated for non-functional requirements posed by those stakeholders (Asnar et al. 2011). Therefore, there have been several attempts to consolidate risk analysis with requirements analysis (Cornford et al. 2006). KAOS (Dardenne et al. 1993), $i*$ (Yu 2011), GBRAM (Anton 1996b) and Tropos (Bresciani et al. 2004) are the most famous examples of GORE approaches and frameworks. Dardenne et al. (1993) proposed KAOS, a goal-oriented framework and introduce the concept of obstacle and anti-goal in order to analyse failure situations of design. Obstacles described as a condition that leads to goal failure (i.e., unintended risk) while anti-goal present goals associated with malicious stakeholders such as attackers (i.e., threat or intended risk). Van Lamsweerde and Letier (2000) proposed a collection of technologies that derive risk systematically from goals and domain properties. Mayer et al. (2007) extended the i* goal model with assets to analyse risks of security issues during requirements analysis. These assets include business goals and the architecture of its IT systems. Liu et al. (2003) proposed a methodology framework based on $i*$ goal model to analyse the security issue in their natural social context. The proposed framework lead to explore alternative designs and evaluate them based on their threats, vulnerabilities and countermeasure. Sabetzadeh et al. (2011) proposed a quantitative assessment approach based on the notion of goal-based assurance to ensure that new technology can be deployed in a safe, reliable and environmentally friendly manner. The proposed approach supported by a tool that includes three main components: (i) goal model, (ii) expert's elicitation and (iii) probabilistic simulation. They used KAOS goal modelling annotation to present and decompose a technology's goals.

2.9.4   RISK-BASED DECISION MAKING

As discussed earlier in section 2.9.2 that most business intelligence tools have been utilised to support decisions in risk management. Using computer-based tools for risk-based decision making has been widely researched in information systems literature as decision support tools. Risk-based decision making is defined as

"the process of identifying and ranking risks, to determine which are critical and above the organisation's tolerance or threshold and thus require attention, and then to select the risk management actions to take in response" (Wu et al. 2014)

Perkins (2015) stated that the steps of risk-based decision processes are similar to the risk management process, including (risk assessment, determination of risk likelihood, characterisation of risk factors, risk prioritisation and lastly, risk decision). Regine Hamelijnck (2013) declares that risk-based decision-making approaches assist managers in making decision-based on the risks that exist in their organisations or their environment. They provide several principles that are necessary for effective risk-based decision making in safety management and the attributes of the data utilised in such a decision-making process. According to Perkins (2015), making a decision based on risk on which a risk management action implemented on the prioritised risk are:

- **Avoid the risk:** stop performing or undertaking the risky activity,
- **Accept the risk:** the risk does not require mitigation,
- **Share the risk:** it refers to transferring the risk which means outsourcing the risky activity or obtain insurance for the cost of risk consequences,
- **Mitigate the risk:** it referred to reducing the risk by taking actions that reduce the likelihood of risk occurrence or reduce the magnitude of its consequences.

There are several examples in the literature about approaches that developed to support risk decision making. For example, Warenski (2012) used artificial intelligence to provide an application to analyse risk related to the loan systems. Otim et al. (2012) provided a recent analysis approach that evaluates the value and risks in information technology investments. They illustrated that such investments involve a complex set of stakeholders, which leads to consider organisational politics. (Silvestri et al. 2012) provided a multiple criteria risk assessment technique to analyse safety-related risks in manufacturing environments. Similarly, Lakemond et al. (2013) developed a method to assess risks in product development that enable early assessment of risks and other challenges.

2.10   INFORMED DECISION MAKING IN REQUIREMENTS ENGINEERING

Requirement engineering (RE) is a crucial activity in software engineering and it can be organisational activity or project activity. It is an organisational activity in terms of making decisions on what sort of requirements will go into products and the final requirements that will be released. It is a project activity when it comes actually to implement the requirements (Aurum and Wohlin 2003). These activities of requirements engineering involve several decisions that have to be made to ensure effective organisational and project decisions. Decision making in the requirement engineering process is far from straightforward. It involves the difficulties that characterize the decision-making process in other natural settings, e.g., dynamic environment, ill-defined goal or values, time stress and multiple players (Alenljung and Persson 2006). This implies that decision-makers in the requirement engineering process need decision support. In order to assist decision-makers in RE and to increase the effectiveness and efficiency of decision-making activities in RE, several aspects need to be addressed such as identifying the stakeholders who participate in the requirement engineering activity and accordingly consider specific decision aids for each type of stakeholders, identifying the information needed in each phase of the requirement engineering, as well as providing decision support tools (Aurum and Wohlin 2003). A support tool is useful about the characteristics of the target users, the tasks that are supposed to be done and the context in which the system is going to be used. The target users in the decision-making process of RE are the requirements engineers. There is a range paradigm for software engineering decision support that emphasis on providing a methodology for generating, evaluation, prioritizing and selecting of solution alternatives. The aim of this research is to propose a decision support tool that can be provided to requirement engineers for in order to help them in engineering transparency in the workplace.

2.11   CHAPTER SUMMARY

This chapter represented a review of state of the art in relation to social transparency in enterprise information systems. The review also covered related topics focusing on the effect of such transparency in different areas, the challenges of designing socially transparent systems and the approaches proposed to manage the risks of such transparency. The chapter assists the researcher in defining the research problem and scope as well as produce the materials used to initiate the scientific investigation in Chapter 4. The next chapter explains the research strategy that will follow to achieve the research aim and explain in detail the reasons for choosing the adopted research approach, methods and analysis techniques.

3. RESEARCH STRATEGY

This chapter describes the research method used through the first stage of the research. It will illustrate the design of the research, the methods used to do the research, and also the methods used to collect the data. The first decision to develop a research strategy is to decide whether to follow a qualitative or quantitative path because "generally, research can be divided into two broad methods- quantitative and qualitative" (Creswell 1994). Since researchers intended to discover a new phenomenon (i.e., risks of social transparency) which is not considered thoroughly in the academic/ practical literature, the qualitative path provides "answers why and how a certain phenomenon may occur" (Lune and Berg 2016).

Moreover, researches about transparency are more reliant on the subjective interpretation of the researchers and incapable of reuse it by subsequent researchers. Therefore, qualitative approach will help the researcher to get in-depth knowledge about the complex reality of transparency and what are the transparency design factors that affect motivation within the workplace environment. In taking the qualitative path in this thesis to research the open-ended research questions, the research option presented in this chapter follows the research strategy framework in Figure 8 provided by (Nogeste 2007).

3.1 RESEARCH PARADIGM

Research has been defined as a systematic investigation whereby data are collected, analysed and interpreted to understand, describe or predict specific phenomena (Mertens 2014). The research paradigm provides the overarching framework that defines the researcher's approach to developing knowledge (Nogeste 2007). It has been suggested that the nature of the research definition is influenced by the research paradigm which refers to the way of establishing relationships amongst constructs that describe or explain the phenomenon (Mackenzie and Knipe 2006; Mertens 2014). The term paradigm is also defined as "a loose collection of logically related assumptions, concepts that orient thinking and research"(Bogdan and Biklen 2007). Figure 8 presents research paradigm discussed in (Nogeste 2007).

3.1.1 POSITIVISIM

Positivism paradigm is a theory-based approach that implements fixed and defined research plan which is designed to prove that a predefined hypothesis is correct (Clark 2005). The positivist approach is usually associated with natural science (Saunders et al. 2009), where the hypothesis has the notion of concrete reality which is knowable and unchangeable law (Clark 2005) that defined relationships and rules of causation that apply at all times (Aliyu et al. 2014). Positivism is a method based on a rationalistic, empiricist philosophy and reflects when causes determine effects (Creswell et al. 2003). Positivism can apply to the social studies on the assumption that " the social world can be studied in the same way as the natural world, that there is a method for studying the social world that is value-free, and the explanations of a causal nature can be provided" (Mertens 2014). The positivist approach used by researchers comprises confirmatory analysis, quantitative analysis, laboratory experiments and deduction (Mackenzie and Knipe 2006; Olesen et al. 2010). Positivism research associated with the quantifiable methods used for statistical analysis (Saunders et al. 2009), while this is not always the case, qualitative data can also be used in positivist research (Nogeste 2007).

3.1.2   INTERPRETIVISM

Interpretivist paradigm is used to uncover the meaning of social aspects as an individual or group of individuals understand it (Cavana et al. 2001) and describe it in a meaningful way to research participants (Saunders et al. 2009). The interpretivism paradigm assumes that the world is as people perceive it to be (Cavana et al. 2001) and suggest that reality is socially constructed (Mertens 2005). Studies use this paradigm to explore the participants' view of the studied situation and recognise the impact of their background and experience on the research (Creswell et al. 2003). In contrast with the single reality of positivism, interpretivism paradigm assumes that the physical and social reality is viewed in different ways based on people's experience and background (Cavana et al. 2001). In addition, interpretivism research does not begin with a theory (as in the positivism approach); they inductively develop a theory or pattern of meanings (Creswell et al. 2003). Therefore, researchers who use this paradigm need a flexible plan capable of responding to participants' information (Nogeste 2007), and they most likely to rely on qualitative data collection methods and analysis or mixed-method (a combination of quantitative and qualitative methods) (Mackenzie and Knipe 2006). The quantitative method may be used to support the qualitative data and deepens its description (Mackenzie and Knipe 2006).

3.1.3   CONSTRUCTIVISM

Constructivism research is based on the concept that each individual can construct knowledge according to their interpretation of the situation (Clark 2005). Several versions of constructivism are proposed in the literature (Windschitl 2002). Constructivism approach considers "all findings to be co-created and to be equal in importance, so researchers who use this approach do not claim that their findings are more important than those of research audience nor that their findings are necessarily complete or final" (Nogeste 2007). Data collection of this kind of research is a discovery process that requires the researcher to make repeat visits to the "study site" to refine their hypothesis over time (Clark 2005). Similar to interpretivism, constructivist researcher depends on the qualitative approach for data collection and analysis or combination of qualitative and quantitative methods (Mackenzie and Knipe 2006).

3.1.4   REALISM

If positivism is considered to lie at one side of the paradigms spectrum and interpretivism and constructivism towards the other side, realism can be considered the bridge that links these

paradigms and overlapping each other (Stiles 2003) or as Symons (1994) suggests "a bridge between the divide between ideas and reality". Phenomenologists argue that personal understanding of the social world affect their behaviours and that knowledge must be examined 'inside out' (Stiles 2003). However, the realist considers that knowledge is partial or incomplete (May quoted in (Stiles 2003)) and therefore, this knowledge needs for a theoretical framework to complement and determine the underlying mechanisms that influence people behaviours (Stiles 2003). The realism paradigm may use qualitative methods such as semi-structured interviews and observation to enable the collection of rich data (subjective data). This subjective data can be supported and strengthened by the use of deduction methods such as questionnaires and extant research (Stiles 2003; Nogeste 2007). This paradigm can be used in investigating the subjectivity and objectivity of the research situation(Riege 2003). Realists aim to understand and examine the research problem by gathering multi-faceted views of reality (Riege 2003).

3.1.5   ADOPTED RESEARCH PARADIGM

The interpretivism has been adopted as a paradigm to accomplish the objectives of this thesis, namely exploring risks of social transparency, constructing and evaluating the method. After reviewing the literature and determining the research assumptions, requirements, questions and boundaries, the interpretivism has been chosen because: (i) it does not begin with a theory and due to the lack of well-defined models and approaches that provide insights on the effect of social transparency on co-workers, particularly its assessment, then this paradigm enable the researcher to inductively develop the structure of the assessment process, (ii) this paradigm is used to uncover the social aspect as individual and group of people understand it (Cavana et al. 2001) and this thesis focuses on investigating the consequences of online social transparency by exploring the human views of such social phenomenon in enterprise and recognise the impact of individual experiences on the research, (iii) the variety of methods used in this paradigm supported this research needs to investigate individual views, and this thesis used multiple qualitative methods including focus group, interviews and observations.

3.2   RESEARCH APPROACH

The two conventional research approaches comprise the steps of data collection, interpretation and theory development are inductive and deductive. The inductive approach can be described as a data-driven approach, while the deductive is a theory-driven approach (Nogeste 2007). Inductive approach is suited to the research where there is a lack of existing literature about the topic

(Saunders et al. 2007). This approach collects the data, then analyse it and interpret it to develop a theory. In addition, inductive is described as the approach of "moving from specific to general" because it "involves moving from individual observation to statements of general patterns" (Collis and Hussey 2013). The mechanism of inductive and deductive approaches works in the reverse order of each other. Therefore, the deductive approach starts with developing a theory or hypothesis and then proves it by collected data (Nogeste 2007). The deductive approach is suitable for the topic that has rich literature that enables the researcher to use it as a foundation to develop a theory (Saunders et al. 2007).

3.2.1   ADOPTED RESEARCH APPROACH

An inductive approach was the appropriate choice for this thesis. Online social transparency is one of the phenomena that occur recently in several business environments due to the integration of social media in their communication systems. However, this research area is still immature, and existing literature lacks well-defined models and frameworks for assessing the consequences of online social transparency. Therefore, this approach enables the researcher to inductively develop an assessment approach based on data derived from real practice in a business environment.

3.3   RESEARCH METHODOLOGY

Research methodology refers to the various specific tools or ways data collection, analysis, and interpretation that researches propose for their studies (Collis and Hussey 2013). Research methodology describes the methods used to achieve the research objectives. Decision in which research methodology is applicable rely on its ability to answer research questions and achieve the research objectives (Saunders et al. 2009). According to Nogeste (2007), qualitative research methodology includes several methodologies which are ethnography, case study, action research, and grounded theory.

3.3.1   ETHNOGRAPHY

Ethnography describes the research that studies people's society and customs (Collis and Hussey 2013), conducted to understand the culture of the group being researched "in the way in which they interpret it" (Saunders et al. 2009). Research that uses ethnographical methodology can be described as time-consuming research that needs to be conducted over a long period (Saunders et al. 2007). This methodology is related to the inductive approach which needs a

flexible research plan to enable the researcher to develop a new pattern based on new observations in the field (Saunders et al. 2007). This methodology includes various data collection tool such as interviewing and observation (Emond 2005). It is most well-known for its observation of a group of people in their own environment. Therefore, several challenges may face the researcher who conducts ethnographical research. One of the challenges is findings a social setting or group of individuals that able to fulfil the research objectives. In addition, the researcher needs to find a suitable way to access the sample in their environment by building a high level of trust with them. Another challenge is related to the validity of the findings extracted from the analysis of the collected data or observations. Due to the qualitative nature of the data, a follow-up studies such as interviews or focus groups can be useful to refine and confirm the results of the previous studies.

3.3.2 GROUNDED THEORY

Grounded theory methodology is often considered the simplest form of the inductive approach, which develops a theory form data collected (Brook 2004) through direct contact with the research situation and no prior theorising (Saunders et al. 2009). In this methodology, a theory emerges from the researcher investigations and integration of new arisen insights during the theory development (Stiles 2003). Grounded theory methodology can use various qualitative methods to collect data such as interviews, observations, focus groups, document analysis and diaries (Bitsch 2005). As described in the inductive approach, the theory is developed based on the analysis of the collected data and no theoretical foundation (Saunders et al. 2007). The grounded theory approach aims to use the developed theory to provide recommendations that are benefits for those in the situation being studied (Collis and Hussey 2013).

3.3.3 CASE STUDY

There are various definitions of the case study methodology. However, Case study approach is defined as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence" (Robson 2002). This definition capture most of the elements described in various definitions of case study research. This approach is suitable for the research that the real-life context is an essential part of the study. According to Crowe et al. (2011), a case study can be used to describe, explain or explore the phenomenon in the everyday context and provide causal links from the development of this phenomenon. This approach can be used for explanatory or exploratory

research (Saunders et al. 2009). Therefore, this approach usually collects data from multiple sources of evidence, using several quantitative (e.g., questionnaires) and more commonly qualitative methods such as interviews, focus groups, and observations. The use of multiple data collection method has been advocated as a way for study validation. This approach is well known as a desirable choice for evaluating the research that focuses on the development events or phenomenon within a real-life context (Yin et al. 2009).

3.3.4   ACTION RESEARCH

Action research can be described as a family of methodologies that are used for enquiry and track the dual outcomes of action and research at the same time (Nogeste 2007). According to (Saunders et al. 2009), action research is a participative form of research which depends on the involvement of practitioners and researcher in collaborative work to search the study issue. Thus, action research differs from other methodologies due to its focus on the actions in their context, e.g., organisations (Saunders et al. 2009). This methodology is also described as an aspect the combines thought of observations and related literature to create the next cycle of actions and research (Kemmis et al. 2013). The value of this methodology comes from its "focus on change, the recognition that time needs to be devoted to diagnosing, planning, taking action and evaluating, and the involvement of practitioners throughout the process" (Saunders et al. 2009).

3.3.5   ADOPTED RESEARCH METHODOLOGY

Due to the inductive nature of this research and the exploratory orientation of research questions in this thesis, the grounded theory approach is the most appropriate approach to adopt. Grounded theory enables the researcher to explore as many variations as possible of human behaviours, issues, and concerns about the research problem to develop theories driven from data collection methods (Nogeste 2007). This thesis focus on develop a meaningful conceptualisation of the consequences and risks of online social transparency and provide a practical assessment approach that can be used to develop the practice of such a phenomenon. Therefore, the outcome of this thesis is data-driven and inductively generated based on the research questions. This thesis does not aim to generate a "full fat grounded theory" (Braun and Clarke 2006), which requires more profound research questions.

Data for research can be collected through various types of methods, including humans or documents. There are two main methods to collect data from people either by using surveys or interviews. Surveys can be used to collect data for easy comparison and it is suited to " the collection of a large amount of data from sizeable population in a highly economical way" (Saunders et al. 2007). In contrast, interviews rely on the contact between the researcher and interviewee to research the issue. Unlike surveys, an interview requires a limited number of interviewees and that depends on the reach of saturation point (Saunders et al. 2007). Due to the qualitative nature of this research, (Nogeste 2007) provided four categorisations of qualitative data sources: individual meetings/interviews, group meetings/interviews, workshops and reference to documentation.

3.4.1   ADOPTED DATA COLLECTION METHODS

In this section, the focus is on the techniques which can be used to obtain data related to the research problem including focus groups, interviews, and observations. The following sections will explain the adopted data collection methods.

3.4.1.1   FOCUS GROUPS

A focus group is used for generating information on collective views and understands the meanings behind those views (Basch 1987). It is also useful in gaining a rich understanding of participants' experiences and views. Discussion concerning a problem often produces useful information and various new ideas can be developed through such a method (Liamputtong 2011). This research involves focus group sessions to achieve objective 2 which is about exploring the assessment factors that have a vital role in designing assessment methods for social transparency. The group is made of participants who have special experience or knowledge about the research problem.

Scenario is a technique used to gather data from respondents based on specific situations (Sleed et al. 2002). Scenarios allow participants to respond in various ways to short stories about characters in specified circumstances (Bishop et al. 2007). Scenario is a multi- method approach that has been widely used as a complementary technique with other data collection methods such as interviews (Wade et al. 1999), focus group (Sleed et al. 2002) and also observation (McAuley 1996). In this research, scenarios were used with the focus group method to warm up the

participants and allow them to draw a complete picture of the situation before discussing the questions. Due to the fade picture of the effect of social transparency in the workplace and its assessment factors, scenarios were used to draw the boundaries and assumptions of this research.

3.4.1.2   INTERVIEW

Interview is a powerful method to explore in-depth qualitative information (Kothari 2004). It is useful to explore the thinking, assumptions, attitude, perceptions which may influence observed behaviour such as social transparency in this research. Creswell et al. (2003) identified three fundamental types of research interviews: Structured, semi-structured and unstructured.

- **Structured interview** involves the use of questionnaires based on a predetermined set of questions. The researcher starts the interview and refers to the written questions one-by-one. This helps in obtaining clear answers for comparison purposes.
- **Semi-structured interview** consists of several key questions that help to define the areas to be explored but also allows the interviewer or the interviewee to diverge in order to pursue an idea or response in more details. The order of the questions might also differ between different interviewees when needed.
- **An unstructured interview** is an informal discussion where the interviewer wants to explore in-depth a topic with participants in a spontaneous way. In this kind of interview, the researchers need to have a clear background of the aspect the want to explore, and then they can talk freely with the participant without any limitation of questions.

In this thesis, a semi-structured interview was conducted to fulfil Objective 3 and to explore the risk and risk factors of practicing online social transparency in enterprise. In chapter 5, the interview with participants from various organisational and academic roles was for two reasons: (i) to validate the results from the focus group study and (ii) to explore the risk that stems from the unmanaged social transparency and the factors that play a role in the occurrence of these risk. In chapter 6, the interview was used with the observation study to evaluate the results gathered through the observation and the previous interview study.

3.4.1.3   OBSERVATION

Observation study is defined as the method of viewing and recording the actions and behaviour of participants (Saunders et al. 2009). As the name describe, it is a method that

observes participants without disturbing, influencing or altering the environment or the participants. Observation method is used for the following variety of reasons

- To collect the data from a natural setting with no influence on the participants' behaviour.
- To explore the actual behaviour of the participants that might be different in experimental settings.
- To understand the settings of the observed behaviour and how it plays a role in the results.
- To explore a topic that has not been previously studied nor has few studies around it.
- There are three types of observation methods based on the extent to which the researcher interacts with the environment.

Naturalistic observation: This method takes place in a real context and natural daily settings of the participants without intervention by the researcher (Angrosino 2012). This method allows the researcher to observe the spontaneous and natural behaviour of the participants in their natural surroundings. Based on (Angrosino 2016), this method advantage of the increased ecological validity. The disadvantage of this method is the difficulty to replicate the actions as some settings and contexts cannot be replicated such as observing the interaction of children in playground.

Participant observation: In this method, the researcher is engaged as a participant and he/she can intervene in the participants' environment (Jorgensen 2015). This method allows the researcher to observe behaviour that may not be accessible to the researcher. Participant observation can be covert or overt. In covert participant observation, the identity of the researcher and the purpose of the observation are hidden from the participants (Kawulich 2005). In the overt observation, the identity of the researcher is introduced to the participants and permission to make the observation must be taken form the participants. This method is appropriate method to take a more in-depth insight into the participants. However, (Kawulich 2005) argued that this kind of observation might be difficult if it is covert because the researcher may find difficulty to record the observation and also there is a danger that the researcher may become too close and lose his/ her objectivity which may cause bias in the results.

Controlled observation: This type of observation is conducted under controlled and arranged conditions such as in laboratory settings (Giorgi 1986). Controlled observation is an overt observation as the researcher has to explain the purpose of the research and the participants

have to consent to be observed (Jorgensen 2015). Based on (Kawulich 2005), this kind of observation can be reproducible and therefore can be tested for reliability. It also can accommodate a large sample size in a reasonable time.

- Regardless of the type of observation, there are various forms of data collection methods for observational studies.

- Written narrative field notes: this data collection method is the most descriptive and detailed form of data collection. However, its analysis might be difficult and time-consuming.

- Templates or observation sheet: this method can assign observation behaviour to "code" or to a numerical value which makes the analysis easier.

- Audio/visual recordings: this method can be used to refer to the data for further analysis of the data is being analysed. This method can be done in conjunction with previous methods (written notes and observation sheets).

In Chapter 6, the researcher conducted a two days naturalistic observational study in two small-scale companies in order to refine and validate the result of the previous studies. The researcher observes the enterprise social software used in both companies to explore the risks and risk factors of social transparency further and confirm they exist in real context. A short interview with some employees was conducted after the observation. Figure 9 shows the mapping between the research objectives and the adopted data collection methods.
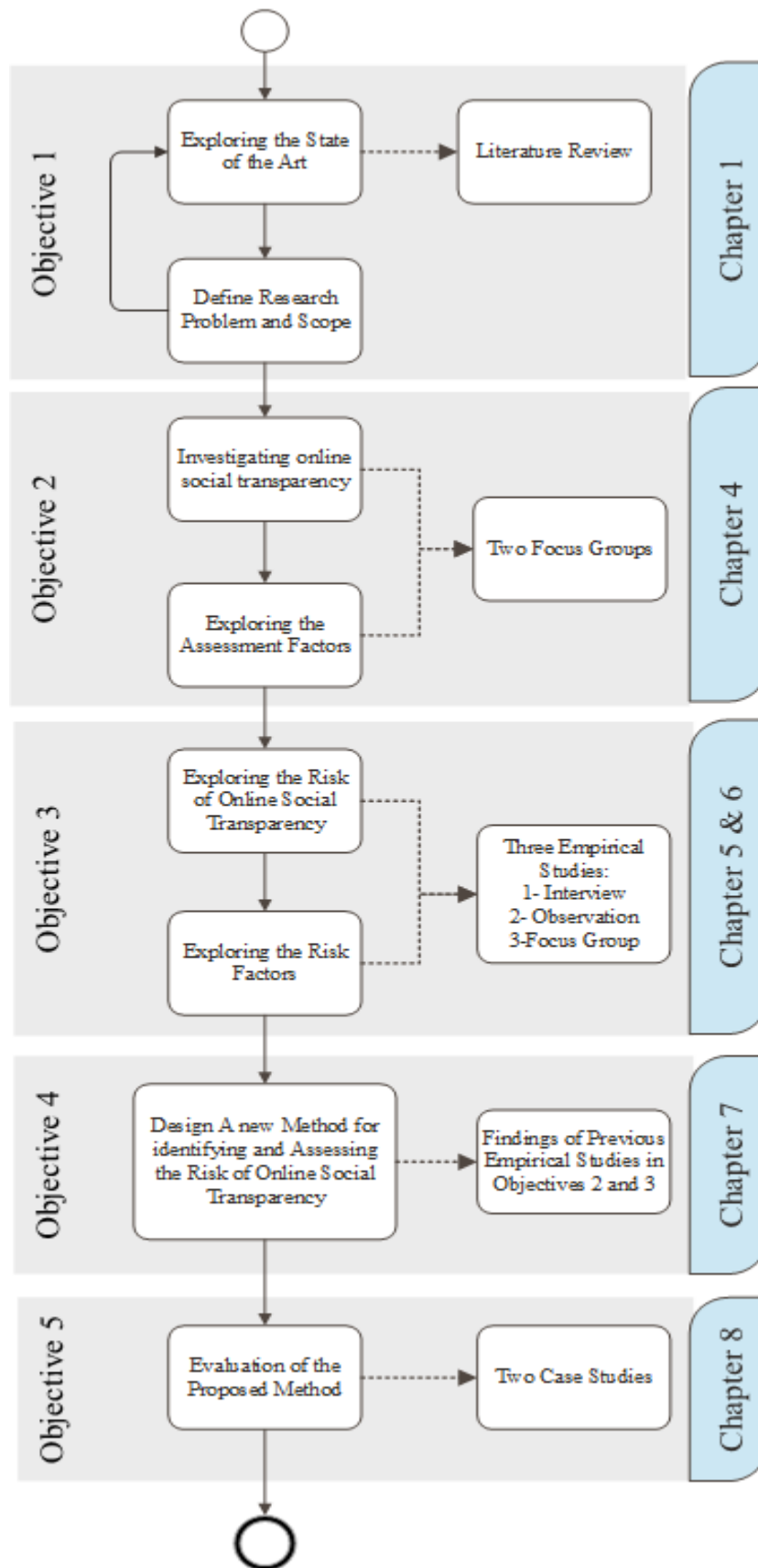
FIGURE 9: MAPPING OF RESEARCH OBJECTIVES, RESEARCH
PROCESS AND THE ADOPTED METHODS

3.5   DATA ANALYSIS METHOD

3.5.1   CONTENT ANALYSIS

Content analysis defined as "any technique for making inferences by objectively and systematically identifying specified characteristics of messages" (Lazar et al. 2017). According to this definition, textual and visual data can be analysed by this approach, such as documents, books, pictures, audios, and videos. Content analysis is a technique that can be used for quantitative and qualitative research. It searches for theoretical interpretations that may generate new knowledge (Lazar et al. 2017). This kind of analysis enables the researcher to collect data from the data corpus. Content analysis is used due to its power as a tool to (i) determine authorship by examining the author's prior writings, (ii) examine trends and patterns in documents and (iii) provide an empirical basis in monitoring shifts in audience opinions (Stemler 2000).

3.5.2   THEMATIC ANALYSIS

Thematic analysis is a process uses with qualitative information (Boyatzis 1998). Thematic analysis is described as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun and Clarke 2006). A theme is a pattern found in the information that either organises the possible observations or interprets aspects of the phenomenon (Boyatzis 1998). A theme " captures something important about the data in relation to the research questions, and represents some level of patterned meaning within the data set" (Braun and Clarke 2006). According to (Braun and Clarke 2006), thematic analysis is a process that involves six phases to generate themes related to the research questions systematically. Themes within the data can be generated either through the inductive approach or deductive approach (Fereday and Muir-Cochrane 2006).

On one hand, the inductive analysis refers to the inductive approach in generating the themes. This approach described as data-driven analysis because it strongly links the theme to qualitative data (Braun and Clarke 2006). This approach of analysis does not require a predefined coding frame or analytic preconception to extract codes and generate themes (Braun and Clarke 2006). On the other hand, deductive analysis relies on the researcher's analytical experience and interest in the research area (Braun and Clarke 2006). Unlike the inductive approach, this approach tends to provide less description of the data overall but a more detailed description of some aspect of the data. Thematic analysis is known for its various advantages in (i) using it within the

participatory research approach, (ii) summarising critical elements in a large volume of data, (iii) exploring similarities and differences across the data.

Content analysis and thematic analysis are the most common methods used in research. For some researchers, it is difficult to see the difference between content and thematic analysis because both include identifying themes across a data set. However, content analysis is commonly used for the research that focuses on creating codes based on the word-frequency count technique, while thematic analysis reflects the fact that the data have been summarised and organised into themes rather than analysed (Maguire and Delahunt 2017).

3.5.3   CASE STUDY ANALYSIS

The case study method enables a researcher to examine data within a specific context and to test if the scientific theories and models can work in the real-life context (Zainal 2007).   Simons (2009) defines the case study as "in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, program or system in real life". Simons also emphasises that a case study is not a method; it is a design framework that may incorporate various methods. An individual case study can be studied from different perspectives- both qualitative and quantitative (Zainal 2007). Case studies are used to validate some of the variables that are difficult to measure such as social variables: democracy, power, equality. In addition, case studies are also used to analyse the causal relations (Starman 2013).

3.5.4   ADOPTED DATA ANALYSIS METHOD

This research uses the inductive approach, particularly grounded theory, to explore the assessment factors of online social transparency and the potential risks of its unmanaged implementation. By reviewing the literature, there was no clear depicting for these factors as well as no assessment approaches related to the research problem. Therefore, thematic analysis was used to introduce new concepts and factors related to the problem of unmanaged implementation of online social transparency. For the evaluation stage in this research, A case study method was used to examine the validity and applicability of the proposed assessment method in real organisation context. The evaluation study aims to validate the effectiveness of the assessment method in detecting and assessing the risks of social transparency in real enterprise information systems.

3.6 ETHICS IN RESEARCH

Research that involves humans as its participants raises important and complex ethical concerns. Ethics in research tries to ensure the health and safety of the human participants and to ensure the researches contribution to be in the interest of individuals, groups, or societies. These are achieved through assessment and management of the risks that the research may pose to its participants, protection of confidentiality throughout the data collection and analysis, and the process of informed consent from the human participants.

In this thesis, all phases of the research went through an online ethics checklist, which will be assessed by experts in the field of ethics in research for their approval. In case the research is found to pose potential risks for the human participants, a hearing session in a research ethics committee will be conducted and the decision will be made. A copy of the research ethics checklist can be found in Appendix 11.1. All participants in all phases of the studies in this thesis will be provided with an information sheet that will describe the research, its aims, and its benefits for the participants, as well as contact details in case further information is required, Copies of the participant information sheet can be found in the Appendices of chapter 4, 5, 6 and 8 for each study. In addition, the participants were given a consent form to sign before the commencement of each study. The consent form informs the participants that their information will be anonymised and used for research purposes only, as well as informing them that they can withdraw from the research at any stage to the point of data anonymization. Appendices of chapter 4, 5, 6 and 8 includes a copy of the consent form for each study.

3.7 CHAPTER SUMMARY

In this chapter, the research strategy was explained along with details regarding the reasons for choosing the adopted research paradigm, approach, methodology, data collection and analysis methods. In the next chapter, the first study that attempts to achieve objective 2 of this research. The adopted research method is explained in more details and the results are illustrated and described.

4.   EXPLORING SOCIAL TRANSPARENCY IN ENTERPRISE INFORMATION SYSTEMS

This chapter presents the first study conducted in order to explore social transparency and the diversity of views on its effect on co-worker interaction in organisations. This chapter describes the goal of the exploration study, the data collection method, the data analysis method and the themes extracted from the study.

4.1   THE GOAL OF THE STUDY

We found in the literature that transparency between individuals in the workplace is related to various properties such as building trust relationships, decrease corruption, enhance accountability. However, there is a lack of literature on transparency that practiced voluntarily and its effect on the group work. Therefore, an exploration study is needed as the first phase in this research. The results of this study are used as a foundation for the next steps in this research.

4.2   DATA COLLECTION METHOD

Focus group methodology requires that participants are knowledgeable about the topic they are asked to discuss. Focus group with participants from academia and industry is part of research strategies that include individual experience; it is a process of 'research with' rather than 'research on'. Two semi-structured focus groups were conducted with 14 participants to explore how they view voluntary transparency in the workplace and how it affects work in the organisation. Participants in this study were recruited based on a snowball sampling process to reach individuals. Conditions restricted participation to those who worked in organisations where collaborative work with other roles as needed. To ensure the diversity of views, opinions and with regards to their understanding of transparency in the organisational context and with regards to their experience in the workplace, participants were from both academia and industry. Academic participants were staff in the universities, and they were from different fields (psychology, management, media, education, computing) and different countries. All participants were staff and have experience in the workplace environment and communication with colleagues via computer systems. Table 2 shows the information of the participants in this study.

Participant No.	Work Field	Gender	Affiliation
P1	Academic	Male	Computing
P2	Academic	Male	Computing
P3	Industry	Male	Software Engineering
P4	Academic	Female	Media
P5	Industry	Male	Software Engineering
P6	Academic	Male	Management
P7	Academic	Female	Psychology
P8	Academic	Male	Computing
P9	Industry	Male	Software Engineering
P10	Academic	Female	Education
P11	Academic	Female	Psychology
P12	Industry	Male	Software Engineering
P13	Industry	Male	Software Engineering
P14	Academic	Male	Management

Each focus group session lasts for two hours. At the beginning of the session, the researcher provides a presentation including various definitions of transparency that are possible to exist in the workplace as well as an explanation of the purpose of the focus group session. The researcher then described the procedure of the study and how the discussion will go. Four scenarios depicting various problems related to voluntary transparency were used as study material; each scenario has questions to be answered individually and then discussed with the group (See Appendix 11.2.3). The rationale for each scenario was as follow:

Scenario 1

Mark is a designer in the graphics and animation department of a company that is interested in e-learning and e-publishing. He was working with a team to design an animated video for e-learning training. Each member has a profile page on the organisation's website. The design of the profile

page was simple, and it allows them to post necessary information such as personal details, contact details, and status. Mark uses the status feature to describe his current work or to inform his colleagues if he is busy. One of the posts on his profile was "**Editing audios is a tough task.**" the post was visible to all members in the company. Therefore, his team knows that he is capable of doing the task but they think that he currently does not want any interruptions. The project manager expected him to finish the task by the end of the week because the project should be delivered within three weeks. However, when he saw Mark's post, he thought that Mark was not capable of finishing the task on time and so he decided to delegate the task to someone more competent.

Rationale for scenario 1: This scenario shows that transparency can be used to avoid actions such as interruptions from others or to seek actions such as motivate others to help. But incomplete transparency can make side effects such as misconception or uncertainty. The consequences of incomplete transparency can also lead to making incorrect decisions.

Scenario 2

Richard is a lecturer of two modules in the computing department and he is also the head of the department. He usually deals with several things besides providing lectures such as meetings and responding to emails. Some of the emails come from his students regarding assignments enquires or other enquiries. He does not have a fixed way in which he replies to emails, but he does not ignore them. He responds to the emails when he is available, but the emails may be delivered late to students. His students thought that he does not consider their needs because he does not always reply to their emails on time. They would like to know the reasons behind the late responses. That adversely affects their self-esteem because he might respond to some students on time and others may get a late response. At the end of each semester, the faculty conducts a survey that asks students to provide feedback about the modules and lecturers. Richard received negative feedback from his students regarding his late responses to their emails. Before that, He does not think that his attitude will affect the relationship with his students.

Rationale for scenario 2: This scenario shows that the level of transparency can affect the relationship with others. Providing more details can help in making people feel close and valued by others which consequently builds a good relationship. Therefore, transparency can help individuals to feel more related to each other and then feel motivated to take positive actions.

Scenario 3

Jimmy is a lecturer in a university. He teaches two modules in the department of computer science. He has in total 120 students in both modules. He got submitted assignments for each module. He has to prepare the grades in two weeks. Jimmy has not started the marking yet and he has to attend a conference for 4 days which may cause a delay in preparing the grades. He thinks that Russell (his lab assistant) can help him in marking the assignments. He met Russel in the lunch break and informed him that he has 120 programming assignments to mark and they should be ready in two weeks. Despite that Russell has good experience in reading the programming texts but he did not offer any help because he is working on preparing the material for the lab sessions.

Rationale For scenario 3: The scenario shows that the content of transparency can motivate the individual to collaborate. Providing more information about the task such as task difficulty, task significance, and task priority can affect the autonomous decision making.

Scenario 4

An airline company has many complaints from customers about not answering their calls or put them on hold for a long time. The company aims to increase the number of calls that are answered to satisfy the customers and increase productivity. As a result of a close meeting between the director and the supervisors, they found options that help in increasing the number of answered calls. For example, sending frequently asked questions to an automated answer, answering queries via email, reducing time spent on hold or reducing call duration. Then supervisors inform their groups about these options without providing any justifications about the plan and the options. The employees do not have idea why these options have been provided. Later, the company noticed that there are still complaints about the same issues from the customers.

Rationale for scenario 4: This scenario shows the effect of transparency on the decision-making process. It also shows that employees have the right to be involved in the decision-making process which enhances their autonomy and motivates them to take action.

At the end of the session, there was a general question that covers the research topic and to clarify some points of view. The focus groups were transcribed verbatim to support further analysis. We used a thematic analysis approach through coding the content and grouping the codes into themes. For each discussion around each of the scenarios analysed, we identified the participants' views on their transparency expectations from their co-workers and managers through to information systems and the concerns they have around it is affecting their role, social dependencies, and actions. We used the findings as a template for designing the next study (interview), discussed in the next chapter.

4.3 RESULTS

Discussions in the focus group were recorded and transcribed. The analysis method used in this stage was thematic analysis as a qualitative approach. Thematic analysis is described as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun and Clarke 2006). It organises and describes the data in rich detail. Several thematic areas were formed from the analysis. The thematic areas are transparency usage, transparency content, transparency timing, transparency presentation and the recipients of transparency. These themes discussed in the following sections. Participants quotes labelled by focus group number and participant number, for example F1.1 means Focus group1. Participant 1. Table 3 shows examples of the themes extracted from the analysis of the focus group. Appendix 11.2.4 shows more examples about the other extracted themes.

TABLE 3: EXAMPLES OF THE EXTRACTED THEMES FROM THE FOCUS GROUP STUDY

Theme	Sub-theme	Quotes
Content of transparency	Individual capability	In scenario 1, "for the manager, the issue was about completing the task, so Mark should show his strength and weakness to show the manager if he is able to finish the task or not" **F1.4**
	Progress	In scenario 1, "the manager will be more cautious about the time, so, Mark better to show the progress of the task and that would make positive impression to the manager" **F1.5**
	Obstacles	In scenario 3, "Jimmy should talk about his problem for example he has conference for 4 days, he probably do not have time to mark and the consequences and then leave Russel to decide whether he actually thinks that he should offer help or not" **F1.1**
	Resources	In scenario 1, "if mark wants to show that he need a help he has to be open about what cause the delay for example lack of resources" **F1.6**
	Task Effort	In Scenario 3, " jimmy wants Russel to work with him, So if jimmy do some of the marking and tell Russel that he did this much of the paper and he just need to do the rest, that will minimise the effort to do the task" **F1.5**
	Priorities	In scenario 3, "Jimmy can just tell Russel that the priority goes to attending the conference although that may cause a problem to Jimmy" **F1.4**

4.3.1 ASPECTS OF SOCIAL TRANSPARENCY IN ENTERPRISE

Participants started viewing the scenario and the questions associated with them. Based on the scenario, participants need to extract answers to several questions. The questions were related to the potential uses of social transparency in the workplace and the type of information that may be used for social transparency.

4.3.1.1 SOCIAL TRANSPARENCY AS AN AWARENESS AND SUPPORT MECHANISM

In the literature, limited studies have explicitly investigated the use of social transparency in organisational context. Existing studies in the literature presented social transparency as a valuable requirement for work productivity but fewer efforts have been made to investigate the effect of social transparency in enterprise deeply. Participants emphasized that transparency supports the human tendency to move towards growth and satisfy the needs which facilitate that growth. They mentioned that transparency triggers motivation by satisfying intrinsic needs and extrinsic needs. Needs are motives that drive all humans to take actions and these motives can vary among individuals (Gagné and Deci 2005). The following sections describe the different roles of social transparency as a support mechanism in the enterprise.

Internal Needs Support Mechanism

- **Autonomy**

Autonomy defined as engaging in an activity with a full sense of willingness, volition, and choice (Gagné and Deci 2005). The results from this study found out that social transparency between co-workers could satisfy the feeling of autonomy by being transparent with them about alternatives in terms of time. For example, in scenario 2, *"when a lecturer shares his/her timetable with students to facilitate contacting with him/her"* (F1.9) or in terms of problem –solving options such as in scenario 4, *"when a supervisor in call centre provides his team with the purposes of the options to solve certain problem"* (F1.6). Participants' points of view showed that transparency could affect co-worker's motivation and commitment by making them feel self-directed.

- **Competence**

Competence refers to the desire to interact effectively with the work environment and experience a sense of effective in producing the desired outcomes and preventing the undesired actions (Edmunds et al. 2008). Participants also claimed that social transparency could affect the feeling of competence, which in turn affects their collaboration. They argued that social transparency supports the feeling of competence through sharing information about progress, knowledge or experience. It is stated that

"being transparent about how someone good in performing a task satisfies the feeling of competence" (F1.7, F2.1). For example, from scenario 2, F1.7 declares that a lecturer can motivate his/her assistant to mark lab assignments by informing him/her how quick he is in these specific tasks. F2.1 also suggests that social transparency in scenario 2 can be used to *"highlight how good the assistant is in reading technical materials"*.

• **Relatedness**

Based on the definition provided by Gagné and Deci (2005), Relatedness means the feeling of belonging to a group or having a close relationship with others. This study found that social transparency amongst colleagues supports the feeling of belonging by the dedication of resources, which means volunteering time or energy. For example, F1.9 stated that *"when a manager comes forward to meet and talk with his/her employees, that makes them feel respected and motivated"*. Moreover, social transparency support relatedness through revealing information about availability in case of need such as *"shares sufficient details in the online calendar with colleagues or students"* (F2.7).

Moreover, some participants stated that social transparency supports the need for attunement by gathering information about others in order to pay careful attention to them. We also found that social transparency supports ownership by involving individuals in the problem-solving process which consequently enhances their relationships (F2.5). According to Silva et al. (2014), involvement is one of the key component techniques that support the need for relatedness, thus fostering the process of internalization which in turn leading to autonomous motivation.

• **Fairness**

In this study, participants suggest that perception of fairness is essential to support wellbeing, performance and productivity. They also link social transparency to the perception of fairness by being transparent about the performed tasks such as in scenario 2 *"when the lecturer motivates his/her assistant by sharing the work that accomplished and what the assistant just needs to do"* (F1.5). An individual can feel a sense of fairness if others are transparent about dividing the tasks based on their capability. Such kind of transparency may increase the chance for collaboration. For example, from the situation in scenario 2, *"the lecturer may mark the textual part of the assignment and the assistant mark the programming part"* (F2.1).

Moreover, reciprocity has been seen as one of the powerful social norms that produce motivation and facilitates cooperation. Participant F1.9, F1.1 suggest that being transparent about this kind of

norm build trust between individuals in the workplace and accordingly satisfies the feeling of fairness. For example, if someone (e.g., Supervisor) wants to influence and motivate someone else (e.g., co-supervisor) to work with him on a certain mission, he can offer him a favour in return. Therefore, transparency in offering a favour in return could influence the feeling of fairness which leads to motivation.

External Needs Support Mechanism

In addition to satisfying the internal needs, the study also found that human need to satisfy external needs e.g. work-related needs or individual related needs. According to Deci et al. (2017), activities that are not interesting (not intrinsically motivating) require the satisfaction of external needs that are related to well-being at work or social life. The following are the external needs that can be supported by social transparency.

- **Job Enrichment:**

Job enrichment is a management concept that used to motivate self-driven employees by assigning them additional responsibility generally assigned for the higher-level employee (Tufail et al. 2017). By doing this, employees feel that their work has meaning and importance to the organisation (Tufail et al. 2017). Two participants state that one of the external needs that influence individual motivation is the value and benefit of the motives for their job. For example, we found that employees can be motivated when they feel that the provided information can increase their work experience. An example from the participant answers shows that *"the lecturer can motivate his assistant by showing him that the marking can add value to his experience if he did not mark before"* (F1.6). Another example of using social transparency for job enrichment is revealing information about the required knowledge and skills. In scenario 2, F1.7 illustrates that transparency about the need for skilled employees to perform a certain task has the potential to increase their motivation and sense of accountability. Social transparency can be used as a medium to add more meaningful information to the proposed task to make it more rewarding or satisfying.

- **Job Simplicity:**

Based on Fogg behaviour model (Fogg 2009), there are three types of triggers that affect the relationship between motivation and ability. One of these triggers is a facilitator who is applied when there is high motivation but low ability and seeks to simplify the task. One of the ways of simplifying the task is by breaking down the task into small tasks. Discussion of the situation in the scenarios highlight that transparency about breaking down the task can be used as a trigger to motivation such

as *"dividing the marking task between lecturer and assistant will make the task seem less difficult to perform"* (F1.8). We found that social transparency here is paly a facilitator role that encourages individuals to collaborate. Another way to simplify a task is by revealing information that shows how the task can be performed (F1.7). In other words, guiding how to do a task. It was stated that people with low motivation may perform a task if it is simple, and the task becomes straightforward if the individual needs to be aware of how to perform it. Therefore, Social transparency plays a role in making others aware of how to perform a task. For example, in scenario 2 *"being transparent about the availability of the answer sheet, the assistant would be more happy to help"* (F1.7).

- **Job Significance:**

Feeling significant of the task is one of the external needs that need to be satisfied to motivate workers in the workplace. Quotes from participants F1.5, F1.6, F1.7 show that *"individual can feel the importance of specific action if he knows the benefit of that action for his life or his wellbeing"*. As noted from the study that social transparency can be used to deliver the importance of a task to motivate individuals to cooperate in that task. For example, being transparent about how this task could grow the individual experience such as *"a supervisor can tell his assistant that marking can increase his experience in teaching" F1.6*, could get monetary benefits such as *"when an individual be transparent about promotion and rewards that may gain as a result of accomplishing of certain tasks" F1.7*.

Another example is transparency about the opportunity to gain recognition and affection which may consider important to some employees. Regarding social transparency in Scenario 2, some participants stated that the lecturer could motivate the assistant by *"being transparency about writing acknowledgment or writing good feedback in the annual report"* (F1.5, F1.7). Moreover, it is noted that social transparency about cognitive development may also encourage collaboration amongst employees. For example, transparency about the added value that can be obtained from performing certain tasks such as the value of new knowledge, enhancing skills and enriching the experience.

4.3.1.2   *THE SUBJECT OF SOCIAL TRANSPARENCY*

In each scenario, participants emphasized the relation of the visible information and the scenario problem. A participant in our study stated that *"Implementing transparency is not enough to improve the quality of the work, but the information that revealed to colleagues has an effective role in the improvement process"*. As mentioned before that our analysis was based on the goal-oriented framework of organisational information systems. Thus, our findings are related to the type of information that should be visible between social actors in relation to their goals, tasks, resources,

and interdependencies. Based on the problem described in the scenarios, the following are examples of the information that may be revealed as social transparency amongst actors.

- **Individual Capability**

Capability refers to the power to perform specified tasks or to achieve specific goals. Thus, transparency about individual capability within a work environment has a role in motivating some employees as well as demotivating others. Our findings reveal that capability can be related to various aspects. For example, transparency about individual capability can be seen as sharing information about the <u>individual skills</u> to perform a certain task. Another example related to capability is revealing an <u>individual's knowledge</u> in a particular task. It was commented on scenario 1 that *"employees may show their low practical understanding of how to mark assignments"* (F1.4).

Moreover, capability can be related to <u>the time to perform a task</u>. It was suggested that an individual might express their capabilities by revealing the expected time to accomplish the work. For example, *"Employees may share with their colleagues that certain task is challenging but it will be done within one week*" (F1.2, F2.5).

- **Progress**

Individuals in the work environment can share information about their progress as a form of social transparency. It was argued that employees could be motivated when they are aware of the work progress of each other. Revealing information about work progress may include <u>the amount of achieved work (completed work)</u>. For example, in collaborative software, *"employees can share the amount of work they did so far e.g., 70%"* to encourage others to adjust their efforts (F1.3). Sharing the <u>current stage in the plan</u> to achieve a goal is also one of the ways to show the progress of the work as expressed in the study as *"employees can share their current task and the plan to achieve it" (F1.2).* It was suggested that being transparent about the <u>remaining work</u> is also a kind of social transparency to motivate employees in the workplace e.g., in scenario 2, *"Lecturer can motivate his assistant to mark the assignments by informing him that he (the assistant) need just to mark 20 assignments" (F1.5).*

- **Obstacles**

An obstacle is a thing that prevents progress. It is noted from the study that being transparent about the obstacles is a kind of social transparency to increase motivation and collaboration in the workplace. Participants illustrate that sharing the barriers and obstacles that hinder someone's

progress can bring empathy and consideration to others. For example, <u>lack of time</u> is one of the obstacles that hinder the progress and being transparent about it can motivate others to cooperate as in the following example *"Lecturer should tell his assistant that he has a conference for 4 days and he does not have time to complete the marking, then the assistant will help him in the marking"* (F1.1). <u>Lack of resources</u> also another example of social transparency, such as *"being transparent about the old version of the used software",* would make the manager provide the newest version of the software or at least being aware of the reasons that hinder employees' progress (F1.4). In addition, people can be transparent about the <u>workload</u> to motivate others to cooperate with them. One of the comments on scenario 2 was *" lecturer can be transparent with his student about how much of work he has on hand to avoid any misconception with them, and that can also make students to consider his busyness and may contact him in another time "* (F1.8).

- **Task Properties**

The task is one of the main components of the organisational information systems. Transparency related to the task has an effect on productivity in the workplace (Marlow and Dabbish 2014). It is stated in the focus group study that colleagues would be more motivated to engage if they are aware of some properties related to the task between them. One of these properties is <u>task status</u> if it is active or inactive. Knowing the status of the task would motivate others to engage in that task. Based on scenario 2, it is explained that *" lab assistant would help the lecturer in case he knows that the lecturer starts the marking but he cannot finish it on time"* (F2.3). <u>Task effort</u> also one of the properties that can be used as a form of for social transparency. It is noted that *"the minimum the effort to do a task, the more motivated to engage"* (F2.1)**.** Fogg (2009) explains that people tend to be lazy. Therefore, it is a better idea to make the behaviour easier and simpler. Participants declare that social transparency amongst peers may also include <u>task complexity</u> to motivate workers who like challenging work and satisfy their need for competence. For example, in scenario 1, *"a graphic designer can share with his/her colleagues that he/she works in a complex editing tool"* which in turn could attract others who are interested in the editing (F2.2)*.* One of the information that also related to the task is <u>task importance</u>**.** Based on the participants' point of view, F1.1 states that *" an explanation showing the importance of specific tasks in the work environment can be used to increase the quality and quantity of the effort".* Another property is <u>task priority</u> that shows the importance of task over other tasks such as in scenario 3*" the supervisor may inform his assistant that it is important to attend the conference, but he still has to mark the assignments"* (F1.4).

- **Goal Properties**

The goal is not less important than the task in the organisational information systems. As transparency in this research related to individual intentions in the work environment, goal properties are important information that may affect performance in the workplace. One of the properties is goal status. Similar to task status, goal status can show the active and inactive goals. It is stated that revealing the status of the goals between different actors in the organisation could encourage colleagues to take action either by engaging in the process to accelerate the achievement of the goal or by looking for alternatives. For example, In scenario 4, supervisors in the call centre have different goals to improve the performance, but by informing their teams that "*they are now working to increase the number of answered calls*" (F1.8)*,* their teams will concentrate their work regarding achieving that goal. Social transparency may also include goal duration which means either long-term goal or short-term goal. It was noted from the findings that transparency about goal period affects making people feel motivated. Some people may feel motivated to engage in the short-term goal especially for those who want to see quick outcomes. Moreover, providing a rationale for the goal also affects the motivation within the work environment positively. Regarding the case of scenario 4, participants state that *"employees in call centre need to fully understand the reasons behind the execution of the new plan and that makes them feel they are an integral part of the team*" (F2.5, F2.3, F1.6)*.*

- **Urgency**

Urgency means threats to well-being in the near future. As noted from the study that participants state that social transparency can be used to trigger a **sense of urgency,** which in turn motivates people to take action. In the work environment, Triggering a sense of urgency can enhance motivation and commitment in employees (Silva et al. 2014). Participants suggest different ways of social transparency that may trigger a sense of urgency. First, transparency about the threats that may happen, such as in scenario 3, *"lecturer can be transparent about what may happen if he/she did not finish the marking on time e.g., get negative feedback from students"* (F2.2, F1.1). Second, transparency about the deadline as stated regarding the situation in scenario 3 that *"being transparent about the deadline and the inability to finish the marking on time" (F2.3).* In addition, transparency about unexpected events also can trigger a sense of urgency e.g. *"when a supervisor can be transparent that he mixed up the dates of the conference and marking deadline, then the assistant may offer a help" (F2.2).*

- **Interests**

Sharing personal interests is another example of social transparency that may occur amongst enterprise members. Three participants describe his social transparency behaviour as *" using the status feature on the website to show my interests and things I like to do, this is also can be valuable to people who are interested in these things" (F2.5, F2.2, F1.7).* Based on cooperative freedom theory, people can be autonomously stimulated to cooperate if they are aware or have access to information about each other (Dalsgaard and Paulsen 2009). In our study, some participants state that interests can be related to <u>technical interest</u> such as in the situation of scenario 1 *"the employee can share with his/her colleagues that he/she likes editing, and that may motivate them to work with him or even ask about it" (F2.5).*

4.3.2   BASICS FOR SOCIAL TRANSPARENCY ASSESSMENT

The main aim of this study is to answer the first research question through exploring the assessment factors of online social transparency. The findings were presented as a concept map that is meant to provide a baseline for assessing online social transparency. This map is intended to help requirements engineers and systems analysts to use it as checking points to assess transparency. Discussion in this section is around the following question:

- What are the factors that are necessary for assessing social transparency in each scenario?

Our analysis for this question was based on the goal-oriented framework of organisational information systems. It represents a natural synergy with transparency as informational requirements amongst social actors around their intentions, goals, tasks, and interrelations, and social structure. We found four essential factors that play a critical role in assessing transparency between organisational social actors, presented in Figure 10. The four factors are the content of transparency, the presentation of information, the timeliness of disclosing the information and the characteristics of information recipients.

Transparency Timeliness
- Must the information be provided (before, during, after) the activity?
- Must the information be provided in real-time?
- Do recipients need specific frequency of providing the information?

Transparency Content
- Is the information available?
- Is the information relevant?
- Is the information accessible?

Four Factors for
Social Transparency
Assessment

Transparency Recipients
- Do the recipients depend on information providers?
- Is the information valuable for the recipients?
- Is the information consistent with the recipients' work?

Transparency Presentation
- Is the information interpretable for the recipients?
- Is the information easy to understand?
- Is the format of information compatible with recipients preferences?

FIGURE 10: FOUR FACTORS FOR ASSESSING ONLINE SOCIAL TRANSPREMNCY

4.3.2.1   FIRST FACTOR: THE CONTENT OF TRANSPARENCY

The first essential factor in assessing transparency between organisational actors is the type of visible information. It was discussed earlier that the content of transparency is a key aspect of transparency processes. Enterprises use transparency as a kind of information sharing approach to raising awareness of the factors that explain individual and team situations, processes, resources, rationales and decisions intending to inform the decisions made by others. Social transparency helps others to maintain mental models of their activities and avoid potential coordination conflicts. Work on situational awareness states that "notifying members of actions on shared artefacts helps them maintain mental models of others' activities and avoid potential coordination conflicts" (Gross et al. 2005). A participant in our study stressed that "*implementing transparency is not enough to improve the quality of the work but the information that is revealed to colleagues who play an effective role in the improvement process*". We found that the visibility of social and work information such as employee goals and tasks in terms of activeness, degree of interest and skills in performing them, their priorities, and dependencies needed to achieve them are all important elements in the assessment of online transparency in organisational information systems. In this context, transparency assessment methods must check the content of transparency against the following points:

- Content availability

Some issues, such as work conflict or misjudgements between peers, may occur as a result of a lack of transparency about social and work information. Systems analysts should ask if the availability of certain information would mitigate these issues.

- <u>Content relevance</u>

Relevance is defined as "the extent to which information is applicable and helpful for the task at hand" *(Wang and Strong 1996)*. Irrelevant transparency amongst organisational staff may have an adverse impact on the level and quality of collaboration between them. Therefore, customising the content of transparency can deter the occurrence of potentially associated issues.

- <u>Content accessibility</u>

Providing relevant information is not sufficient to make transparency effective. The information must be accessible to the intended actors in their different contexts or work to enable the decision-making process. For example, textual and browsable information is practically inaccessible to someone who is driving.

4.3.2.2   SECOND FACTOR: THE PRESENTATION OF TRANSPARENCY

The presentation of information refers to the extent to which information is understandable and readable by the intended user (Lee et al. 2002). It is one of the main challenges of communication within enterprises. In the focus groups, it was emphasised that organisational staff might come from different backgrounds, locations, and education levels and have various cognitive abilities and preferences. Such diversity highlights the importance of presenting information in an interpretable, easy to understand, consistent and compatible format to the recipients. Some participants emphasised that "*transparency should produce information that is compatible with the recipient's cognitive skills and context*" (F2.1). The presentation of transparency differs according to the ability of staff to process information for their purposes.

The study revealed that the information can be presented in different formats, such as verbal or visual. The verbal format can be written text as *"using the auto-reply email to inform others what is on hand without too many details" (F1.8).* The visual format of the information can be pictures, charts, graphs or progress bars. For example, *"sharing work progress with colleagues and manager by using the progress bar or grant chart or any format that shows the progress from zero to number" (F1.7).* Information can also be **quantitative** or **qualitative** information based on the recipient's needs and requirements. Some participants stated that people might feel motivated if they know the quantity of work someone needs to perform. Based on scenario 2,*" the lecturer can motivate his/her assistant to*

mark the assignment by informing him/her that he marked 90 papers and he needs to mark 30 papers" (F1.5). It is also stated that the quality of the work affects collaboration and motivation, especially if there is a dependency between enterprise members such as project manager and employee. Other factors such as workload and interest, can also be considered when tailoring the presentation of transparency information.

4.3.2.3   THIRD FACTOR: THE TIMELINESS OF TRANSPARENCY

Our analysis revealed that transparency is only useful if the information communicated is timed in a way that enables the recipients to bring about a positive outcome and reaches the recipients when they are ready and able to make a decision. Based on (Kahn et al. 2002), the timeliness of information refers to the extent to which the information is sufficiently up-to-date for the task at hand. We found that transparency timeliness can be classified according to the relation with the actor's activity, into three categories:

- Transparency before the activity

Unmanaged transparency or a lack of transparency before an activity may stem from issues such as disengagement or a loss of interest in the activity. Transparency before the activity means providing the roles, responsibilities, activeness, genuine interest and interdependencies related to a particular activity. For example, in the situation of scenario 2, *"students may need to know the timetable and office hours of the lecturer before they contact him/her" (F1.9, F1.3).*

- Transparency during activity

Issues such as delays in progress and stress may result from a lack of transparency about the progress achieved, the status and availability of the resources used, as well as physical or self-obstacles. Regarding the problem in scenario 1, It was illustrated that *"employee can use status feature on the website to inform colleagues if there is any delay in the task on hand" (F1.5).* From Scenario 1, it was mentioned that *"employee may inform his team about any problem that can cause difficulty to perform the task to avoid any misconception with them" (F1.4).*

- Transparency after activity

Transparency after a completed activity may be practiced for learning and improvement such as voluntary feedback, performance clarification, and activity shortness. However, late transparency after an activity may reduce motivation, create a bad impression or result in misjudgement between organisational members. This aspect was discussed generally in the focus group. Some participant

commented on the important of the timely transparent after activity to respect the value of the person and avoid issues such as misjudgement between members. Participant F1.2 stated that "I felt disrespectful when I know that my colleague got a feedback about his work although we send our work together". The risks related to this factor will be discussed in detail in the next chapter.

- Real-time transparency

Before, during, and after the activity, organisational members may need real-time information that helps accelerate the decision-making process. For example, in scenario 2, some participants recommend to *"use auto-reply feature to inform students that the lecturer is busy now and they may expect delay in the responses or to give alternative way to communicate him/her"* (F1.2). However, issues such as distraction and a loss of interest may result from untimely transparency. These issues will be discussed in detail in the next chapter.

- Frequency of transparency

Similar to real-time transparency, transparency can be undesired if it is practised randomly and with no static frequency. For example, in scenario 1, participant F1.2 stated that reliability between team members may result from a collective agreement for the frequency of individual transparency between them (e.g., sharing progress achievements at the end of the day).

4.3.2.4   FOURTH FACTOR: THE RECIPIENTS OF TRANSPARENCY

Social actors in the enterprise information systems may communicate their own information online and on a voluntary basis. Information recipients have various social and work dependencies with the provider, and they come from different ethnographies, skills, interests, practical background and experience. It is noted that transparency should be customised based on the role of the recipients and their inter-relationship with the information provider. The researcher found that the differences amongst the recipients are related to practical and cognitive accessibility to the communicated information. This factor focuses on identifying actors who have to receive a certain type of information. Checkpoints on this assessment are based on the level of dependency amongst actors, the value of the information to the recipient and the consistency of information with the recipient's work boundaries.

One participant commented that *"in order to avoid ethical issues in the workplace, transparency should reach to the right member" (F1.1)*. The researcher found that transparency must be customised based on the role of the recipients and their dependency relationship with the provider. For example, in scenario 1, *"a project manager required transparency about the overall progress of the team while*

a team leader required transparency about task priorities and task interest in order to coordinate the overall performance" (F2.3, F1.5). Moreover, it was found that the information provider has to consider individual differences such as goals, tasks and skills, background, experience, interest in these goals and tasks. The diversity amongst recipients will also be essential in assessing the other three factors, *content*, *presentation* and *timeliness*. Risks regarding these aspects will be discussed in the next chapter.

4.4 THREATS TO VALIDITY

Although the principle in conducting qualitative approach was followed carefully, the study in this chapter still have some threats to validity:

- In the focus group study, participants were academic and enterprise members from organisations in Bournemouth, UK which might produce a population bias because individual's point of view in relation to social transparency can be affected by several organisational, social and cultural factors.

- A common threat to validity in the focus group study is whether all participants perceived the questions as intended. In this stage, the concept of social transparency can be mixed up with other concepts such as privacy and secrecy. Therefore, this issue was addressed by providing scripts that went through iterative revisions and modifications by two research members to ensure clarity. It also checked by conducting a pilot study with an ordinary employee who has no prior knowledge about the research problem.

- The focus group has not involved managers and system analysts, which may produce a bias in the results. Moreover, the number of the scenarios used in the focus group may not cover all the aspects of online social transparency. To overcome this limitation, the researcher conducted a follow-up interview to investigate further the aspect and the potential consequences.

4.5 CHAPTER SUMMARY

This chapter discussed the result of the first empirical study in this research. Two focus groups have been conducted to investigate the online social transparency in the enterprise. This study resulted in exploring the use of social transparency and the basic factors in assessing online social transparency. The next chapter will discuss the results of the second study that explore the risks and risk factors of the ad-hoc practice of online social transparency.

5. ONLINE SOCIAL TRANSPARENCY: REFERENCE MODEL

This chapter presents the findings of the second study conducted to explore the various viewpoints of practicing online transparency in organisational information systems and the diversity of potential risks that may occur as a result of unmanaged online transparency. This chapter describes the goal of the study, the data collection method, the data analysis method and the themes extracted from the study.

5.1 THE GOAL OF THE STUDY

Online transparency can be seen in the display of staff information in staff profile, interaction via email, and individual progress bar within teamwork. The findings from the first study were used as foundation for further investigations. This study was conducted for two purposes:

- To confirm the findings related to the assessment model, described in section 4.3.2. The transparency assessment model was built based on discussion of written scenarios. Therefore, we enclosed questions in relation to this model to confirm the findings from real personal experiences.
- To explore the risks related to unmanaged online social transparency. Risks of social transparency were implicitly discussed in the first study and the provided scenarios controlled them. Therefore, this study aims to explore the risk of transparency from professionals' experiences and different work environments.

5.2 DATA COLLECTION METHOD

The investigation in this chapter involved interviews with employees who had practical experience of online transparency in their workplace. To enrich the results with diverse opinions, interviews run through two stages. The first stage was with employees from different workplace environments such as universities, small companies, and call centres. Ten employees agreed to participate in this study, four females and six males. The second stage was with professionals with a managerial role in the organisations. Five managers from various levels of management participated in this study such as project manager, call centre manager, team leader and supervisor. Diversity in gender was also considered in the second stage, with two females and three males. Table 4 shows the roles and genders of the participants.

Participant No.	Gender	Organisational Role
P1	Female	Head of client engagement in digital company
P2	Male	Dean of Media department
P3	Male	Software engineer in customer support department in Google
P4	Female	A member of call centre department in technology-led business process services company
P5	Male	Principle academic
P6	Male	Senior lecturer in computing
P7	Male	Test specialist in IBM
P8	Female	Mechanical engineer
P9	Male	Trained worker in medical robotics
P10	Female	Software engineer in Software development company
P11	Female	Senior lecturer
P12	Female	Investigative Journalists
P13	Male	Software engineer in software development company
P14	Male	Big data engineer in Dig data consulting company
P15	Male	Software engineer in renewable energy sources for local enterprise

Participants were sent an invitation to include a research information sheet to describe the aim of the study, the plan of the study and why their participation is valuable. Participants who agreed to take part in the study were provided with a consent form to make informed decision to participate in this study and they can withdraw from the study at any point. The participants agreed to record the interview for transcribing purposes.

Before conducting the interview, participants were provided with one scenario to immerse them in the context of the research. At the beginning of the interview, participants were asked five questions to ensure their fitness for the study. The questions seek their age, gender, role in the organisation, their experience of online transparency, and examples of transparency from their real experiences.

A semi-structured interview with 11 questions was used in this study to explore diverse opinions about assessing online social transparency and the potential risks that might emerge as a result of unmanaged transparency. As a result, a total of 599 minutes of the interview were recorded. The average of the interview was 42 minutes, the shortest was 21 minutes and the longest was 60 minutes.

Our study investigates the research question regarding the conceptualisation of transparency level in terms of content, quality, and risk factors of specific modalities of transparency implementation in the workplace. The interview was transcribed verbatim to support further analysis. We used a thematic analysis approach through coding the content and grouping the codes into themes. For each interview, the researcher identified the participants' views on the negative consequences of practicing social transparency and the concerns they have around it is affecting their role, social dependencies and actions. We analysed the interview data and expanded it until we reached the saturation point after interviewing 15 participants. Appendices 11.3.4 and 11.3.5 show example of one of the transcribed interviews and its thematic analysis.

5.3   RESULTS

In order to understand transparency from organisational domain, one essential prerequisite is to identify how transparency associated with the socio-technical structure of organisational information systems. The identification of this association facilitates the assessment and evaluation of transparency between organisational actors. The literature of information systems analysis and design include various research on transparency and proposed several approaches to understand and evaluate transparency such as using *i** model to elicit transparency requirements *(*Cysneiros 2013*),* proposing argumentation framework to capture transparency-related requirements *(*Serrano *and do Prado* Leite 2011*)* and developing framework based on time dimension to coordinate transparency of knowledge sharing in the organisations (Økland et al. 2010). However, the literature lacks an approach that evaluates the transparency level explicitly and its side effects in organisational context. This lack of knowledge makes it difficult to determine the technological solutions that suit organisational needs. In the literature, some key elements are missing, which is essential for the evaluation of transparency. Some of these key elements are mentioned in section 4.3.1.2 in Chapter 4, which are related to the subject of transparency. Moreover, there are some key elements in relation to the goals and the risks of transparency. The goal of transparency is essential because it determines to whom the information be shared, the way of sharing information and the time of disclosing the information. The second element is the risk of transparency which is essential to regulate the level of transparency between

actors in the organisations. Unmanaged implementation of transparency has a chance to raise several risks between actors as it will be discussed in the following sections.

The above reasons have been considered in the building of the reference model of transparency. The reference model, presented in Figure 11, includes a set of concepts for assessing transparency in the organisational domain. The grey part of the reference model includes the concepts that have been covered by previous works of online transparency in organisational information systems. A stream of empirical works on online transparency assessment has been looking in particular at the subject of transparency, given the impact of transparency about actors and their activities on the organisational strategic goals. The following are examples of the works that study the effect of online social transparency on organisational goals:

- Disclosure of good and bad information motivate employees and improve performance and productivity (Brandes and Darai 2017).
- In a socially transparent system, it will be easier for users to carry on coherent discussion, to observe and imitate others' actions, to engage in peer pressure, to create, notice, and conform to social conventions (Erickson and Kellogg 2000).
- Making co-workers more visible and letting them aware when someone on the team acted on a joint project would encourage participation and promote collaborative work (Stuart et al. 2012).
- A site like GitHub visibility showcase software developer' work history traces in a variety of formats that give insight into their past behaviour and areas of expertise which can be a source of learning (Dabbish et al. 2012).
- Transparency of own work process would provide a reasonable basis for reputation even if an individual behaved differently across specific interactions (Anderson and Shirako 2008).

While some reference models were proposed to manage transparency in information systems (Hosseini et al. 2018b), risk factors and risks were not the focus.

5.3.1   THE GOALS OF ASSESSING ONLINE SOCIAL TRANSPARENCY

The researcher found that enterprises assess transparency to tackle certain issues and to provide opportunities. The reference model in Figure 11 presents three needs for assessing transparency in the enterprise information systems.
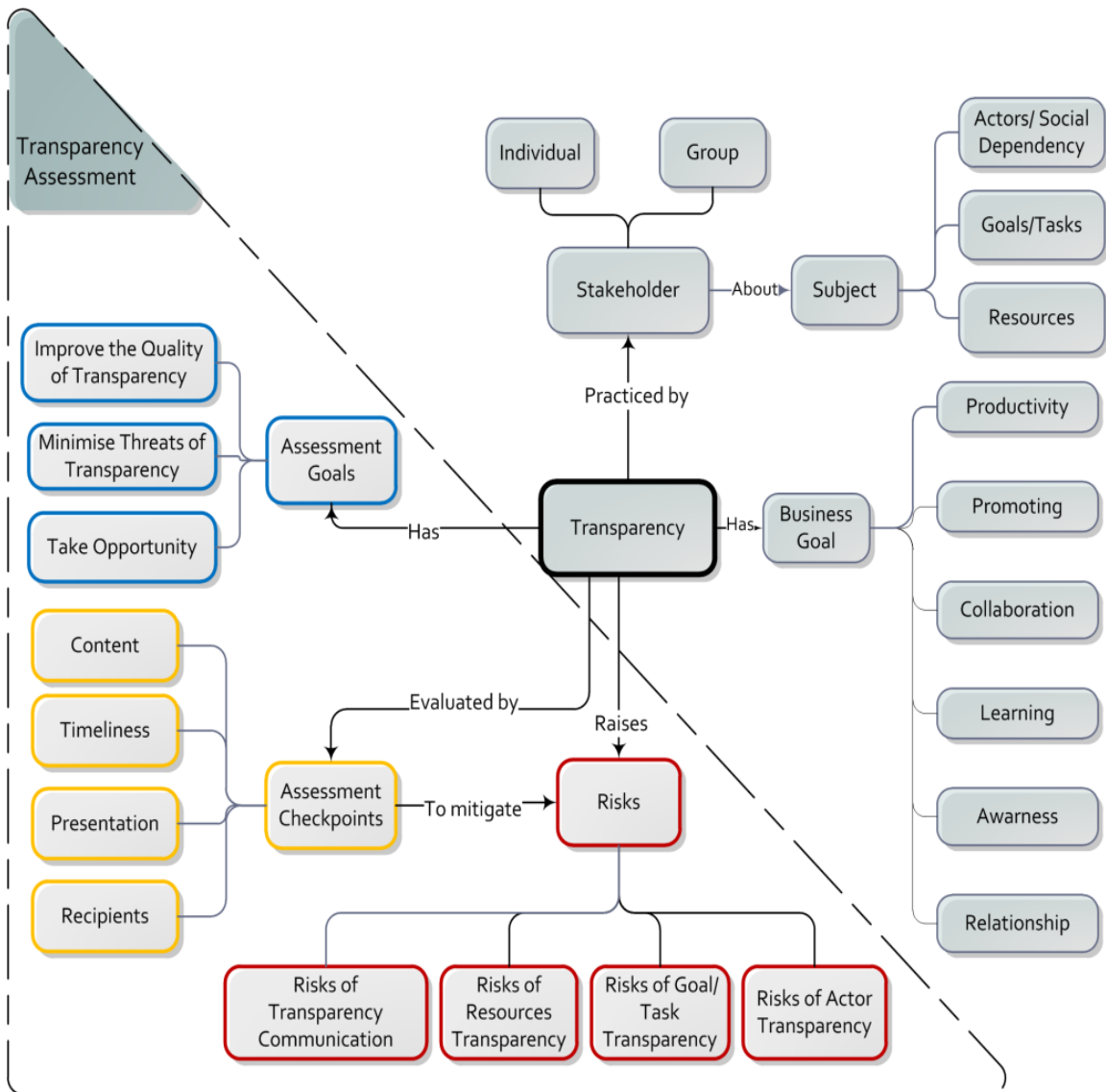
FIGURE 11: A REFERENCE MODEL FOR ASSESSING TRANSPARENCY IN ENTERPRISE INFORMATION SYSTEMS

1. Improve the quality of transparency implementation

Transparency is implemented in order to enhance the openness culture amongst enterprise actors and create a harmonious workplace. However, random and weak implementation of transparency erodes its ability to support workplace harmony and create an opportunity to raise issues such as information leakage, information overload and privacy violation.

2. Minimise threats of transparency

Various transparency threats relate to actors' intentions, goals, and tasks. For example, transparency about real-time performance data can be seen as unwanted pressure and threats for people who prefer to schedule their tasks their own way. Other transparency threats result from a lack of transparency about an actor's work-related boundaries. Enterprises need to assess the level of

transparency to avoid potential threats such as corruption, stressful competition and low productivity. We reiterate here that our work is focused on voluntary transparency and not that enshrined by the job contract.

3. Take opportunities

Enterprises use social transparency to support and enhance various opportunities to improve the quality of work, reputation, and consumers trust. An example of opportunities in the workplace is enhancing collaboration amongst social actors. One of the participants stated that they select others to collaborate within a task based on the visible information about those acquaintances' abilities in similar tasks. One of the examples in the interview revealed that a project manager recruited a junior developer after a voluntary declaration of his history of activities and time taken to accomplish them. Social transparency also provides an opportunity to learn from work acquaintances. For example, transparency regarding activities designed to achieve goals was seen as a learning resource by the participants. Transparency can also foster social learning within the enterprise which relates to attitude and behaviour (Lee and Lee 2018).

5.3.2   THE RISKS AND RISK FACTORS OF ONLINE SOCIAL TRANSPARENCY

The researcher found that limitations and flaws in the quality of online social transparency as a content and delivery method can lead to side-effects. The identification of risk factors is an important step in the design of the assessment method to manage the level of transparency. As previously mentioned, our analysis was based on goal modelling which is used for sociotechnical systems analysis and design. Therefore, four categories of risk factors have been recognised and they are related to the provision of information for actors about goals, tasks and resources. In the following sections, we list both (i) risk factors and (ii) exemplar risks, as presented in Table 5 and Table 6 (written in *italics* and <u>underlined</u> text).

- **Actor-related risk factors**

In an enterprise information system, actors are defined as active and autonomous entities that aim to achieve their goals by collaborating with other actors (Franch et al. 2016). They may be human, organisational, or technological entities. The analysis was focused on the transparency between human entities as individuals or groups. Transparency through online platforms, such as ESS in a collaborative workplace, allows actors to disclose information about their names, gender, age, skills, experience and achievements and also how they perform in certain tasks. While it usually aims to

enhance the relationship between actors, we found that this could pose the following risk factors that may lead to diverse effects in their wellbeing, relationship and performance.

Actor performance factor: Online transparency of actor performance, e.g., using a progress bar to show the progress made in certain tasks, may have diverse effects on the level of collaboration between actors. Progress in some tasks depends on the length of their practical experience and knowledge background. *Comparing staff performance* can result from unmanaged transparency. In a collaborative workplace, transparency regarding performance may create comparisons with highly qualified staff and can result in *tension* and *lower self-esteem* among less productive employees.

TABLE 5: FOUR CATEGORIES OF RISK FACTORS

Category	Risk factors
Actor-related risks factors	Performance
	Demographics
Goal/Task-related risk factors	Status
	Priority
	Duration
	Dependency
	Interest
	Progress
Resource-related risk factors	Availability
	Ownership
	Accessibility
	Status
	Sufficiency
	Outsourcing
	Value
Communication-related risk factor	Relevance
	Timeliness
	Presentation

TABLE 6: EXAMPLES OF SOCIAL TRANSPARENCY RISKS

Examples of risks
Comparison
Tension
Low Self-Esteem
Conflict of Interest
Competition
Clustering
Unfairness
Employees Turnover
Lack of Collaboration
Disturbance
Stress and Pressure
Delegation Responsibility
Goals/Tasks Conflicts
Lack of Engagement
Loss of Interest
Less Commitment
Social Loafing
Resource Conflict
Privacy Violation
Intimidation
Extortion
Delay In Progress
Information Overload
Distraction
Low Performance
Low Motivation

Online transparency such as transparency in ESS can be accessed by different actors in the enterprise which may cause a *conflict of interest.* For example, a member of a team may share difficulties regarding doing certain tasks to seek help but other members may use this information to report to the team leader about his/her performance. It also has a high possibility of causing *counterproductive competition* and *malevolence* amongst actors who have the same level of experience and background which in turn affects their productivity.

Moreover, there is a risk of creating *pressure* as a result of displaying an actor's performance to all members in the workplace. For example, one of the participants mentioned that their company uses screens in each department for monitoring purposes of tracking staff performance in their assigned tasks. However, using these screens create pressure on the staff because they feel monitored by all members of the department.

Actor demographics factor: As previously mentioned that the enterprise social software is one of the online platforms that are used to implement transparency in enterprises. Applying transparency in organisational information systems may allow staff to share information about their profile (e.g., name, gender, age, and personal image), interests, skills, capabilities, and background in relation to certain goals and tasks. Sharing personal information may *cluster* people in symmetric groups. Joining a group of people who share the same interests, level of ability and skill can be seen as an advantage to the workplace. However, the risk of creating an *unfair workplace environment* by isolating certain staff can reduce individuals' productivity and *increase employee turnover*. Staff with the lowest level of skill or the least knowledge in certain tasks may leave the organisation if they do not benefit from highly qualified staff.

- **Goal/task-related risk factors**

Based on the GORE model (Franch et al. 2016), goals represent a work-related state that is sought to be achieved and tasks represent an activity that executed to attain certain goals. Goal and tasks are delineated by actor boundaries and fulfilled in collaboration with other actors through dependencies. In some enterprise social software, actors are transparent about their goals and tasks but not the intention to attain them. Due to the similarity of the goal and task intentions, our analysis revealed crosscutting factors related to actors' intentions to attain their goals and tasks. However, we found that transparency in relation to these factors could result in certain risks arising.

Goal/task status factor: We defined status as a property that indicates the current condition of the goal or task at hand. Status shows whether a goal or task is active or inactive for other actors. Online

organisational platforms provide an opportunity to share the status of the goal and the task to encourage collaboration amongst actors. However, we found that risks associated with a _lack of collaboration_ can stem from a lack of transparency about the activeness of the goals or the task. We also found that a lack of transparency about current task status may increase the level of uncertainty and cause an _undesired disturbance_ in the workplace. In the context of collaborative goals and tasks, we found that unawareness of the status may create _stress_ for actors who depend on these goals or tasks.

Similarly, transparency about goal and task status has a high probability of increasing risks in collaborative workplaces. Excessive transparency about the active goals can create _stress_ and adversely affect the quality of performance because it can _pressure_ collaborators to furnish the required resources and synchronise tasks with others according to their timing. We found that transparency of task status with actors who depend on the outcome of another task may cause a risk of _delegation responsibility_ to other members. For example, a team leader depends on a member to write a report but that member shared that the currently active task involves designing a prototype, the leader delegates the report, thereby adding to the workload of another member.

Goal/task priority factor: One of the main reasons for ethical and wellbeing issues in the organisational information systems is the conflict between employee interests and plans (Ayoko et al. 2003). In organisations, _conflict of goals and tasks_ can occur as a result of a lack of transparency about their priorities. For example, a mechanical engineer may be working on two different projects with two different teams. Both teams have different priorities for their goals, but they do not share this priority with the engineer, and they expect the engineer to dedicate all his time to their work. This may create a conflict of goals because the engineer is not aware of the goal priority and he\she may spend more time on one goal than the other. A participant stated that "_the priority of the short term and active goals are higher in the workplace to ensure the acceleration of progress_". However, a lack of transparency about priority amongst organisational actors can risk a _lack of engagement_ and _loss of interest_ which in turn negatively affects overall performance and the achievement of the organisational goal.

Similarly, transparency of goal priority also gives rise to the risk of _misunderstanding_ and _disappointment_ among peers who collaborate on the same goal. For example, if a project leader assigns a high priority to individual goals and makes it visible to the project team then it may create _stress_ for team members who have collaborative goals with that leader. It may also make them _less committed_ to the project.

Goal/task duration factor: Goals and tasks in organisations can be classified based on the order and duration needed to achieve them into short-term and long-term. A lack of transparency regarding the duration of the goal may adversely affect the collaboration between peers. Collaboration between peers can happen voluntarily to accelerate progress. On the one hand, there is a risk of *conflict arising between goals and tasks* due to a lack of awareness regarding their durations. A participant stated that "*I prefer to be informed about the time needed for each goal to avoid a conflict situation where two goals need to be finished at the same time*". On the other hand, transparency about the duration of a goal may risk a *loss of interest* in contributing to long-term goals because some people feel motivated and committed to short-term goals.

Goal/task dependency factor: An actor's goals and tasks are fulfilled in collaboration with other actors through dependencies. A dependency is a relationship amongst two actors: a depender who relies on a second actor referred to as dependee for the accomplishment of specific tasks (Franch et al. 2016). Dependency may be established at the level of actors (one actor depends on another) or at the goal/ task level (a goal depends on another goal) (Franch et al. 2016). Online enterprise tools are able to display goals and tasks but unable to display the identity of actors in dependency relationships. A lack of transparency creates unawareness about the identity of the depender or dependee which in turn adversely affects the actors' wellbeing and performance. Unawareness about the depender's identity may cause a risk of *reduced commitment* to the assigned goal. For example, a project manager depends on the team leader to increase team productivity. A lack of transparency among team members regarding the identity of the depender (project manager in this case) leads to a lack of commitment to the goal.

Similarly, a lack of transparency about the dependee's identity has the potential to create *misjudgement* and *unfair comparison*. For example, a delay can occur if members of a team depend on outcomes from other members. A team leader may misjudge the delay in their performance if they are not transparent about that dependency.

Goal/task interest factor: The interest in a goal or a task seems to be an important predictor of actual performance (Van Yperen 2003). Interest is associated with focused attention, cognitive functioning, and persistence (Hidi 2000). However, our investigation found a negative effect of transparency of goal and task interest on co-worker performance. In a collaborative environment, we found that a lack of transparency about interest in achieving a goal or performing a task may have a negative impact on other members' interest in collaborating or providing assistance. This may increase the risk of a

lack of engagement and *loss of interest* between co-workers which may adversely affect the achievement of organisational goals.

Similarly, transparency about the level of interest in individual goals and tasks may help to stem risks in the workplace. The analysis of the study found that risk of *social loafing* whereby team members reduce their effort and rely on others to perform a task may appear as a result of sharing a high level of interest in specific tasks with other team members. In a collaborative task or goal, we found that sharing less interest in shared tasks may result in *reducing the level of commitment* of partners in that task.

Goal/task progress factor: In online transparency, progress can be presented as the status of the achievement (e.g., in progress, partially completed, fully completed) or as a percentage of the achieved work (e.g., 70% completed). We found that a lack of transparency about a goal or task progress has adverse effects on the wellbeing of actors, especially between actors who depend on each other. This may increase the level of *stress* among actors who depend on this goal or task. For example, if a member of the development team depends on the testing team to provide a defect report. The development team may experience stress if the testing team is not transparent about their progress. We also found that using a progress bar in a collaborative tool in ESS may create *unproductive competition* as members try to set their performance based on other performance rather than the team goal. There is also a risk of *unfair comparison* if progress is shared with the team leader. Transparency about reasons for limited progress may help to avoid such risks.

- **Resource related risk factors**

A resource is a physical or informational entity that is owned and provided by actors (Franch et al. 2016). Transparency about such resources increases awareness in the workplace and improves overall performance. However, the effectiveness of transparency is affected by factors related to these resources such as availability, ownership, and accessibility. In the following sections, we present the risks and the factors that relate to the resources used in online transparency.

Availability factor: Risks amongst actors can stem from a lack of transparency about resource availability. A lack of transparency about resources makes actors unaware of the status of the resources between them (Li et al. 2014) and diversely affects actors' expectations and their overall performance. A lack of transparency about the availability of physical resources may lead to the risk of a *lack of engagement* in specific tasks. One participant commented that *"companies may advertise for a certain task to encourage employees to engage, but a lack of transparency about the availability*

and sufficiency of the needed resources such as software may adversely affect employees' *engagement"*. Moreover, we found that the risk of <u>resource conflict</u> can result from a lack of transparency about resource availability because resources may be allocated to various activities' schedules at the same time. In terms of informational resources, risks such as a <u>lack of commitment</u> may occur from a lack of transparency about information related to actors' goals or tasks. For example, team members depend on the project manager to provide information about project updates and progress. A lack of transparency about the project may reduce actors' commitment to the project plan. <u>Stress</u> and <u>pressure</u> are other risks that may result from the unavailability of information about a project's progress.

Ownership factor: Jarvenpaa and Staples (2001) found that actors who are associated with resources and who have worked on resources or whose identity is tied to the resources are all seen as having ownership of the resources. Actors have self-ownership when they are the only owner of the resource, such as personal documents, whereas they have collective ownership when they own shared resources with other actors such as reports of a team's progress. The researcher found that an ethical issue such as <u>privacy violation</u> can be raised as a result of transparency about collective resources. For example, a report of teamwork is a collective resource that includes information about the progress of team members. A participant stated that transparency about peers' resources might have an adverse impact on their wellbeing because this information can be used for <u>intimidation</u> and <u>abuse</u> purposes if it reaches an improper person.

Accessibility factor: The results of our analysis revealed that transparency about the identity of actors who access a particular resource affects the wellbeing of actors who use that resource. For example, declaring that the project manager can access the team enterprise, social software may increase the level of <u>stress</u> and <u>pressure</u> on the team members. We also found that transparency about this kind of information creates <u>counterproductive competition</u> amongst team members because each member sought to create a good impression of their performance.

Status factor: This factor represents the condition of the used resource. In a dependency relationship, a lack of transparency about the status of the resource may result in a <u>misjudgement</u> about the actors' performance. One participant stated that "*Transparency about the old version of the used software made the manager aware of the reasons that hindered the team's progress*".

Sufficiency factor: One of the main problems facing actors while working is insufficient manpower and physical resources. In our study, we found that a lack of transparency about the sufficiency of resources may lead to a <u>lack of engagement and collaboration</u> in certain tasks. One of the participants

in our study was invited by his manager to collaborate in a project but he did not engage in the project due to a lack of awareness about the number of people in the project.

Outsourcing factor: This occurs when one actor contracts with an external actor to provide resources about a certain task or goal. Outsourcing is one of the main risks that affect employee wellbeing and performance. For example, a risk of *reduced trust and employee displacement* may occur due to transparency about outsourcing with external actors. Also, transparency about outsourcing to provide resources may increase the risk of *extortion* if the outsourcing is seen as abnormal and misaligned with the enterprise's culture and norms.

Value factor: Resource value represents the importance of the resource to the actor who owns and depends on that resource. The importance of the resource relates to its economic or functional value. We found that a *lack of commitment* to provide certain resources such as a technical report may result from a lack of transparency about the functional importance of the resource to the requester. Moreover, *progress* may be delayed as a result of a lack of transparency about the resource's importance.

- **Communication-related risk factors**

Our focus group study revealed the importance of assessing transparency communication as a cross-cutting aspect to the content, presentation, timeliness, and recipients. In this section, this aspect is elaborated using the interview study and reveal risk factors and risks related to transparency communication.

Relevance factor: It is defined as "the extent to which information is applicable and helpful for the task at hand" (Wang and Strong 1996). Information is relevant when it is appropriate to the user's expectations (Tu et al. 2016). Irrelevant transparency amongst organisational staff may hurt the level and quality of collaboration between them. Moreover, information may cause *information overload* for the recipient if it is out of date or inconsistent with the recipient's needs.

Moreover, the sender may be abused if an improper person accesses the information. We also found that transparency of irrelevant information increases the level of *distraction* and *disturbance* in the workplace. Therefore, customising the content of transparency can deter the occurrence of potential associated risks. For this reason, the level of transparency can be evaluated within the context of the goals and tasks of recipients such as location and task type.

Presentation factor: This aspect emphasises the importance of presenting the information in an interpretable, easy to understand, and compatible format to the recipients. Risks such as _loss of interest to collaborate_ occur as a result of receiving challenging to understand information or a high volume of information. For example, a participant who is a software engineer found that when a member of the development team shares low-level technical issues with a project manager, this information may not be understandable and the manager could become less motivated to take supportive action. Moreover, a high volume of information may result in a _reduced speed of performance_ because it is time-consuming and takes longer to make a decision. While transparency is used to enhance staff motivation, there is a risk of being _less motivated_ due to the incompatible format of the shared information. For staff to be motivated, transparency processes should produce information that is compatible with their cognitive skills and context. In other words, the presentation of transparency shall differ based on the ability of staff to process information for their purposes.

Timeliness factor: Timeliness of transparency is an important dimension for improving staff performance because information reaches the recipients when they are ready and able to make a decision. However, potential risks of a _delay in progress_ and _low performance_ may occur as a result of late and the untimely sharing of information. An untimely manner of transparency can also lead to high levels of _stress and pressure in the workplace_. As we mentioned before, that delays in completing a task due to a lack of timely transparency could explain increased levels of stress and pressure. Delays occur due to the time required for information processing and making decisions and the untimely transparency among decision-makers. For example, declaring that the actor will be going on holiday after several days shall be timely in the sense of this being shown automatically to colleagues when trying to email the actor so that they do not expect their request to be actioned and they may decide to cancel.

5.3.3   THE ASSESSMENT CHECKPOINTS

In the previous sections, the researcher presents various kinds of risks that emerge in enterprise information systems as a result of unmanaged online transparency. However, the researcher found that these risks might be mitigated by evaluating and assessing the level of transparency amongst actors. In the following sections, four types of assessment checkpoints have been suggested that we will use to design and build a transparency assessment method to reduce the occurrence of its risks.

1. Content assessment

We suggest content assessment to examine (i) whether there is transparency amongst actors and (ii) whether transparency is relevant to the actor's work boundaries, i.e. tasks, goals or resources. We

found that some risks occur as a result of a lack of transparency or irrelevant transparency. Risks such as loss of interest and lack of engagement (discussed in the previous section) can be mitigated by providing information about the level of interest in specific tasks. We also found that information overload can be managed by assessing the relevance of transparency content for actor goals or tasks. We refer to the relevance of transparency as the consistency of the disclosed information with the actor's goals, tasks and demographics.

2. Timeliness assessment

This assessment examines transparency to ensure that the information is sufficiently up-to-date to the task at hand (Kahn et al. 2002). It examines transparency against the activeness of the task or goal and their durations. Risks such as delay in progress and stress may raise as a result of untimely disclosing of information. Timeliness assessment focuses on determining the appropriate time of disclosing the information in order to attain adequate transparency.

3. Presentation assessment

Presentation assessment examines the consistency of the recipients' presentation requirements and the presentation of disclosed information. Transparency is assessed to identify the format of information (verbal or visual), the level of details, and the type of information (quantitative or qualitative). Identification of transparency presentation is based on the actor's role, preferences, background, cognitive skills and experience. Risks such as lack of collaboration and low performance may occur as a result of the inappropriate presentation of information. This kind of risk can be reduced if the format of transparency and the type of information is understandable to the recipients.

4. Recipients assessment

Risks such as peers malevolence and conflict of interest may occur as a result of transparency of their own information to all members in the organisation. This assessment focuses on identifying the actors who have to receive a certain type of information. Checkpoints on this assessment are based on the level of dependency amongst actors, the value of the information to the recipient and the consistency of information with the recipient's work boundaries.

5.4 THREATS TO VALIDITY

The study in this chapter has the following threats to validity:

- The common issue when designing an interview study relates to ensure whether the questions were understood by all participants as intended. This threat was addressed through a pilot study that was conducted on a typical enterprise member. The questions

were also revised and modified by two research members to ensure clarity. The results of the pilot study were not included in the study results.

- Another threat when conducting a semi-structured interview is eliciting information from the participants that will be consistent with the researcher expectations. This may occur because the interviewer does not follow a standardised order of questions that used with all participants. The interviewer is free to adapt the interview questions, thus creating conditions to confirm his/her expectations.

  This threat was reduced in this thesis by conducting semi-structured interview with a standard set of questions that will be asked and another set of questions that may be asked to elaborate on the certain issue to cater to the different roles being interviewed. In addition, the interview study conducted in two stages based on the roles of the participants, as explained in section 5.2, to enrich the results with a diversity of opinions.

- The recruitment of the participants was based on snow-ball recruitment. Such kind of recruitment method used when is difficult to find participants. For example, if a study were investigating unacceptable social behaviour topics, potential participants would be wary of participate because of possible ramifications. However, other participants in the same workplace could inform their colleagues about the benefit of the study and reassure them of confidentiality.

  Such a recruitment method can introduce a threat of sampling bias. This threat reduced by controlling the nomination of participants by allowing each participant to nominate one of his/ her colleagues and not recruiting more than two employees from the same workplace.

- This research has mainly targeted the internal stakeholders of the organisations. While targeting these stakeholders helped in determining the different sources of risks of online social transparency, it may limit the findings to those stakeholders. External stakeholders may also affect the practice of online social transparency. For example, slack is an enterprise social software, and it enables internal stakeholders to create channels with several external stakeholders from different organisations. External stakeholders may have different views and perceptions about the risk factors of online social transparency. Involving this type of participants may lead to discovering additional risk factors in the domain of online social transparency.

5.5   CHAPTER SUMMARY

In this Chapter, the second empirical study that attempts to achieve the research aim and objectives are introduced. The adopted research method was explained in details and the results are illustrated and described. The main contribution from the interview study was the exploration of the risks and their factors that stem from the unaware practice of social transparency in enterprise information systems. The findings in this chapter contributed to providing a reference model that use as a base for the assessment process. In the next chapter, these findings will be investigated from real organisational context.

6. ONLINE SOCIAL TRANSPARENCY: RISKS CATEGORISATIONS

In the light of the findings in chapters 4 and 5, this chapter explains the qualitative studies that were conducted in order to further explore the risks and their factors of social transparency in enterprise information systems and confirm they exist in real context. The chapter explains the research methods that were followed in both studies and the results reached from both of them. The study in this chapter consists of two phases including observation study in two companies and interviews in the first phase and two focus groups in the second.

6.1 THE GOAL OF THE STUDY

This chapter followed a multi-staged qualitative study to confirm and refine the findings with regard to the risks of unmanaged online social transparency in the context of real organisational information systems. This study also included a focus group to enrich the results with a diversity of opinions originating from various perspectives such as managers and employees.

6.2 DATA COLLECTION METHOD

The investigation in this chapter involved two phases: personal observation, informal interview and document analysis followed by a focus group in two multicultural companies. Various digital features are used for communication in the selected companies such as emails and special enterprise social software (ESS). The following elaborates on the procedures of the two phases.

- **First Phase: Observation study**

  For the aim of this chapter, the researcher conducted a two days observation study at two multicultural companies. The observation was aimed to further explore the risks of social transparency in existing enterprise social software. The company uses social networking software named Slack for tracking progress, managing employees' collaboration and improving overall performance. Table 7 presents a review of these enterprises and their social networking software. The observation allows the researcher to view the enterprise social software from different employees' accounts and monitor their behaviours and interactions with each other. A short interview with an employee was conducted after observing his/her behaviour and interaction with the software. The researcher also reviewed some of the documents shared through the software. The researcher reviewed these documents to understand the reason for employee behaviour when receiving the shared documents.

Analysing the observation notes, the interviews and related documents were used to support the preparation for the second study.

TABLE 7: DESCRIPTION OF THE COMPANIES IN THE OBSERVATION STUDY

	Company 1	Company 2
The scope of the Company	Big Data Consulting	Software Development Outsourcing
Software	Slack	
Overview of software benefits	- A messaging software has one platform for all employees' communications. - It offers real-time messaging, file sharing, archiving and search. - It allows employees to communicate with the entire organisation which result in better conversation and knowledge sharing and avoiding corporate isolation - It is a team communication and messaging tool. The software used to create profiles, sending messages, sharing files and scheduling events.	- It is an open channel for feedback through comments, likes and reactions. - It designed to promote employees engagement such as running polls and recognising colleagues in new feeds with a Gif or reaction.
Software Features	✓ Conversation Channels ✓ Private groups ✓ Messaging ✓ Messages history ✓ Search ✓ Snippets ✓ Collaboration ✓ File sharing ✓ File browsing ✓ Voice / Video calls ✓ Feedback ✓ Progress archive	✓ Notifications ✓ Integration ✓ Synchronisation

- **Second phase: Focus group study**

After the observation study in the site of the companies and reviewing their social networking software and related documents, the researcher conducted one focus group in each company. To enrich the results with diverse opinions originating from various perspectives, participants with managerial roles and employees were involved. As a result, ten employees from two companies participated in two focus group studies.

Participants were provided with a research information sheet that describes what the aim of the study is, what to expect from the research, why their participating is valuable, and how the study is planned to be conducted. In addition, they have been provided with consent form stating that their identities will be anonymised and not identified in the research results, the session will be recorded (audio record) for transcribing purposes only and the participants can withdraw from the session at any point.

The focus group included two activities: (1) Discussion of the observed behaviour in the two companies. Participants were provided with two scenarios and a sketch of a goal model for discussion purposes. The scenarios and the goal model built based on the observation in the two companies. Several questions were designated to seek opinions on the risk of online social transparency on employees and organisational information systems with regards to the given scenarios. (2) Open card-sorting activity to organise the risks of online social transparency into groups. The card sorting aims to confirm and refine the findings with regards to risks of online social transparency on employees' wellbeing and performance. The card sorting activity included risks generated from participants' answers and risks founded in chapter 5. Each focus group lasts for two hours, and their records were transcribed for thematic analysis and further clarification. The analysis of the observation study, interview and card-sorting study reveal further themes that can be important in assessing the risks of online social transparency. The materials used in these focus groups are available in Appendix 11.4.5

6.3   RESULTS

The observation and the followed-up studies focused on risks of transparency caused by issues related to the delivery of the information which includes the content, timeliness, presentation and intended recipients. By analysing the observation notes, short interviews and the participants' answers form the focus group. The researcher identified the features of online platforms that might result in the occurrence of risks in the digital form of transparency, categories of online social transparency and risks stem from online social transparency that grouped under various categorisations. Risks categorisations differ based on various contexts such as the level of transparency, communication style, impact on welling and performance. The following sections detail the results of the observation study.

6.3.1   PECULIARITIES OF ONLINE SOCIAL TRANSPARENCY

We understand transparency as personal insights into each other's activities and resources. Social transparency applied in enterprise networking software to enable individuals to be aware of the work of others within a workplace environment and to make them available to each other as resources for their activities (Dalsgaard and Paulsen 2009). In this section, features of online social transparency were identified. These features make online form of social transparency different from face-to-face and other dissemination methods adopted for social communication amongst organisations members. Considering these features makes it necessary to revisit the established principles and knowledge about transparency to reflect its new manifestation when hosted and facilitated via online spaces. In the following, we list these features and elaborate on the peculiarities they introduce to transparency and its management.

- **<u>Archivability</u>**

Transparency through online platforms has archivability feature that creates a searchable history of information that is disseminated and exchanged amongst different parties. Considering this feature in the assessment process of online social transparency helps systems analysts, systems engineers alongside with managers and employees to search through a massive volume of archived information to examine the causes of certain kind of risks that stems from sharing social information. For example, a participant who is a project leader found that when people are transparent about their emotional state, risks like emotion contagion could be detected through data mining.

- **Traceability**

Applications that support online transparency may have a feature that records all changes that happened on the original version of the information. One participant stated that archivability feature of these applications aids managers as well as employees themselves to mitigate the risks stems from social transparency, such as misunderstanding and denial, by tracing back to find the source of information and the changes that made to it to detect the reason of the risks.

- **Trackability**

Transparency through online platforms enables individuals to track their information and its outreach to ensure its delivery to all intended members. Some participant stated that trackability also allows information senders to know who received or looked at their information, which in turn helps them to set their expectations or control their next transparency activity. From a system analyst's perspectives, "*considering trackability in the assessment of social transparency may help in predicting the potentiality of risk occurrence*".

- **Real-Time**

Unlike face-to-face communication and other classic dissemination methods, communicating transparency through online platforms can provide instant and real-time information. The time dimension of transparency is one of the crucial factors that need to be considered in designing transparency for situation awareness purposes. In the workplace, maintaining real-time social awareness of the co-workers' context is important for successful cooperation (Chen et al. 2014). For example, most of the participants agreed that "*declaring employee's current status in an auto-reply helps colleagues to avoid disturbing them and finding alternatives such as getting assistance from another employee or booking other time slots*". The real-time nature of online transparency may also save time and avoid potential delays that may happen in the workplace but can also introduce risks around pressure and Hawthorne effect.

- **Mobility**

Online transparency is scalable and can serve distributed groups, staff, departments, or organisations and can be accessed through various mobile and stationary devices and applications. Participants who work in a company that has three overseas branches state that "*the number of mobile workers continues to grow in their organisations where employees are located in distributed departments or working from home*". Participants in our study emphasised the role of online transparency in facilitating collaboration with colleagues who work remotely. The mobility of accessing online transparency can be considered in the assessment process of online social

transparency to mitigate risks that may happen for distributed employees such as misjudgment and misconception in their progress.

- **Open Accessibility**

Online transparency in organisations has the ability to reach the widest number of staff at the same time. This feature of online transparency shows its significance in saving the time of disseminating social information in large organisations. For example, one participant state that *"transparency in public channel in Slack can be accessed by all members of the organisation which can be useful from effort and outreach perspective but also risky in terms of retractability and potential abuse and intimidation"*.

- **Unchangeability**

Some participants claim that the unreliability of face-to-face transparency and other forms of disseminating it such as newsletters and announcements, result from the distortion that often happens on the information as it travels through the organisation and their different personnel. The information may be distorted unintentionally by various contexts such as employees' mood, cognitive ability, ethics, time and location. Social transparency, as we defined in this work, is related to individual intentions and their socially related information. Technology allows individuals to disseminate such information directly to other members and avoid distortion occurred through the involvement of different parties.

- **Presentation Adaptability**

Transparency through online platforms has the flexibility to present the information in different formats (text- audio- video- graphics) and different time slots based on the recipients' preferences. Providing transparency in a preferable format in a context-sensitive manner (e.g., audio while driving) allows better communication and comprehension of it. One participant mentioned that "good presentation of online transparency helps to eliminate situations where recipients ignore the information due to its complexity and recipient's busyness". It is stated that inappropriate presentation of online transparency can also introduce risks of incorrect contextualisation and personalisation. Such processes would also require sensing infrastructure and historical data about staff and their dynamic environment to build their user model and know their preferences.

- **Selectability**

Online transparency was generally preferable amongst the participants due to its selectability feature that allows them to select the information that suits their interests, skills, goals, tasks and time

availability. Using filtering features or creating private channels in Slack enable recipients to customise others social transparency to benefit from related information only and mitigate risks such as information overload of unwanted information. This can be seen as user-administered personalisation and configuration of transparency.

6.3.2   CATEGORIES OF ONLINE SOCIAL TRANSPARENCY

From the studies in this chapter, we found that social transparency in the organisational information systems can be classified into four categories based on two factors: (i) the awareness of the information provider and (ii) the accessibility level of information receiver. The awareness of the information providers refers to conscious choice of the information to be visible. Thus, individuals directly provide information about the self with full consent to be visible to others. Awareness is a spectrum, and it falls between two edge cases:

- **"I revealed" case:** It refers to the deliberate sharing of individual information with consent to be visible to others. For example, staffs consciously reveal information about their current status and work progress in Slack with the purpose that this information will be visible to enterprise members.
- **"*I did not reveal*" case:** It refers to the sharing of individual information without full awareness of the sharing action itself or the audiences of the information shared. For example, a team leader shares information about their team in another private channel, where members are not aware of that. Another example is about sharing location data and not being aware or able to predict whether this might be occasionally re-shared by others.

Regarding the second factor, we found from observing the use of Slack that online social transparency sharing can be classified into two kinds based on the accessibility level by enterprise members.

- **Open accessibility:** In which information is accessible by all individuals in the workplace. Public channels in Slack is a typical example where others can see the activities, availability, interest, progress of their colleagues and their location.
- **Regulated accessibility:** In which information is limited, deliberately or due to connectivity and contextual barriers, to a set of individuals in the workplace. Group conversation and private channels are typical examples.

Based on the two dimensions of awareness and accessibility, we found the four categories of social transparency:

Open social transparency refers to sharing information about the self with full awareness and also desire to be visible to others in the organisation. This kind of transparency is typically motivated by increasing awareness in the workplace, which will then positively affect the organisational goals. There are several examples of open social transparency in organisations such as staff calendar, staff profiles page, and public channels and conversations. A participant described this kind of transparency and stated that *"this can be in the form of a centralized report where everyone can access it and add information such as their workload. We put everything in one place, and everyone can look into what is my workload or other workload, how things are being managed, what the problems are"*.

Regulated social transparency refers to sharing information about the self, which reaches only specific members of the organisation. This kind of transparency regulates the visibility of individual information for various reasons, including the protection from misuse and the reduction of misconceptions amongst members. For example, sharing information about personal difficulties in private channel that only include the teams to which the employee belongs. As stated by participant who is against the full visibility of information that *"If I use the status feature to express my feelings about the work, then this feature should have the property if I would like to share it with public or specific people in the place. The status does not say too much about the work and people may interpret the status in different ways"*.

Unconscious social transparency refers to the visibility of individual information without awareness from the information owner. This kind of transparency is one of the ethical issues in the workplace as colleagues may share personal information about an individual without their knowledge. We emphasise here that social transparency has loose contractual settings and access control and relies mainly on personal judgement and organisational and cultural norms. For example, a member of a team may share information about difficulties and their peers' weaknesses or peer's progress in a collaborative task with other teams aiming for external support. Such transparency seems unavoidable even in an ordinary social environment but still undesired as it has a diverse impact on the collaboration between organisational members. A participant highlighted that *"it happened in the joint work when people want to jeopardise the progress or displacing colleagues form their assigned tasks."* It was declared that *"Not all work relationships can be positive; some may use the shared information for their benefits such as displacing colleagues form their assigned tasks"*.

No social transparency refers to the situation where enterprise members are not sharing information about their activities stream, progress, and interest in specific tasks or their relationships with other colleagues. We found this case more in new members who still have not built a trust relationship with peers and management and confidence in their role and contribution to the group.

6.3.3 RISKS ASSOCIATED WITH ONLINE SOCIAL TRANSPARENCY

Our results from the first and second stages of the study indicated that risks are related to the delivery of the information in four aspects: content, timeliness, presentation, and intended recipients [3]. The results of our third stage confirmed our previous findings and explored other dimensions of risk factors that need to be considered in the assessment process. Our analysis grouped the risks based on their influence area into (i) performance, (ii) wellbeing and (iii) workplace environment. Two main risk factors seemed to be prominent; the level of transparency (Section 6.3.3.1) and the way it is practised (Section 6.3.3.2).

6.3.3.1 RISKS RELATED TO THE LEVEL OF TRANSPARENCY

By observing the enterprise social software in the two companies, we noted that risks might stem from transparency, excessive transparency or lack of transparency about employees' information. The level of transparency indicates whether it is adequate, abundant or unsatisfactory. The level is not only determined by the information content but is inherently dependent on the reachability, relevance and interpretability of information. In other words, it is a contextual and subjective measure, determined mainly by the audiences and dependent on their personal, technical and social context. However, in the absence of regulations in this social application about the level of transparency and the type of information to be shared in these applications, there is a high probability of stemming risks amongst the members of an enterprise. The following sections discuss the potential risks that might occur based on the level of transparency. Table 8 shows examples of risks revolving around the different levels of transparency.

- **Risks related to normal online social transparency**

In this section, the risks that may stem from the normal level of transparency are presented. This level has been identified as the required level of transparency when the audiences see the shared information as satisfactory and beneficial to certain enterprise goals and activities. It has been noticed that even if transparency is seen adequate, it might lead to a negative impact on the relationship between enterprise members and the level of trust and interest between them and may need further qualification and support with additional measures to mitigate these risks. For example, conversation channels in the slack application allow team members to be freely transparent about their information to benefit the team productivity. However, software designer claimed that *"Some members share information that they may find useful for the team, but the scale of information usefulness differs from one member to another. We had one channel for all project team and if a software tester shares how he checked certain test cases, that might be useful for another tester, but it is not useful for me"*.

TABLE 8: EXAMPLES OF RISKS RELATED TO DIFFERENT LEVELS OF ONLINE SOCIAL TRANSPARENCY

Excessive Level of Transparency	Normal Level of Transparency	Lack of Transparency
Employee Isolation	Loss of interest	Conflict of interest
Lack of collaboration	low engagement	Loss of interest
Information overload	Low innovation	Lack of collaboration
Slow Decision Making	Social Loafing	Lack of belonging
Inadequate and unprepared	Stress & Pressure	Relationship Conflict
Confusion in intentions	Low self-esteem	Annoyance
Stress	Negative impression	Lack of trust
Uncomfortable Place	Distrust	Rumours spread
Loss of concentration	Favouritism	Biased opinions
Loss of professionalism	Disengagement	Fabricated reactions
Employees Turnover	Discouraged employees	Information inaccuracy

In terms of transparency about the goals and the tasks, the researcher noted that transparency about the employee interest in certain tasks or goals has the chance to affect the impression towards his/her works negatively. For example, slack has a feature that allows each member to pin certain messages to appear all the time to all teams. It was declared that staff may use some features to remind other members about their interest in certain work to avoid any undesired requests that may interrupt their works. However, transparency about individual interest in a certain tasks or goals has a chance to cause low expectations, disappointment and misjudgement from colleagues who work in the same tasks. In the interview that conducted through the observation study, a project manager stated that *"A developer member of the team pinned a message that shows a high interest in working in software design and writing codes. However, in our project, he works with the testing team and it was not clear what his intention of this message is. So, I am worried about the progress of the project because he might be less motivated and that may affect the meeting of the deadlines."*

Another observed risk is loss of interest to contribute or collaborate in certain tasks or goals due to the transparency of their long duration to be performed. Some members confessed that they feel more motivated and committed to the tasks or the goals that need a short time to be performed. A

participant mentioned that loss of interest attributable to inappropriate presentation of information such as unreadable information or incomplete information that affects the motivation to contribute. In enterprise social software, some members may use group chat for advertising for specific goals or tasks. They advertise for these goals or tasks by being transparent about their type (i.e., collaborative or individual goal\tasks). The researcher noted from participants' answers that transparency about collaborative goals or tasks might have a risk of lack or low engagement from members who are less interested in collaborative works as well as a risk of social loafing from members who want to contribute but with the lowest effort.

In terms of transparency about individuals such as their demographics (i.e., age, gender, qualifications, and skills) or their performance, the researcher noted that transparency about staff demographic could raise various kinds of risks in the workplace. An example of these risks is the clustering of employees who are in the same range of age or qualifications. A participant who uses the workplace by Facebook revealed that *"he found transparency about age is important in the workplace because he feels more comfortable and relieved to work with members who are from the same generation"*. Another participant stated that transparency of individual performance has a chance to create a conflict of staff interest. The participant experienced this risk when he was transparent in the private group about the number of ready documents for specific tasks. He found that his colleague reported his low performance to take advantage and create a positive impression on the team leader. A participant also declared that transparency about individual performance might lead to creating unproductive competition between colleagues. Such risk can be seen when two team members with the same qualifications and experience compete to improve their self-image.

In terms of transparency about resources, it was noted form the observation that transparency about resources unavailability may raise risks such as stress, disengagement, and employee overstretching. One of the observed scenarios of group channel in enterprise social application is when one member was transparent about the old version of the used software. Software Developer in this group claimed that this transparency was untimely which affected negatively on the group plans and stated that *"This late transparency may make the team leader adds more work to our schedules until the other person can solve the problem with the used software."*.

- **Risks related to excessive level of online social transparency**

The second observed level of transparency is the excessive style of pushing the information in the enterprise social applications. Excessive transparency has been identified as the redundant and repetitive voluntary sharing of information in terms of the quantity and the quality. Excessive

transparency in terms of information quantity includes the over normal frequency of pushing the information. In terms of information quality, excessive transparency refers to the over normal length of the information content. The normal level of transparency is subjective and can be determined by the recipient of the information. It has been noted that the context of reception of the recipients might affect the subjectivity of the excessive level of transparency. Examples of these contexts are the recipient's availability, workloads, time, preferences, location, and available communication bandwidth. Context of reception defined as "the situation or circumstances in which a text is received with significant factors influencing the reading or listening of a text" (Valdez 2015).

By observing the employee activity in the conversation channels in ESS, the researcher noted that employees who are excessively transparent about their good performance run the risk of creating unwanted stress and pressure for employee who may always be thinking of how their performance impacts the team productivity. A participant who recently joined the company claimed that *"Some members like to keep us updated about their progress but that creates a stressful atmosphere because others will do the same"*. Other participants stated that excessive transparency acts as a distraction in various ways. A participant commented on his colleague's opinion about the stress of excessive transparency and declared that stress and pressure could also cause distraction of other activities to keep up with others. We noted that the distraction might happen as a result of creating a stressful employee who tracks others performance and step aside from the main tasks.

Moreover, the distraction may also happen as a result of being transparent about irrelevant information or untimely delivery of the shared information. Some employees may find themselves receiving mass emails sent to everyone in the office, and these emails include irrelevant information that distracts their thinking. A software consultant stated that *"We have been taught that being responsive on email and other communication channels is an important part of being professional but that's also cause lots of distraction through the work hours"*.

Enterprise social software allows employees to share different types of files (text, photos, videos, audios) to support employees communication, including transparency between them. The researcher noted that the excessiveness of transparency might occur as a result of sharing a large quantity of information in one file despite its relevance and delivery time. As we discussed in Chapter 5, the volume of the information is one of the presentation issues that can stem various risks, which may affect the collaboration amongst employees. The researcher noted these risks in the observed work environments in the form of loss of interest and motivation to view the shared file due to its large size. The researcher found that loss of interest may stem due to various reasons such as employee

busyness, the time to download the file, content irrelevancy to employee's interest as well as the proactive knowledge of the internet limitation. A web developer declares that *"Some colleagues used to share links to their personal blogs for the purpose to help new members to inform them about their experiences and even the good places around the city"*.

The researcher also found that the behaviour of excessive transparency can <u>isolate</u> individuals from others. It was noted that participants <u>avoid collaboration</u> with colleagues whom they practice transparency more than normal. It was stated that *"having a member with excessive transparency attitude means more unnecessary distraction which may affect the workflow of the team progress"*. Moreover, lack of collaboration may happen as a result of creating <u>information overload</u> due to the excessive transparency of information related to a person works. It was also found that this excessive transparency of information may provide inaccurate facts and figures which make an employee do their investigation and research to ensure the validity of the information. This personal investigation requires employees to process more information and add more loads to their essential works. Information overload may also <u>slow the decision-making process</u> due to the quantity of information that needs to be processed. Excessive transparency may also run a risk of making employees feel <u>inadequate or unprepared</u> when they receive too much information, particularly irrelevant information about others work. A participant stated that *"I may receive information that I do not need to know but because it sent to me, I feel like it is something I am expected to part of or to understand"*. It was also showed that too much transparency may create <u>confusion</u> about the ultimate intention of this transparency which therefore, there is a chance of <u>making mistakes</u> and <u>waste time</u> in the workplace. We noted that employees who are excessively transparent about their good performance run the risk of creating unwanted stress and pressure for employees who may always be thinking of how their performance impacts the team productivity.

- **Risks of a lack of transparency**

The third observed level of transparency in the organisational information systems is lack of transparency when there is no social information available amongst employees. This level of transparency has been identified as the unintentional and occasional holding of an individual's social information in the enterprise social software. We reiterate here that social transparency is not enforced by the organisational rules and left as a personal choice for staff. It has been noted that when there is no social transparency, it would be difficult for employees to know what is going on, why certain things are happening, and they may find themselves vulnerable, insecure and afraid of uncertainty.

This typically leads to searching for precautionary and defensive strategies and following a more conservative and less creative attitude.

In the observation study, we meant to observe situations where there is no transparency between employees and note the potential risks that may originate as a result of the absence of social transparency in enterprise information systems. It was indicated by number of team leaders and managers that lack of transparency and trust is the main reasons employee will <u>look for new teams or even new jobs (turnover)</u>. A participant indicated that *"Organisation invests on the employee by providing training courses but suddenly it may lose that employee due to lack of transparency from colleagues, team leaders, and the CEO as well. Imagine the time and the cost it takes to recruit new employees without being sure of whether the same problem may happen again or not"*.

At the organisation level, it has been noted that when there is a lack of transparency amongst employees, team leaders and management members, there is a high chance for <u>rumours</u>, <u>biased opinions</u>, <u>inaccurate information</u> and <u>fabricated reactions</u> that will control the entire organisation processes and particularly employees' communication. Common risks that concern some of the interviewed employees regarding lack of transparency were <u>nepotism</u> amongst employees and the <u>unjustifiable decisions</u> made based on the special relationships with decision-makers.

On a personal level, the researcher found that lack of social transparency has a role in increasing <u>work towards personal motives and personal agendas</u> that destroy team spirit and decrease productivity both in quality and quantity. Based on our definition of social transparency, lack of social transparency between team members or organisation members means no information about colleagues' intentions towards their work activities, their interests in certain kinds of activities, their availabilities for future collaboration or justifications for unexpected actions. The observed enterprise social software does not have features that show employee's intention to certain activities; therefore, employees tend to reveal it through conversation channels or in their profile as an area of interest. The researcher found from the interview that when the employee fails to know about other's intentions such as their priorities and interests in certain tasks, that may create a <u>conflict in performing these tasks and spend significant time in the least priority tasks</u>. The consequences of task conflict may appear as delays in the overall employee progress and relationships conflict between employees and low overall productivity. Relationships conflict refers to personalised disagreements that divert attention away from the task and diversely affect team performance (Guenter et al. 2016). Lack of social transparency can be considered as a reason for <u>relationship conflict</u> because employees are unaware of other members' diverging interests and incompatible preferences that make employees

misattributed the intentions of others. As a result, risks such as <u>tension</u>, <u>annoyance</u>, <u>low work satisfaction and commitment</u>, <u>lack of trust</u> and <u>low group cohesion</u> has a high chance to stem amongst employees.

We found in our previous studies that social transparency has a significant role in strengthen team coherence and eliminate most of <u>misconceptions</u> and <u>misinterpretation</u> that may happen due to the absence of certain information. Employees are active in obtaining their situation awareness by communicating with teammates, direct their attention and manipulate their tools to search for relevant information (Endsley 2015). Thus, the researcher found that the inability to obtain information about teammates can be seen as a common reason for making the wrong judgment and misconception. For example, in Slack and workplace by Facebook, no feature shows the location of the employee therefore, being unaware of the employee's current working location may make other colleagues question his/ her commitment to the assigned work. Other examples of risks that stem from a lack of transparency are <u>loss of interest</u> and <u>lack of collaboration</u>. For example, no transparency about interest in performing collaborative tasks may demotivate employees and make them think carefully before engaging in this task. Social transparency can be seen as a way of reinforcing employees by sharing information that motivates them. A participant described this in the following sentence: *"If I work in a collaborative task, I would like to know if my work partner is interested in the task or not. Knowing this motivates me to and make me eliminate any feeling of being overworked"*.

6.3.3.2   RISKS RELATED TO TRANSPARENCY SHARING PRACTICE

Research on social transparency describes it in a model where two parties exchange their information, and an observer has an opportunity to engage in these exchanges (Stuart et al. 2012). The researcher observed the communication style amongst employees based on voluntary basis of our definition of online social transparency and we noted two types of voluntary social transparency based on the communication styles: asymmetric and symmetric social transparency. Asymmetric social transparency occurs when one party is more transparent about his/her information than the other party which makes their perception and knowledge about each other is unequal. In this kind of transparency, one party is un/intentionally holding the information to be available to the other parties. Symmetric social transparency identified as the equal transparency behaviour where the two parties are transparent about their information and have enough perception about each other. The researcher noted various risks related to the way of communication between colleagues in the two companies. The following sections detail the potential risks of each communication style. Table 9 Summaries the risks associated with transparency sharing practice.

Symmetric Social Transparency	Asymmetric Social Transparency
Information overload	Insufficient knowledge
Distraction	Delay in progress
Big information history	Low performance and productivity
Time/effort consuming	Power imbalance
Conditional reciprocity	Stress
Pressure	Insecure employees
FoMO	Pressure
Uncomfortable place	Low group cohesion
Loss learning opportunity	Insecure workplace
Low harmony	Unfair workplace

- **Risks related to asymmetric online social transparency**

As described before that asymmetric online social transparency appears as a lack of equality of the transparency behaviour between two parties. This type occurs when one party is more transparent, in terms of information content and, also timing and proactiveness than other parties. Asymmetric transparency can make a discrepancy in situational awareness. As social transparency in this research is voluntary basis and employee self-decision, there are no regulations that oblige employees to be transparent with each other how to choose the time and frequency for doing so. It was noted that employee tends to lose trust with colleagues who hold some information and are not transparent about their intentions. A data engineer revealed his concern about asymmetric social transparency and stated that *"While transparency should be a two-way communication, some employee may withhold their information and use other's information to control them"*.

Asymmetric social transparency can create power imbalance as individuals may use others information as the power to control them or misuse their information for personal benefits such as

complaining against an employee to relocate him/her to a different department. From a collaboration perspective, there is a high chance to reduce the collaboration with employees who are not transparent or less transparent about their information compared with their colleagues. Employees may have stress and insecure feelings to collaborate or engage in work with an employee that is less transparent than them.

Asymmetric social transparency may also have a negative impact on the individual who is less transparent. Less transparent employees may face a problem of information overload due to the over sharing of social information from their colleagues. Participants stated that the problem of information overload where observed as over-sharing of files in the conversation channels in Slack. Other participants claim that the asymmetric transparency behaviour adds pressure to them to cope with the behaviour of more transparent colleagues. A participant declares that this pressure may happen for employees who tend to cope with others behaviour to create a good impression or to avoid any blame for less transparent behaviour.

From the perspective of organisation performance, online social transparency has been used to enhance collaboration, and the researcher found that asymmetric online social transparency may have a negative impact on the overall performance of the organisation. For example, risks such as insufficient information due to inequivalent communication between members of organisation and low consistency of transparency behaviour play a significant role in delaying the employee's progress, lowering their performance and reducing the overall productivity of the organisation.

- **Risks related to symmetric online social transparency**

As described before that symmetric online social transparency is when two parties have equal knowledge about each other. Symmetric social transparency has been applied in the workplace to allay the risks of lack of asymmetric social transparency. However, the researcher found that the quality of the information in symmetric social transparency was the main causes of various risks. By observing symmetric social transparency in slack and workplace by Facebook, it was noted that the quality issues such as the presentation, the time and the relevance of the information are the essential causes of risks in collaborative workplace.

The researcher noted in the observed enterprise social software that employees might be transparent but the information they shared is massive, which makes the recipients spend significant time looking for the relevant information before making a decision. Some participants describe that as a wasting of time and costs of effort on searching for the information that has to be relevant to their

activities. Rather than the time-consuming in searching for relevant information, this transparency may cause information overload to employees who are not interested in this information. A participant who uses Slack stated that they create specific channels to integrate with other services either related to work or not, such as channel for testing bugs, channel for employees who send us tweets or channel for social events in the company. It was explained that creating these channels was meant to avoid problems of overloading one channel with massive information. Another participant declared that Slack has a feature that shows the number of unread messages that include his name or were direct messages to him. He mentioned that this feature help information receivers to mitigate stress stems from missing unread messages that may not be related to them.

Conditional reciprocity is another interesting noted behaviour in symmetric social transparency. Employees would be socially transparent when their colleagues are transparent as well. The decision of the conditional reciprocity is based on the assumption that the other party will be transparent in the future. If the other party continually fails to be transparent, it will be reputational and other employees will stop being transparent with him/her. That would add pressure on employees to avoid losing transparency of others as well as avoid Fear of Missing Out (FoMO) feelings occurring when they expect a return to their transparency from colleagues. FoMO is described in (Przybylski et al. 2013) as "the desire to be continually connected with what others are doing.". Besides reciprocity in transparency behaviour, the researcher also found that symmetry in online social transparency also means symmetrical reciprocity in the quantity of the information that employees are transparent about. For example, employees might be transparent about their interest in certain tasks, their long-term goals or their work dependencies when their colleagues are also transparent about this information. Employees tend to be reciprocal in their transparency behaviour to avoid risks stems from asymmetric social transparency that discussed in the previous section. However, the researcher found that various risks may stem from the reciprocal transparency. A software engineer described this behaviour as *"a sign of loss of trust between employees, and that may happen when an employee has been exposed to risk by treacherously share his own information by another employee"*. It was noted that when people are losing trust with others and being symmetrical transparent with each other, their work will lack collaboration and employees may lose the opportunity to learn from each other and lose the opportunity to strengthen their work relationships. Participants in the two companies have the same opinions about having symmetrical transparency but without conditional reciprocal transparency.

6.3.4 CATEGORIES OF SOCIAL TRANSPARENCY RISKS

Our analysis of the studies grouped the risks of online social transparency based on their influence area into (i) performance, (ii) wellbeing, and (iii) workplace environment. Table 10 presents the main categories of risks revolving around the different levels of transparency and the transparency sharing practice.

6.3.4.1 RISKS ON PERFORMANCE

Enterprise social software (ESS) has been integrated into the workplace to enhance social relationships amongst employees and support their performance and productivity (Dürr et al. 2016). Based on (Chui et al. 2012; David et al. 2013), the use of social software in the workplace potentially improves workforces productivity due to reduced emailing, providing faster access to information and increased collaboration which supports the overall performance of organisations. Observing the social transparency between employees in the two enterprise social software shows that the level of transparency (discussed in section 6.3.3.1) and the sharing practice of transparency (discussed in section 6.3.3.2) have a chance to adversely affect the individual performance as well as the group performance (presented by a team or organisation). The following sections present the observed risks that may stems from social transparency in ESS.

- **<u>Individual performance</u>**

As discussed in Chapter 4 that online social transparency had been applied in the workplace environment to increase employees' awareness about their colleague's activities to increase motivation and collaboration as well as strengthen their relationships. Enterprise social software has been designed to share real-time and synchronised information. However, lack of regulations of social transparency in ESS makes employees share their information without taking into account its effect on their colleagues. For example, the excessive transparency about the activeness of specific tasks may create <u>stress</u> and may <u>pressure</u> collaborators to furnish required resources and synchronise tasks with others according to their timing. The <u>distraction</u> that may happen due to the transparency of irrelevant information may slow the progress of the employee. A participant declared that *"Checking every message in the team channel cost us a time to go back to work"*

In collaborative work, we believe that individual performance is based on the ability and motivation. An employee needs to have the ability to perform the task as well as the motivation. Enterprise social software has been used in the observed companies to share information to reduce obstacles that may affect individual performance such as resource availability. Lack of transparency

about resources deficiency such as time, personnel or supplies affect employees' ability to complete their task. In addition, late transparency of resources deficiency may add <u>pressure</u> to employees to adjust their performance to the available resources which may also affect the quality of their output. We found in our observation that employees tend to share their techniques of solving certain problems either to promote their abilities or to make others learn from them. However, this kind of voluntary transparency may <u>reduce the innovation and creativity</u> of other employees to find intelligent solutions. Some participants declared that public channels in Slack might have junior members (either in age or experience) who they can be easily affected by the attitude of senior members due to their limited experience in work. Therefore, transparency of personal techniques in the public channels which is accessible by all members may <u>reduce the performance</u> of junior members who may be able to improve his/her performance by using different techniques.

- **<u>Group performance</u>**

The benefits of using enterprise social software for a group of employees, presented as a team or organisation, include improved information sharing, enhanced work co-ordination, and better possibilities for employees to express their interests or concerns (Kügler and Smolnik 2013). Social transparency in ESS used to create a knowledge based interactive environment to motivate others to collaborate or to engage in certain tasks. Research on employee motivation revealed a positive relationship between transparency, intrinsic motivation and group performance (Hartmann and Slapničar 2012; Marlow and Dabbish 2014). Despite that, we noted that transparency of incomplete or incomprehensible information might <u>demotivate employees to collaborate</u>. For example, team members can share code snippets in Slack but sharing incomplete or incomprehensible information about the purpose of the code may not motivate colleagues to engage in the conversation about this code.

The researcher also noted that group productivity might be affected by social transparency between group members. An example of the observed company points out when employees are transparent about their interest in specific tasks, another member may be less motivated to work hard on behalf of the group. This loss of motivation may create <u>social loafing</u> or <u>free riding</u>. Social transparency might cause social loafing and free riding in the large group where more than one member works in the same task or goal.

As discussed in Chapter 5 that lack of transparency about task priority may cause a <u>conflict of tasks</u> amongst employees. Slack has no specific feature that shows the priority of the assigned tasks of each member, so employees tend to share their priorities in the conversation channels to coordinate

the work with other team members. However, lack of transparency about task priority within teamwork has a chance to <u>lower the progress</u> of the team. On the contrary, transparency about task interest and priority helps team leaders as well as team members to build a clear proactive vision of potential consequences or find alternatives solutions without affective the overall performance of the team. The researcher noted that group performance could be influenced by group cohesion and group mental model. It was stated that social transparency adopted in the workplace to push group members closer together and to enhance their coherence in order to increase the organisation overall productivity. We found that <u>low group cohesion</u> can stem from a lack of transparency about members identity (skills, background, age, value or ethnicity) and group size before engaging with group in certain work. A participant stated that social transparency before engaging in a task *"Makes employees join groups that share similar background or experience. This similarity makes it more likely that employees share similar views on various issues and similar communication styles"*.

Group mental models can be achieved by having similar thoughts and feelings about the group task and the way it should be performed. Various researches suggested that as mental model of the group become more socially shared, their influence in the group performance grows and group may function more effectively and efficiently because these shared mental models create a guidance that contributes to individual performance as well as help in coordinating group members effort (Willems 2016; Schmidtke and Cummings 2017). In the context of our research, we noted that some employees might tend to be excessively transparent about their activities aiming to raise awareness and construct shared mental understanding with other members in order to coordinate their behaviours. Although social transparency plays a significant role in building a shared mental model, unconscious social transparency may also make employees share negative thoughts or feelings that may create <u>emotional contagion</u> amongst team members.

6.3.4.2   RISKS ON WELLBEING

Companies adopted various networking techniques such as slack, workplace by Facebook, Yammer, and Skype for business in their communication culture to support the acceleration of decision-making process and also to enhance the relatedness needs for their employees. However, the first two studies in this research (i.e. interview and focus group) have shown various risks on individual wellbeing that stems from social transparency through these online platforms. Moreover, observing and interviewing employees who work in the same team reveal risks related to the group wellbeing. The following sections detail the risk which stems from being socially transparent with colleagues in the same team or the same workplace.

- **Individual wellbeing**

Employee wellbeing is one of the key issues that companies are striving to address to ensure that their employees remain satisfied and motivated at work (Renee Baptiste 2008). From our studies, it has been noted that social transparency could adversely influence individuals' wellbeing including their social wellbeing, emotional wellbeing and mental wellbeing.

From the perspective of social wellbeing, enterprise social software has been built to fulfil the need for belonging and to make employees feel closer. One of the teams in the observed company has collaborators from different companies. The team used slack to engage the distributed members in their daily activities and to make them feel part of the decision-making process. The researcher noted that lack of belonging is one of the common issues that resulted from a lack of transparency between peers in the same team. Some features in slack such as employee status, employee availability and do not disturb feature are designed specifically to support social communication amongst team members. Employees may also use conversation channels to share some information about their activities that may not be able to display them in some features such as their interest in certain tasks or updates in their current work. In these channels, employees are able to integrate information and tasks from different applications such as Jira and Asana without considering the interest, the experience, the skills and the background of all members in the team. Thus, improper presentation of social transparency has a chance to make employees who work remotely feel a sense of isolation and less valued and considered especially those who may not have experience in these different applications.

From the perspective of mental wellbeing, it was mentioned earlier in this chapter and in Chapter 5 various risks that may affect the employee mental wellbeing. Risks such as stress and pressure may stem from transparency about the information that conflict with other member's interest or goals. A participant stated that their colleagues tend to be transparent about their priority in the work that has to accomplish by sending Jira ticket, as seen in Figure 12, to the public channels, but this transparency may add stress on others who depend on the lowest priority task. As discussed in section 6.3.3.1 that the excessive level of transparency could increase the disturbance from the main task, the researcher noted that the real-time nature of online platforms such as slack increased the rate of disturbance more than in-person communication. Slack allows the users to be linked to their emails to make them able to bring the email into the conversation channel to share and discuss it with the team. This unmanaged sharing and disturbance may distract employees from focusing on their job. Uncertainty is another

risk that declared by our participant and they linked uncertainty with the lack or incomplete transparency about their peers' activities which make the former less aware of their peers' situations.
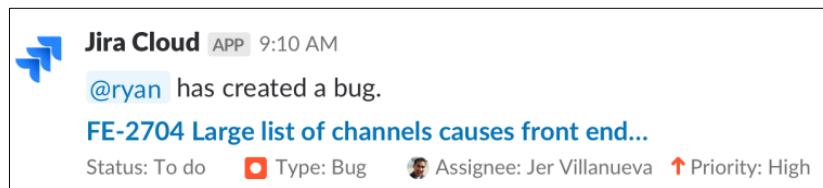
FIGURE 12: EXAMPLE OF TANSPARENCY ABOUT HIGH PRIORITY TASK

Emotional wellbeing is another aspect related to individual wellbeing in the workplace (Hawthorne et al. 2018). It has been noted that some employees might use slack to share information with colleagues about their work progress and work achievement. However, sharing this kind of information in the public channels may reach an employee who is less skilled or have less experience which consequently lowers their self-esteem. Moreover, it may also have a chance to leave bad impression about others' progress if the information reached joint high authority such as project manager. In a similar situation, employee may not be transparent about the dependency on the third party in their progress, may make the project manager to unfairly compare them with employees who may not have a dependency with the third party in their work.

- **Team wellbeing**

Social transparency has emerged in the team as a norm to make team members close to each other and support their friendships to create a harmonious collaborative environment as well as increased team production. Unmanaged social transparency may affect negatively on the team performance and wellbeing. The researcher noted that a team could suffer from distrust problem due to misusing the information that provided by team member. For example, employees may share what slows their progress in order to eliminate high expectations or to seek collaboration from other members. Unfriendly colleagues may use this information to report against that person to avoid blame on the progress of the whole team. It was stated by a participant that lack of trust may create a tense atmosphere in work between team members. The researcher found that there is a high possibility that employees would turnover from a team that lacks trust and has a tense atmosphere.

6.3.4.3   RISKS ON WORKPLACE ENVIRONMENT

Studies in transparency in the workplace revealed that social transparency through various online platforms such as email, employee profile and employee calendar facilitates communication amongst employees and makes the decision process quicker (Erickson and Kellogg 2000; Dabbish et al. 2012;

Huang and Fu 2013a). However, studies conducted in this research showed that unmanaged social transparency may have a negative impact on the workplace environment which discussed in chapter 5 and in previous sections in this chapter. Reviewing the potential risks that emerge from unmanaged transparency asserts that these risks are the reasons for creating unhealthy workplace environments. Based on our studies, we found that social transparency has a role in creating <u>favouritism</u> culture in the workplace. Favouritism is defined as special privileges or treatment provided to one person over all of the other employees (Arasli et al. 2019). It was mentioned in section 5.3.1 that some employees may use social transparency to promote their identity and relationships which may lead to favouritism from management or colleagues. Favouritism that emerged from social transparency has a correlation with feelings of <u>disengagement</u> from work, feeling <u>discouraged</u> by non-favoured employees.

Another risk that threatens the workplace environment is <u>employee clustering</u>. It was mentioned in Chapter 5 that social transparency has a role in creating an unwanted grouping of employees with the same interest, skills, experience or background. This could be negative as *"it will group all professional employees in one group and all beginners in another group"*. As stated by a participant that having symmetric groups in the workplace can be seen as one of the signs of <u>unfair workplace</u> that isolate certain employees from certain groups. The indirect effect of clustering that caused by social transparency is <u>decreasing the learning opportunity</u> of new or less-skilled employees which in turn affects their productivity.

An interesting observation is that the instant nature of online social transparency <u>spread employees' moods and feelings</u> to all their colleagues in the organisation. If some employees are upset and worried, transparency through online platforms about these feelings can easily be reached to most members of the organisation. Unlikely, face to face transparency or what is called offline transparency may have a slower impact on spreading the negative mood or feelings. Participants declare that transparency about feelings or mood has a significant impact on the enterprise productivity and long-term success. A participant stated that *"What is shared in Slack may spill over into other employees, teams and departments. Once some information spread over the department, it is difficult to control it"*.

	Performance	Wellbeing	Workplace Environment
Normal Transparency	Loss of interest low engagement Low innovation Social loafing Free riding Employee Overstretching	Stress & Pressure Low self-esteem Negative impression Distrust	Favouritism Disengagement Discouraged employees Clustering Unproductive Competition
Excessive Transparency	Employee Isolation Lack of collaboration Information overload Slow Decision Making Loss motivation Loss of interest Increase mistakes	Inadequate and unprepared Confusion in intentions Stress Pressure	Uncomfortable Place Loss of concentration Loss of professionalism Employees Turnover
Lack of Transparency	Conflict of interest Loss of interest Lack of collaboration Tasks Conflicts Misconception	Lack of belonging Relationship Conflict Annoyance Lack of trust	Rumours spread Biased opinions Fabricated reactions Information inaccuracy Employees turnover Low group cohesion
Symmetric Transparency	Information overload Distraction Big information history Time/effort consuming	Conditional reciprocity Pressure FoMO	Uncomfortable place Loss learning opportunity Low harmony

	Insufficient knowledge	Power imbalance	Low group cohesion
Asymmetric Transparency	Delay in progress	Stress	Insecure workplace
	Low performance and productivity	Insecure employees	Unfair workplace
		Pressure	

6.4 THREATS TO VALIDITY

The observation study in this chapter has the following threats to validity:

- The common threat of observation study is the possibility of reactivity. Subjects who observed might not behave in the way that they normally behave. It was noted that some. This issue addressed by conducted a semi-structured interview with the participants.
- Another important threat to validity is the observer bias or lack of understanding of social context. To reduce such limitations, the researcher conducted a follow-up interview and focus group to reflect on the results and confirm the final outcomes.

6.5 CHAPTER SUMMARY

This chapter discussed the results of the third empirical study in this thesis. This study adopted the observation, interview and focus group methods to achieve the research objectives. The main contribution of this study was the exploration of the peculiarities of online social transparency and the risks of social transparency from different dimensions; (i) the level of transparency and (ii) the sharing practice. The finding in this chapter contributed to grouping the risks based on their influence area into (i) performance, (ii) wellbeing and (iii) workplace environment. In the next chapter, the findings of all studies will be used to design an assessment method for online social transparency.

7. ASSESSMENT METHOD FOR ONLINE SOCIAL TRANSPARENCY

In this chapter, we present the method designed to identify and assess the risks of online social transparency in enterprise. This chapter covers the steps to apply the method and the materials needed for assessing process.

7.1 THE GOAL OF THE METHOD

This research aims to produce a comprehensive method that assesses online social transparency in the organisational software and detect its negative consequences. As viewed in Chapter 2, literature in assessing social transparency has a limitation in various sides of the assessment method as presented in the following:

1) Transparency has been categorised as a quality requirement, and the assessment process examines transparency in relation to various quality requirements as in (Cysneiros 2013).
2) The assessment methods have not assessed the side effects of transparency.
3) The existing assessment methods are led by system analysts and managers and have not engaged the real users in the process.

Existing methods that design, engineer, and assess transparency in organisational software create a remarkable effect on the implementation of transparency. Section 2.6 discussed the approaches proposed to manage social transparency. Although these works illuminate the potential promise of managing social transparency as an information quality issue, in our work, we address the question of how to manage social transparency as an autonomous decision and behaviour. Therefore, the proposed method specifically designed to engage real users to identify and assess the risk of social transparency that practiced through various enterprise online platforms. This method will gather the risk information from the actual affected users in the enterprise and serve this information as input data to the analysis process, as discussed later in this Chapter.

7.2 THEORETICAL FOUNDATION OF THE ASSESSMENT METHOD

As previously represented in section 2.6 that the existing approach assess transparency as a quality requirement for enterprise information systems (Cysneiros 2013; Hosseini et al. 2016b, 2018a). In this research, transparency has been dealt with as social behaviour adopted autonomously by enterprise members to build knowledge about peers and their activities. Enterprises are increasingly recognising the benefits of integrating social computing and networking services into their operations

and architecture to support productivity (Dabbish et al. 2012). Furthermore, there is a drive to provide various quality dimensions in their applications such as security, privacy and transparency to maintain internal and external relationships.

As discussed in this research, social transparency in enterprise applications enables team members to gather information, learn from each other, detect real-time events, increase collaboration amongst each other, and enhance decision-making processes. The ultimate goal is to enable the enterprise to reach its strategic goals more rapidly and at the same time, maintain quality and social requirements such as job satisfaction and perception of openness and fairness. The findings from this research suggest that introducing social transparency services into enterprise information systems can also introduce risks that can stem from the unguided and completely open style of sharing information within the workspace. Work on enterprise social computing is mainly motivated by learning and information sharing (Lee and Lee 2018). However, the facilities provided for information sharing are not sensitive to the content and interaction time and audiences. This means the risk identification, assessment and mitigation are left for the social actors within the system and not assisted via automated tool.

The studies in this work suggest that users of enterprise applications might require more intelligent online social transparency services design, which is personalised and design with risk detection and mitigation as the main requirement. The analysis of these studies demonstrated the need for a method to assess social transparency and avoid potential risks when applying it in enterprise applications. Unlike technical enterprise issues that are assessed by metrics, social transparency voluntarily is a subjective issue, and it is often judgment based.

The researcher found that social transparency in enterprise applications has a dynamic nature and gives it side effects on the day-to-day life of the organisational members. The intentions of enterprise members may change over time. Therefore, we found that decisions about transparency risks and assessments can differ from one actor to another and in the same actor from time to time.

Moreover, assessing transparency to mitigate certain risks has a potentiality to cause a domino effect where assessing transparency about one risk might introduce another undesired side effect. For example, enterprises assess transparency to tackle risks caused by a lack of transparency amongst their actors such as *conflict of goal and task*, *loss of interest* and *lack of collaboration*. However, the provision of information to avoid the problem of lack of transparency may introduce other risks such as *information overload*, *social loafing* and *conflict of interest*. Based on our findings, we advocate

that the assessment method has to meet various requirements. Here is a list of the initial requirements of such a method:

- **Self-reporting techniques**

Unlike online technical issues, the consequences of online social transparency are unremarkable in the workplace environment. Therefore, self-reporting techniques such as questionnaires, interviews, or diaries enable enterprise actors to provide information about their thoughts, feelings, behaviours or experiences of social transparency. Smyth and Terry (2007) stated that self-report techniques are used to gather personal subjective information that is difficult to be obtained objectively. They also declare that in settings, such as policy making and opinion polls, essential decisions rely on an individual's subjective evaluation and report of their thoughts and feelings.

- **Participatory approach**

The participatory approach in research has three core principles: Empowerment, collaboration, and integration (MacKeith 2011). Regarding the empowerment principle, they stated that solutions to social problems rely on the harnessing of the participants and their abilities to experience the problem. From our studies, we found that social transparency is one of the social phenomena in enterprise that is associated with a remarkable self-presentation concern from employee's sides. For collaboration and reducing the concerns of self-presentation, the researcher suggested to design a method that involves enterprise actors collaboratively in the assessment process. This involvement has a high chance of increasing their feelings of ownership and sense of responsibility. Engaging enterprise actors in the decision-making process play a role in their acceptance and using the assessment method and provide their thoughts and feelings regarding the practice of online social transparency. Based on (MacKeith 2011), the participatory approach has a dual aim of addressing practical problems and advancing knowledge where action and research are integrated into one single process.

- **Longitudinal approach**

As mentioned earlier in this section that social transparency has a dynamic nature and gives its side effects over time. It was also illustrated that social transparency side-effect becomes evident once it is practised in the day to day life of the enterprise members. Hence, the researcher suggest using a longitudinal approach in collecting the data and the analysis process. Holland et al. (2006) point out that longitudinal approach tends to vary across research disciplines, including, for example, continues studies in the same community over time, follow-up studies of previous research, repeated interviews

with the same participants at regular intervals, and life-course research involving data collection across several generations. The following describes the designs involved in the assessment method.

1. **<u>Data collection over time:</u>** The assessment process requires to be run over a period of time using techniques like observation and diary studies. The reason is that some issues may emerge over time and some personal and social contexts can be relevant but hard to capture in a non-naturalistic setting.

2. **<u>Repeated analysis process:</u>** Due to the volatile and rapid nature of transparency risks, the assessment process has to be a lifelong process within the enterprises to keep the knowledge base up to date. A reporting system could be envisaged, and solutions around crowdsourcing and social sensing can be employed.

- **Detective Approach**

  Enterprises that decide to reduce the risks in their work environment need to identify control activities that can effectively reduce the risks or the cost associated with them (Ballou and Heitger 2005). A control activity consists of activities that reduce the probability and frequency of any risk. Control activities fall into three categories;

  ➢ Preventive control is designed to be implemented prior to a risk event to avoid the impact of this event.

  ➢ Detective control is designed to detect risk while it is occurring and provide assistance during investigations and audits after the event has occurred.

  ➢ Corrective control is designed to mitigate and limit the impact of the identified risks.

The proposed assessment method in this thesis is designed to be a detective method to identify the unremarkable risks and risk factors of online social transparency. Moreover, it involves a designated tool and risk analysis techniques to enable the decision-makers to investigate and make an informed decision for planning a reduction or prevention solution.

7.3   ASSUMPTIONS

One of the important tasks to help in understanding and effectively using the proposed assessment method is to decide what assumptions the users are likely to have. Our assessment method was designed with regards to the following assumptions:

- The assessment method is made to be implemented in large enterprises. In small and medium enterprises, there are limited resources and small-sized projects. Therefore, implementing such a method will cost more than it benefits. The assessment of social transparency can be implemented by simple and low-cost methods such as interview employees.

- The assessment method targets the enterprises that have online platforms for communication such as e-mail, social media accounts, collaborative software or enterprise social software. Social transparency through online platforms may not reflect the real intentions of the information providers which leave a room for unreal thoughts and explanation by information recipient. This lack of reasoning and intentions transparency in online platform is the source of the occurrence of the risks.

- The users of the assessment method have reasonable knowledge about risk analysis and risk management. The assessment method was designed to make decisions based on a discussion between employees, system analysts and managers. Discussion with systems analysts with no experience in risk analysis would not provide valuable results.

- The users of the assessment method have knowledge about enterprise modelling and goal model. Social transparency in this thesis is about revealing intention and reasoning behind personal actions such as status, goals, plans, tasks, interests and social interdependencies. Therefore, the proposed method designed to assess the risk of social transparency based on its impact on organisational social actors. Personal intentions are all common constructs in Goal-Oriented Requirement Engineering (GORE) (Yu and Mylopoulos 1998).

- Enterprise management is aware of the concept of social transparency and its negative consequences on individual productivity and enterprise performance.

- Enterprise staff are willing to participate in the assessment process. The proposed method gathers risk information based on the voluntary participation of the enterprise members. Unwilling to provide information may affect the effectiveness of the proposed method. We assume that employees are willing to participate in the assessment process and provide the related information. As future work, we suggested integrating gamification elements to the method in order to motivate employees to participate in the assessment process.

The researcher argued in (Alsaedi et al. 2019b) that enterprise also needs to integrate assessment process for social transparency which allows better management of the content of transparency, interaction time and the set of audience, still without contradicting with the free-spirit in social transparency and its voluntary nature and reliance on an openness culture. The assessment method aims to assist systems analysts and enterprise management in planning for risk management strategy. This method helps them to identify potential risks that occur as a result of social transparency through online platforms. Moreover, this method supported by an automated analysis tool that accelerates the analysis process for system analysts and reduces the time-consuming in planning risk management strategy. To achieve this method, several qualitative studies were conducted, including focus groups, interviews, and observational study. The researcher suggests that such an assessment method has to include two phases: the preparation phase and the action phase, presented in Table 11. The following sections describe the activities of each phase.

Stage	Activity	Description of the activity steps	Used materials	Outcomes

1. Preparation	1.1 Induction session	• System analysts and management will conduct induction sessions to inform enterprise staff about
		  ➢ The meaning of social transparency
		  ➢ The potential consequences that may stem from unmanaged behaviour of social transparency
		  ➢ Rationale for analysing social transparency and the need for risk analysis method
			Documents include:
			➢ Definition of online social transparency
			➢ Educational brochure
			➢ Scenarios, which describe the concept of social transparency and context that may cause risks in individual and organisational level.
				➢ Enterprise staff who are aware of the reason of the assessment process and ready to participate in the observation activity

	1.2 Team creation	• Enterprise management advertise for the need for volunteers for the assessment process • Creating an assessment team that includes representatives of roles in the enterprise, managers and systems analysts. • Training the assessment team on risk analysis tool and the observation sheet Assessment team will be provided with a list of risks and risk factors in regard to online social transparency	➢ List of risks and risk factors ➢ Risk Analysis tool ➢ Goal based risk analysis techniques ➢ Observation sheet template	➢ Assessment team who are aware about the reason for the assessment process and trained to contribute in this process
	1.3 Training session	Each member from the assessment team will train a group of staff on using the observation sheet	➢ Observation sheet template ➢ List of risks and risk factors	Trained enterprise staff on the using of the observation sheet
	1.4 Setting the analysis process	• System Analysts need to build goal model that represent the work boundaries of each role and the strategic dependencies between them • Assessment team, Systems analysts and management will collectively identify the following ground rules:		➢ Goal model of enterprise information system ➢ A Policy document of ground rules

		- The number of completed observations per individual e.g., at least two completed observation forms by person - The round of assessment process, e.g., monthly, quarterly, annually.		
	2.1 Individual activity	Staff volunteer in reporting observations by completing the observation sheet	➢ Observation sheet ➢ Definitions of the content of the observation sheet ➢ List of risk and risk factors	➢ A number of sheets that report the observed transparency behaviour and staff concerns ➢ Raw observations data
2. Action	2.2 Assessment team activities	- Reviewing all feedback from staff - Use Risk analysis tool to ➢ Extract remarkable risks and their factors ➢ Track the number of observations per week or month ➢ Track the percentage of staff participations ➢ Track the rate of communication amongst staff ➢ Rank risk severity ➢ Extract affected stakeholders - Conducting discussion sessions with system analysts and management to build several analysis charts by using the **analysis tool** and **goal model** to identify the areas where more attention is needed to minimise its related risks.	➢ Goal Model ➢ Risk Analysis tool ➢ Goal based risk ranking technique ➢ Goal based risk stakeholder technique	➢ Useful information extracted by analysing the raw observation data by using the risk analysis tool ➢ A number of risk analysis visualisations built by using the risk analysis tool ➢ Risk ranking matrix ➢ Risk stakeholders' diagram

7.4.1 THE PREPARATION PHASE

This phase is expected to be administered by the system analysts alongside enterprise management. This phase aims to (i) inform enterprise members about the rationale of the assessment process, (ii) determine the parties involved in the assessment process, and (iii) set up the scene and the analysis process. This phase involves the following four steps:

7.4.1.1 ACTIVITY 1: INDUCTION SESSIONS TO ENTERPRISE STAFF

As mentioned earlier in this thesis that the risks of online social transparency are unremarkable in the enterprise environment. Therefore, enterprise staff need induction sessions in order to introduce the need and purpose for assessing social transparency behaviour in the online platforms. The enterprise management and system analysts conduct this step. The induction session is used to (i) introducing enterprise staff with the meaning of social transparency, (ii) the potential consequences that may stem from the unmanaged behaviour of social transparency such as information overload, stress and loss of interest and (iii) the reasons that make the management to start analysing social transparency such as a remarkable delay in the production of certain tasks due to lack of collaboration or social loafing. Social transparency is a social phenomenon in the enterprise and the success of its assessment process is based on the voluntary engagement of employees. The importance of induction session comes from the following benefits:

- Engaging staff in the decision-making process to increase their voluntary participation in the assessment process. Several studies in work motivation found that involving employees in the decision-making of their enterprise improvement increases their intrinsic motivation and voluntary engagement in the improvement process (Ryan and Deci 2000; Millette and Gagné 2008).

- Staff feel they are valued contributors to enterprise success. Eengaging employees in the decision-making process make them feel valued from members in ownership and management positions (Chandani et al. 2016). When staff feel valued, they will increase their level of effort and commitment to ensure the enterprise's success.

- Staff feel a stronger commitment to responsibility for enterprise success. By illustrating the power of staff engagement in the success of the assessment process, the chance for efficiently executing the assessment process increase since all staff are committed to the decisions that align with the enterprise values and vision. Self-determination theory is a human motivation theory

that linked employees empowerment and their autonomous/intrinsic motivation and commitment in an activity (Fernandez and Moldogaziev 2015; Deci et al. 2017).

Educational materials can support the induction sessions by applying one or more of the following materials:

- **Textual educational materials:** System analysts and enterprise management can prepare educational documents by collecting some information from research findings and organise them in attractive and user-friendly documents to ensure the delivery of the information. Figure 13 presents the brochures about online social transparency extracted from the findings of this thesis.

ONLINE SOCIAL TRANSPARENCY

Educational brochure

1. WHAT IS ONLINE SOCIAL TRANSPARENCY

Enterprises integrate social networking within their information systems to enhance coordination and collaboration amongst their members. Social transparency within an organisation refers to the intentional sharing by individuals of information relating to themselves and their group to others in the workplace. This includes announcing personal achievements, task priorities, workload, social interdependencies, current activities, level of skills and level of interest in certain tasks and objectives.

2. WHERE IT CAN BE SEEN?

Social networking features can be seen in enterprise systems such as the online profile, calendar, dashboard, auto-reply and status. Social transparency is practiced in various online platforms that designed for communication and collaboration purposes. Examples of online platforms are Email, Collaboration software such as Slack, Yammer, social media for work such as Facebook.

3. WHAT IS IT USED FOR?

Social Transparency is often seen as one of the organisational regulations to enhance organisation-stakeholder relationships. It has often been researched from social viewpoints as a solution to:

- Maintain organisational ethics and reduce misdeeds
- Building or rebuilding organisational trust
- Staff engagement and motivation
- Enhance situational awareness
- Support coordination and collaboration amongst staff

4. CAN ONLINE SOCIAL TRANSPARENCY BE UNDESIRED?

The incomplete or unmanaged practice of social transparency in organisational information systems has potential side-effects. For example, a high level of real-time transparency between team members can lead to risks of stress, pressure and information overload. The negative impact of transparency in organisational information systems mainly stems from its usage as a performance tracking mechanism as well as a pressure mechanism to increase work quality and productivity. Transparency can be used to assess and motivate individuals through self- and peer- comparison based on monitoring their status, activities and performance. Pressure stems from a feeling of being watched and monitored by others in the workplace. Interest to collaboration in certain tasks or objectives may be reduced due to transparency about less priority of these tasks.

FIGURE 13: EDUCATIONAL BROCHURE OF ONLINE SOCIAL TRANSPARENCY

- **Scenario generation:**

Scenarios have shown a useful role in problem-based learning and situated learning since they present a natural situation where the acquired knowledge is going to be used (Erol et al. 2016). For immerse staff in the context of the problem, enterprise management with the help of system analysts can generate scenarios from the work environment to provide examples of situations where risks might occur and identify their factors. Scenarios can be supported by an exemplar of enterprise modelling such as goal model (explained later in section 7.4.1.3) to illustrate the loci of risks and their effect on the enterprise system.

Examples of generated scenario

A software development company has a mission to develop a security system for a university. A team of developers and system engineers were assigned to complete this mission. The team includes team leaders, developers, system analysts, and system testers. Each member of the team has specific goals and tasks to be completed at a certain time.

For this reason, they suggested using one of the collaborative software tools to track their performance and to provide help if needed by someone in the team. The software has basic features that allow members to share their status, work progress and public conversation with all members. The team has not been informed what they should\ shouldn't share in these features.

Scenario 1:

Mark (Developer) usually uses the status feature to describe his current work or to inform his colleagues if he is busy. One of the posts on his status was "coding is tough". The post was visible to all team members. The status showed others that he is currently working on the code of the software. His team knows that he is capable of doing the task, but they think that he currently does not want any interruptions. The team leader was expecting Mark to finish the coding by the end of the week because the project should be delivered within three weeks. However, when he saw Mark's status, he thought that Mark was not capable of finishing the task on time and then he ask Marks if he needs a help from someone more competent which makes Mark feel bad that he looks less skilled in front of the project leader.

Scenario 2:

A team leader offers extra credit for each member in the development team who finishes his work with fewer defects. He did that to encourage the members to work better and to avoid the appearance

of defects in the production phase, which will be a significant loss for the whole company, and they may lose customers trust. Simon is a developer who finished his coding part and sent it to the testing team to check for any defects.

The collaborative software that they use to track team progress does not present precisely the work progress of each individual. Simon knows who is working on his code, but he does not receive any information about the testing process which made him feel stressed. His concerns come from reporting any critical defects by the testing team. Then he will lose the opportunity to gain the extra credit offered by the team leader. Emma is the tester who works on Simon's code. She was working on Simon's code and other test cases that need to be finished in two days. She paid more attention to the test cases that need to be reported soon. So, she just showed in her progress bar that she just started the testing on Simon's code. However, the progress bar has not changed for three days which made Simon feel more stressed.

7.4.1.2   ACTIVITY 2: CREATION OF THE ASSESSMENT TEAM

This stage aims to create a multi-faceted team that is capable of assessing social transparency in the enterprise and identify where the enterprise systems are vulnerable and also providing valuable context about those vulnerabilities and various types of risks and risk factors. Creating the assessment team and preparing them includes the following two activities:

- **Step 1: Recruiting the team**

After raising awareness within the enterprise about the context of social transparency problem and the enterprise's strategic goal of assessing social transparency. The induction session is essential in accomplishing this step since the assessment team will be created based on volunteering to take part in the assessment method.

The first step is defining the responsibilities of the team itself and the expected level of reporting and recommendations from the team. For example, decide whether the assessment team will need to perform the assessment method only, or it should be responsible for tracking the enterprise progress towards the proposed recommendation resulted from the assessment process. This step is important to create an informed knowledge that allows enterprise members to make an informed decision to take part in the assessment team. After the responsibilities of the assessment team have been defined, attention can be turned to assemble the assessment team members.

The second step is advertising for volunteering to participate in the assessment method. The assessment team is comprising of representatives of roles in the enterprise, system analysts, and

members from the enterprise management. The voluntary recruitment involves the employees and not in the level of system analysts and managers. The reasons for involving enterprise members in the assessment method because social transparency is related to the culture of behaving in the enterprise. Therefore, involving them in the assessment process has an effective role since (i) they know more about the enterprise culture which consequently maximise their abilities in identifying the vulnerable practice of social transparency and its related risks, (ii) saving the time that may spend in training an external team on the enterprise culture, policies, and structure, (iii) it is considered as encouragement and motivation techniques through engaging them in the decision-making process and (iv) easiness of accessibility since the management can reach the assessment members when it is needed and the assessment team can reach the enterprise staff, teams and departments.

- **Step 2: Training the team**

After recruiting and assembling the members of the assessment team, a training course will be conducted to prepare the team for the assessment process and develop their ability in using the analysis materials. Training the assessment team has two purposes:

a) Prepare the team themselves to contribute effectively in the assessment process and in how to use the supporting materials (observation sheet and risk analysis tool)
b) Prepare the team to educate all enterprise staff, as explained in the next step.

The training course will include a description of the following materials that will be used to support the assessment method:

1. **A list of risks and risk factors**

This research explored various factors that considered as main sources of risks that stem from the unmanaged practice of social transparency. Risks and risk factors summarised in Table 12 and Table 13 were discussed previously in sections 5.3 and 6.3.

TABLE 12: LIST OF RISK FACTORS

Risk Factors
Actor-related risk factors
1. Actor Performance
2. Actor Demographics
Goal/Task-related risk factors
1. Goal/ Task Status
2. Goal/Task Priority
3. Goal/Task Duration
4. Goal/Task dependency
5. Goal/Task Interest
6. Goal/Task Progress
Resources-related risk factors
1. Resources availability
2. Ownership
3. Accessibility
4. Status
5. Sufficiency
6. Outsourcing
7. Value
Communication-related risks factors
1. Relevance
2. Presentation
3. Timeliness
Level of transparency-related risk factors
1. Lack of transparency
2. Normal transparency
3. Excessive transparency
Sharing practice related-risk factors
1. Symmetric Transparency
2. Asymmetric transparency

Risks Categorisations		
Risks on Performance	**Risks on Wellbeing**	**Risks on Workplace Environment**
Unproductive comparison	Tension	Employee clustering
Counterproductive competition	Low self esteem	workplace Unfairness
Undesired disturbance	Pressure	Employees' turnover
Conflict of goals /Tasks	Malevolence	Lack of collaboration
Loss of interest	Stress	Lack of engagement
Lack of commitment	Misunderstanding	Employee displacement
Social loafing	Disappointment	Delegation responsibility
Resource conflict	Misjudgement	Information overload
Delay in progress	Privacy violation	Conflict of interest
Distraction	Intimidation	Relationship conflict
Slowing performance	Abuse	Rumours spread
Low innovation	Mistrust	Biased opinions
Loss of concentration	Extortion	Fabricated reaction
Time/ effort consuming	Reduce motivation /	Information inaccuracy
Insufficient knowledge	Demotivating	Favouritism
Low productivity	Loss of belonging	Slow Decision Making
	Annoyance	Uncomfortable place
	Negative impression	Lack of professionalism
	Discouraged employees	Big information history
	Employee Isolation	Loss opportunity of learning
	Feelings of Inadequate	Low harmony
	Feelings of Unprepared	Low group cohesion
	Conditional reciprocity	Insecure place
	FoMO	
	Power imbalance	
	Insecure feelings	

2. Observation Sheet

An observation sheet was designed to collect the data from enterprise staff. Early in this thesis, social transparency was defined as a voluntary act to share information about the own individual information and it was discussed in section 7.2 that the decision about social transparency risks is subjective and differs from one individual to another and even for the same individual depending on their context. Therefore, and given the nature of the information and the individual differences in risk assessment, the researcher designed an observation sheet as human-centred techniques that allow capturing such diversity. In (Alsaedi et al. 2019b), we demonstrated that social transparency side effects become evident once it is practised in the day to day life of the enterprise members. Hence, the researcher suggested gathering observation over some time and merging it with the analysis method. Findings discussed in section 5.3 and 6.3 were used to design the observation sheet presented in Table 14 to fit the peculiarities and special nature of social transparency risks and the risk factors. The observation sheet is supported by a vocabulary definition, presented in Appendix 11.5.7, that describes the terms in the sheet and helps the staff in providing the required information.

Social Transparency –Observation Sheet

Date:

Note: - The observer number <u>is required</u>.   - Information related to observer's and observee's identity <u>is optional</u>

Observer Information	Observee Information
Number: Role:	Role:
Department: Team:	Department: Team:

Instructions:

1) This sheet should represent the observation for one case.
2) Describe the information observed and identify whether it is shared or missed in the online platform
3) Record (√) in the column **Yes** if the action is observed; **No** if the action is not observed
4) If **A1** is **Yes** then all the sentences need to be checked. if it is **No**, then jump to sections **B**, **D** and **E**
5) If one of **B1, B2** and **B3** is **Yes**, then the others are **No**
6) Describe your concern and the reasons in the **Comments** section
7) Activity refers to the functionality you perform to meet organisational goals such as **tasks** you perform or **goals** you work to accomplish
8) Record (√) in the column **DAO** if you **D**iscussed the **A**ction with the **O**bservee.
9) Determine in **CL** your **C**oncern **L**evel (**L:** low - **M:** medium - **H:** high)

Briefly describe the action observed

……………………………..…………………………………………………………………………………………

Impact on (wellbeing- performance- workplace environment)

What is the impact/concern of observee's transparency behaviour? …………………………………………………

Information Type: □Technical   □ Social   □Role-based   □ Goal/Task-based   □Resource-based

Online Platform: ………………………………………………………………………………………….

Online Platform Feature: ………………………………………………………………………………..

	Yes/No	Comments	DAO	CL
A. Content of Transparency				
1. The information was revealed		In a form of (text - picture – audio – video - special text e.g., programming code) Information was about:		
2. The information was relevant		Relevant to: How is it relevant?		
3. The information was accessible		Accessible issue: Elaborate more:		
B. Time of Transparency				
1. The information was provided before activity/Goal		Activity (task/goal):		

		Information was (instant – frequent-up to date): Elaborate more:		
2. The information was provided during activity/Goal		Activity (task/goal): Information was (instant – frequent – up to date): Elaborate more:		
3. The information was provided after activity/Goal		Activity (task/goal): Information was (instant – frequent – up to date): Elaborate more:		
C. Presentation of Transparency				
1. The information was sufficient		☐ In quantity ☐ In details: ☐ In quality: Elaborate more:		
2. The information was readable/browsable		In terms of (language – written content – resolution – others): Elaborate more:		
3. The information was easy to understand		In terms of (language – written content – drawing content – others): Elaborate more:		
4. The information was matched recipient's requirements		Requirements Description: Elaborate more:		
D. Observer and Observee Relationship				
1. Dependency to achieve goal /task		Dependency Description: Elaborate more:		
2. Collaboration in certain goal/ task		Collaboration as (team – individual volunteering) Elaborate more:		
3. Located in the same workplace		Elaborate more:		
E. Transparency Sharing Practice				
1. Equal transparency		Elaborate more:		

What suggestions do you have for minimising concerns about observed transparency?

……

……

Action needed? ☐ Yes   ☐ No

What was done? ……………………………………………..................... **Issue resolved?** ☐ Yes   ☐ No

3. Risk Analysis Tool

We designed a prototype of risk analysis tool to support the assessment method of social transparency. Figure 14 shows a snippet of the tool. The prototype is built by using Microsoft Excel to provide a more visual way of checking the tool design and a method to demonstrate the proposed tool to real users. The prototype helps of checking if the proposed design of the tool meets the requirements of the users who will be working with this tool. Microsoft Excel was chosen to build the prototype for the following features:

- Flexibility: It is easy to add sheets and VBA code, which help in quickly design user interface and business logic elements.

- Familiar tool: Most software developers are familiar with the functionalities of Excel and can use it in building a prototype with less costs.

- Ease of use: Using VBA and pivot tables in Excel rather than other languages avoids the need to worry about memory management and other programming tasks while developing the prototype. These features in excel save a significant amount of time if the prototype needs to be redone several times before finding the right design of the tool.

- Data friendly: Excel provides import/ export mechanisms. The data from the observation sheet are collected from several departments in the organisation by representative for the assessment team. This helps in storing the observations data for each department in separate files and import them all in one Excel file to be analysed by the assessment team.

- Visibility: Excel provides various visualisation of the data which makes it easy for the developer to create and embed charts, graphs, pictures and other visualisations that help in supporting the analysis and decision-making process.

- Availability: Excel is a software that is almost available in all organisations. It is one of the essential software in the organisation work. Availability of the excel facilitates the testing of the tool in a real organisational context with no need to afford the cost of installing new software.

This tool represents an example of business intelligence techniques that used as decision support systems. The researcher proposed this tool to improve the timeliness and the quality of the input of the decision process. This tool was designed as an interactive dashboard that analyse, monitor and visually display the important assessment results and allow the assessment team to interact with the data and enable them to take well-informed and data-driven decisions. The use of this tool will be described later in section 7.4.2.2. In general, this tool was designed to provide the following key benefits:

- Provide an interactive dashboard that allows the assessment team to run queries against the data and helps in using analysis techniques to create various reports.

- Interactive analysis empowers the assessment team to answer critical questions on-demand with up-to-date data. In addition, data can be viewed from different perspectives with a few clicks.

- Viewing the data most holistically by detailing time intervals, filtering and show and hide specific data that is not needed.

- Provide general calculations extracted from the collected data that give the assessment team insights about assessment progress.

- Provide several visual presentations of the data to make the analytical results available to the decision-makers.

- Summarises the main risks, risk factors, and related information such as staff quotes regarding certain risk, critical area where need more attentions and staff who affected by certain risks.

FIGURE 14: SCREENSHOT OF DASHBOARD IN RISK ANALYSIS TOOL

7.4.1.3   ACTIVITY 3: TRAINING ALL ENTERPRISE STAFF

Each member of the assessment team will play the role of a trainer to train a group of staff on how to use the observation sheet and the rationale for using observation to assess social transparency. The trainer will use the observation sheet template, the vocabulary definitions of the sheet and list of risk and risk factors to illustrate how observation should be provided. It is important in this step to clarify for the staff what kind of information should be considered as social transparency.

7.4.1.4   ACTIVITY 4: SETTING THE ANALYSIS PROCESS

This step presents the baseline for the assessment method. It is aimed to prepare the requirements for the analysis process in the next phase. This step consists of the two following activities.

1.   Building the enterprise model

Enterprise modelling is the process of building models of the whole or part of the enterprise information systems by using several model representations. It is based on knowledge about the enterprise, its actors, functions, and operations. Due to the complexity and dynamic nature of the enterprise architecture, several enterprise modelling approach has been introduced in the academia and industry (Vallespir and Ducq 2018). Most of the enterprise modelling approaches focus on what and why the enterprise should do in terms of informational, behavioural, and structural models of the different enterprise architecture layers (business, application, and infrastructure). Goal modelling one of the well-known approaches that represent the why behind the enterprise architecture in terms of rationales, goals, and requirements (Quartel et al. 2009). A goal has been defined to represent " a condition or state of affairs in the world that the stakeholders would like to achieve" (Yu 2001). Goal modelling represents concepts in enterprise socio-technical systems such as notions for actors, goals, soft-goals, and interdependencies between them (van Lamsweerde 2004b).

Social transparency is a behaviour that occurs amongst staff to express their thoughts, feelings, and commitments towards their works including their goals, tasks, and resources. Section 5.3 and 6.3 present several factors that play a role in introducing risks related to social transparency practice. The analysis of the risk factors was based on the presentation of the enterprise goal model. As a result, the assessment method of social transparency will be utilising the goal modelling approach as a baseline to provide a clear visual presentation of the enterprise social system and its activities. In this step, the assessment team alongside system analysts will build the goal model of the assessment environment, including the actors, their goals, tasks, soft-goals and interdependencies between them. This step is required in order to effectively implement the risk analysis process, which will be

explained later in this chapter. Several notations used to build goal models in system development, including *i** (Yu 2009), KAOS (Van Lamsweerde and Letier 2002), GSN (Kelly and Weaver 2004) and GRL (Feodoroff 2016). This thesis positioned in the area of knowledge that concern about the impacts that computing technology was having on society through investigating the impact of online social transparency on the enterprise.

Since transparency in this thesis presents a social phenomenon, the system development process needs a modelling approach that considers the social understanding and analysis of the system. *i** modelling approach is an attempt to bring social understanding into the system engineering process by recognising the primacy of social actors (Eric et al. 2011). It views actors as being intentional, i.e., they have goals, beliefs, abilities, and commitments, and present a clear visualisation what does each actor do? How do they achieve what they want? and who they depend on to achieve what they want (Yu 2009). Figure 15 presents an example of an enterprise goal model.
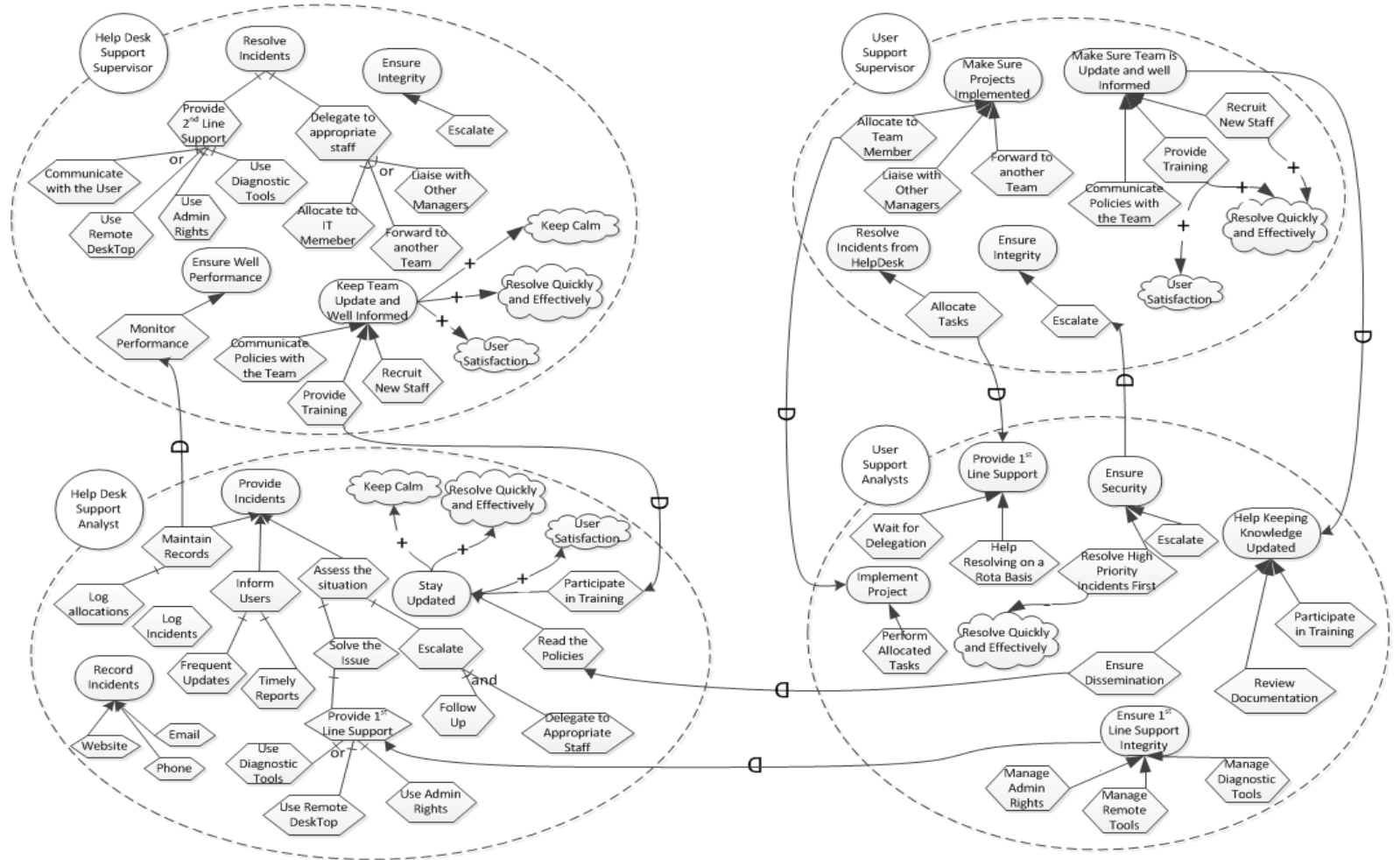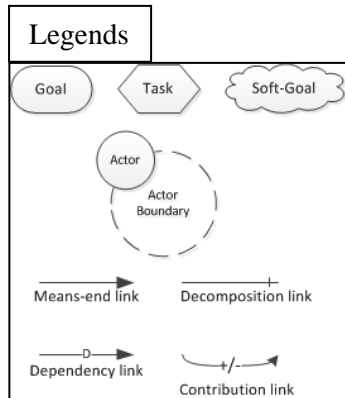
FIGURE 15: EXAMPLE OF ORGANISATIONAL GOAL MODEL

Legends

Symbol	Meaning
Goal	Goal
Task	Task
Soft-Goal	Soft-Goal
Actor / Actor Boundary	Actor / Actor Boundary
Means-end link	Means-end link
Decomposition link	Decomposition link
Dependency link	Dependency link
Contribution link	Contribution link

2. Setting common ground rules

This step is required to set the common ground rules for the assessment process. Ground rules articulate a set of expected behaviour for staff participation in the assessment process. The assessment team alongside with the enterprise management collectively decide the following ground rules:

➢ The number of observations that should provide per person e.g., At least two observations per person

➢ The period for providing the observation, e.g., per week, two weeks or a month.

➢ The round of the assessment process, e.g., monthly, quarterly or annually.

Since social transparency is a behaviour that occurs over time and differ based on staff context, making staff provide several observations increase the opportunity to capture the various context of problematic social transparency. Determining the period of providing the observations and the round of the assessment process allow the assessment team to compare the analysis of different periods and different round to ensure the effectiveness and successfulness of any proposed risk mitigation strategy. Setting ground rules play an important role in providing positive results from the analysis process and prevent issues from occurring that can interfere with the assessment process such as lack of participation. The assessment team must remind staff about the ground rules periodically, particularly if problems occur in the enterprise, for example, delays in achieving short term goals.

7.4.2   THE ACTION PHASE

The second phase of the assessment method is the risk identification and analysis process. This phase aimed to (i) provides system analysts and managers with actionable information from observation data, (ii) determine, through the tool, the risks and the factors that cause their occurrence and (iii) highlight the areas of social transparency that need more attention. Risk identification is one of the key topics in the enterprise development process. Sources of risks and their consequences need to be identified before they can be acted upon to mitigate (Ahmed et al. 2007). Some risks may be apparent to the development team while other risks may take more rigor to uncover. There are various methods to identify risks such as risk repository, checklist analysis, expert judgment, scenario-based method and documentation (Ahmed et al. 2007; Berg 2010). The analysis phase consists of the following three activities, which involve various techniques for risk identification and analysis.

7.4.2.1   PROVIDING THE OBSERVATIONS

In this step, staff are requested to provide observations and encouraged to use the ground rules set in the previous step for providing observations. As discussed in section 7.4.1.3, Staff were trained on the rationale and the steps of providing observation by using the observation sheet, presented in Table 14. This step is based on voluntary participation from staff to report their concerns regarding the social transparency of their peers. We previously mentioned that risks of social transparency is unremarkable in the workplace. Therefore, a technique such as voluntary self-reporting enables staff to provide information about their thoughts, feelings, or experiences of social transparency. Assessing social transparency is a new quality assurance procedure in the workplace, which makes staff hesitate to engage in the assessment method and provide observation. Engagement is an important concept in the assessment process, and the voluntary nature of providing the observations is important in overcoming the resistance of the staff. It also makes them freely give their time and express their true concerns about undesired behaviour of social transparency.

7.4.2.2   ANALYSING THE OBSERVATIONS

This step is the core actioning step in the assessment method of online social transparency. It is the base of the planning phase of the risk management process. In this step, the assessment team involves in the decision-making process by identifying and analysing the risks that appear in the enterprise social system. The researcher proposes an automated risk analysis tool used in this step to facilitate the analysis process. This tool designed to be a business intelligence (BI) tool that enables the assessment team to collect data from enterprise staff, prepare it for analysis, run queries against the data, and create reports and data visualisations to make the analytical results available for decision-makers. After collecting the data from the staff and feeding them to the database. In this research and for the purpose to approve the concept, the assessment team was required to enter the following data:

➢ The number of staff in the enterprise
➢ The data collected from the observation sheets to the risk analysis tool.

As previously mentioned, that the tool was designed to present an interactive dashboard to enable the assessment team to run queries and create reports for decision-makers. The interactive dashboard can be used to generate two types of analysis reports: (1) tool-based reports that generated automatically in the tool and (2) discussion-based reports that generated based on the discussion amongst assessment team members with the use of the tool and enterprise modelling (goal model).

1. Tool-based reports

Since online social transparency is practiced on the day to day life of the enterprise staff, there is a high chance for the data to become bigger in the volume, variety, and velocity. Volume refers to the amount of the data; variety refers to the types of the data and velocity refers to the age of data (Larson and Chang 2016). Recently, the enterprises focus more on analysis that utilise fast analytics to support the decision-making process. This risk analysis tool designed to be an interactive tool that analyse, monitors, and visually displays key business observations. This tool allows assessment team to interact with the observation data and enabling them to make well-informed, data-driven and healthy business decisions. The interactive dashboard in this tool is connected with several graphs and charts. Therefore, the results also supported with visual presentations that enhance the understanding of generated results and reveal an obvious pattern and trends. This dashboard can be used also to generate decision-based reports that will described later. The risk analysis tool generates the following analysis results automatically.

1.1. General Information

The tool can provide useful information from raw data to enable the assessment team and enterprise management to take an overall insight into the risk analysis process. The goal of the risk analysis process is to understand each specific instance of risk. Therefore, we identified four factors that we argue they can be used as indicators of the level of social transparency risks. Since the assessment method has an iterative nature, these factors can also be used for comparison with previous analysis results. The validation of these proposed factors is evaluated in the next chapter. Figure 16 presents these factors which are generated automatically based on specific calculation.

General Information			
Observations Total	Observers Total	Participation Rate	Communication Rate
49	9	20%	42%
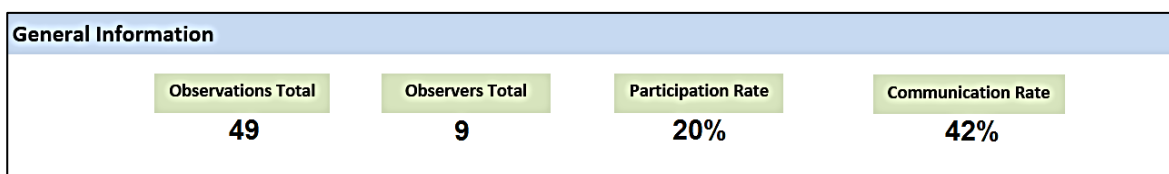
FIGURE 16: GENERAL INDICATORS FOR RISK LEVEL

Observations Total: it refers to the number of observations provided by enterprise staff. Number of observations provided by each member is identified by the assessment team and management in the ground rules step, described in section 7.4.1.4. We suggest that a high number of observations can be a sign of a high level of social transparency risk. Due to the voluntary basis of providing the

observation, then a high volume of observations can be considered as high complaints against the practice of social transparency through online platforms. A comparison between the total observation for all members (named **AllEmployeesObservations**) in the enterprise and the real number of provided information (named **RealProvidedObservations**). For example, if the enterprise has 60 employees and each one can provide up to 3 observations then **AllEmployeesObservations = 180 observations.** If 16 employees provide their observations since each one doesn't need to provide 3 observations, then **RealProvidedObservations = 49.** Comparing these two numbers can give insight into the level of social transparency risks.

<u>**Observer Total:**</u> it refers to the number of employees who provide observations. This number can be generated by counting the observer ID without duplications. Similar to the previous factor, we argue that high number of observers is also a sign of high level of social transparency risks.

<u>**Participation Rate:**</u> it refers to the number of employees who observed undesired social transparency as % of the enterprise population. A high number of participation rate can be an indicator of problematic social transparency. We calculate the participation rate as follows:

Participations rate = (Number of observations / Total number of employees in enterprise) x 100

<u>**Communication Rate:**</u> it refers to the number of employees who discuss the issue of social transparency with their peers. Increasing the risks of social transparency can be a sign of some problems in the communication and relationship between employees. Therefore, the tool can provide the communication rate amongst employees by calculating:

Communication rate = (No. of employees who discussed their concerns with observee / Total number of employees in enterprise) x 100

1.2. Observation related information

This section of the tool's dashboard, presented in Figure 17, provides overall analysis results based on the observations including their dates, online platforms, observer roles, observee roles and information types. This section presents the analysis results of the information collected from the first part of the observation sheet. The analysis result provided in a visual format to enable the assessment team and management to skim over the results to identify the areas that need more attention.

Visualisation of risk analysis results has been considered an effective technique to support risk communication with stakeholders (Roth 2012). Risk communication is defined as purposeful exchange of information between interested parties about (i) the level of the risk, (ii) the significance of the risks or (iii) decision, an action aimed at managing the risks (Covello et al. 1986). Studies on risk communication stated that visualisation of risk analysis results has desirable properties that enhance the understanding of numerical results of risk analysis (Lipkus and Hollands 1999; Aakko 2004). It was stated that graphics could view data patterns that may difficult to detect; for example, line graphs are good in conveying trends in the data (Shamo et al. 1996). Some types of graphs and diagrams evoke automatically some mathematical operations. Risk analysts may use graphical format to view and interpret the numerical information depicted in diagrams; for example, in the task of comparing risks, certain visualisation allows the observer to process effectively the information than when numerical information presented alone (Lipkus and Hollands 1999). Moreover, unlike numerical information, the visual representation can attract observers' attention because they present information in concrete and visual format (Figueres-Esteban et al. 2015).

This section of the tool includes a list of dates to allow the users to customise the results based on the selected date. This feature helps the system analysts and managers to identify the dates that have significant observations. The tool was designed to provide charts for the following analysis results:

- **Observation by online platform:** This chart presents the observations related to the used online platforms. In the observation sheet, employees were asked to provide information about the

online platform used for social transparency. This chart will help the system analysts and managers to easily identify the platform that has the most concerns about practicing social transparency. Risks of social transparency may result from limitations of the platform features that hinder the employee from providing full reasoning and explanation.

- **Observations by date:** This chart shows the dates that have more observations in terms of days or months. This chart will help system analysts and manager to determine the dates that have more reported social transparency concerns. These dates may relate to significant actions that happen in the organisation that may affect the organisational work such as deadlines, meetings and urgent announcements. Identifying the date may help the management to consider a plan to reduce social transparency risks in certain important dates.

- **Observation by observer role:** employees, who observed undesired social transparency behaviour, were asked to provide their roles in the observation sheet. This information will help in indicating the roles that affected by social transparency. Some roles in the organisation have a significant value in the organisation and if their work affected by social transparency that would affect the organisational overall productivity. For example, the roles that accompanied by one person and has no alternative.

- **Observations by observee role:** Observee represents the person who provides social information through an online platform. This bar chart displays the roles that caused concern to their colleagues due to their unplanned practice of social transparency. Awareness of observee roles helps the system analysts and management to identify the characteristics of the employees who may cause concerns for their colleagues. This is also would narrow the circle if further investigation is needed.

- **Observation by information type:** This bar chart represents the type of information reported in each observation sheet. Five information types have been priorly identified in the observation sheet. Identification of the information type that may cause more risks in the workplace would help the system analysts and managers to consider these types in the planning for the mitigation process. For example, reducing the social information in the conversation channels that created to discuss the work in projects.

1.3. Risk related information

This section of the tool's dashboard linked to the second part of the observation sheet. It presents the analysis results that related to the observed risks, including the information type, and the activity influenced, the observer who experienced the risk, the observee who caused that risk, observer opinions in terms of the actions needed and concern level. The results in this section are presented in four groups: (i) observed information, (ii) risks and related activities, (iii) observer and observee and (iv) observation quote. Each section displays the results in the form of a list generated from the data collected by the observation sheet. Figure 18 shows the results sections related to risk information.
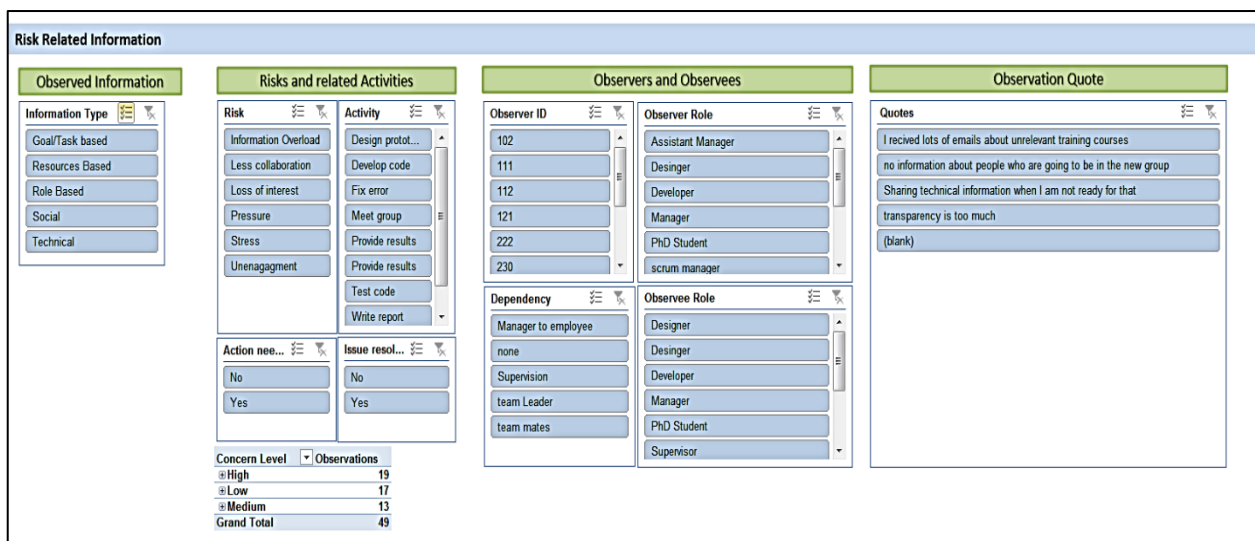
FIGURE 18: FOUR GROUPS OF RISK RELATED INFORMATION

The tool is supported by filtering, multi-selecting and zooming features that enable the assessment team to view the data in a holistic and also customised way. This is an interactive part of the dashboard which enables the assessment team to run enquiries to get useful information and create reports. These enquiries can be created on-demand and develop gradually from simple to complex. The following are the features that provided in the tool:

- **Filtering:** this feature enables the users to customise the results based on their selection from the list. For example, clicking on the **goal-based** choice from the list **Observed Information** will filter all the results in the dashboard to display only the results related to goal-based information. The results related to the selected option appear as active blue cells while the excluded results appear as faded blue cells. This filtering also customised the results in the following sections: (i) Observation related charts, (ii) Risk related Information and (iii) Risk factors information. The filtering can be cleared by clicking on the clear filter symbol at the right top corner. Figure 19 is

an example of the customised results after filtering. The following are examples of the enquiries that can be generated by using the filtering function:

➢ What are the risks reported by the developers who work in the design of Project X?

➢ Who are the employees reported as providers for social information?

➢ Who is the observer role that have a high concern about a specific type of information and needs urgent actions?

➢ What are the risks that not resolved friendly with observees, and they need urgent actions?
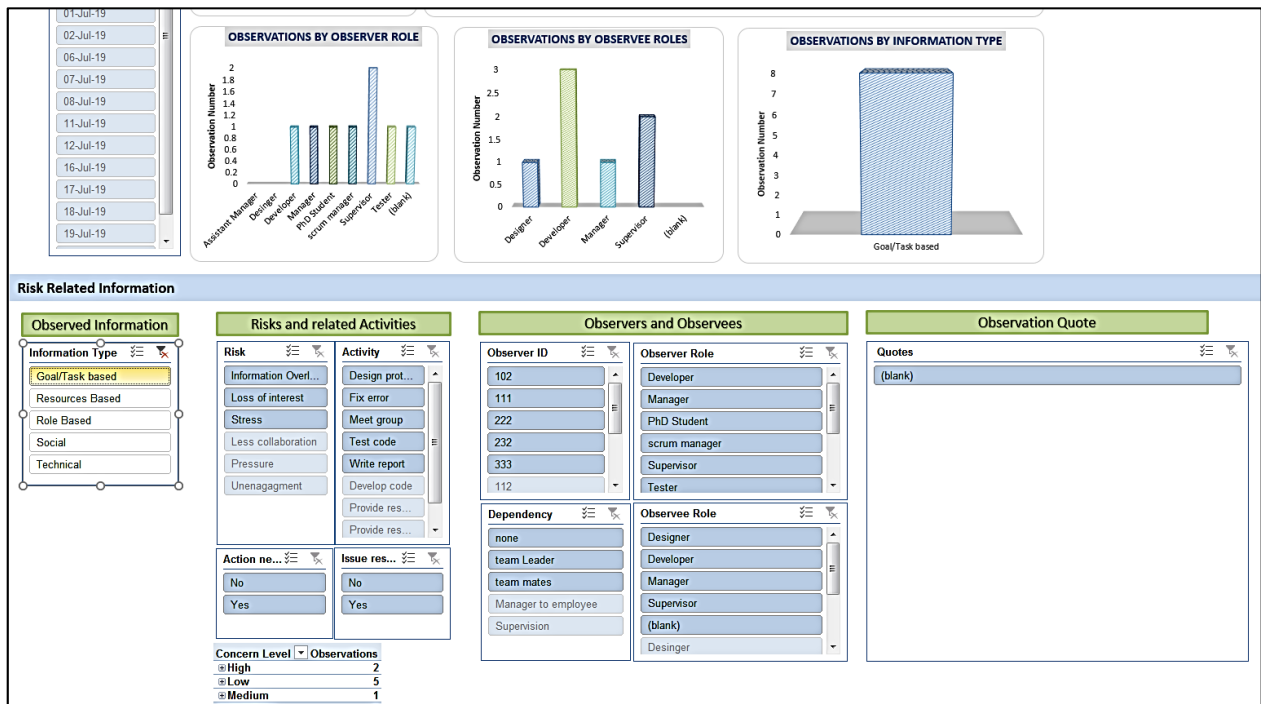
FIGURE 19: FILTERING FEATURE IN THE RISK ANALYSIS TOOL

• **Multi- Selection:** this feature allows the users to filter the results based on multiple selections in one list. For example, the user can choose more than one option from the same list in the **risk related information** section to customise the results based on these selections. By using multi-selection function, the user can easily find answers to complex enquiries that include several searching parameters. For example, searching about the information type that causes low engagement, less motivation and loss of interest to investigate the resource for employee demotivation. Figure 20 is an example of choosing two searching parameters in the **Observed Information** list in the tool.
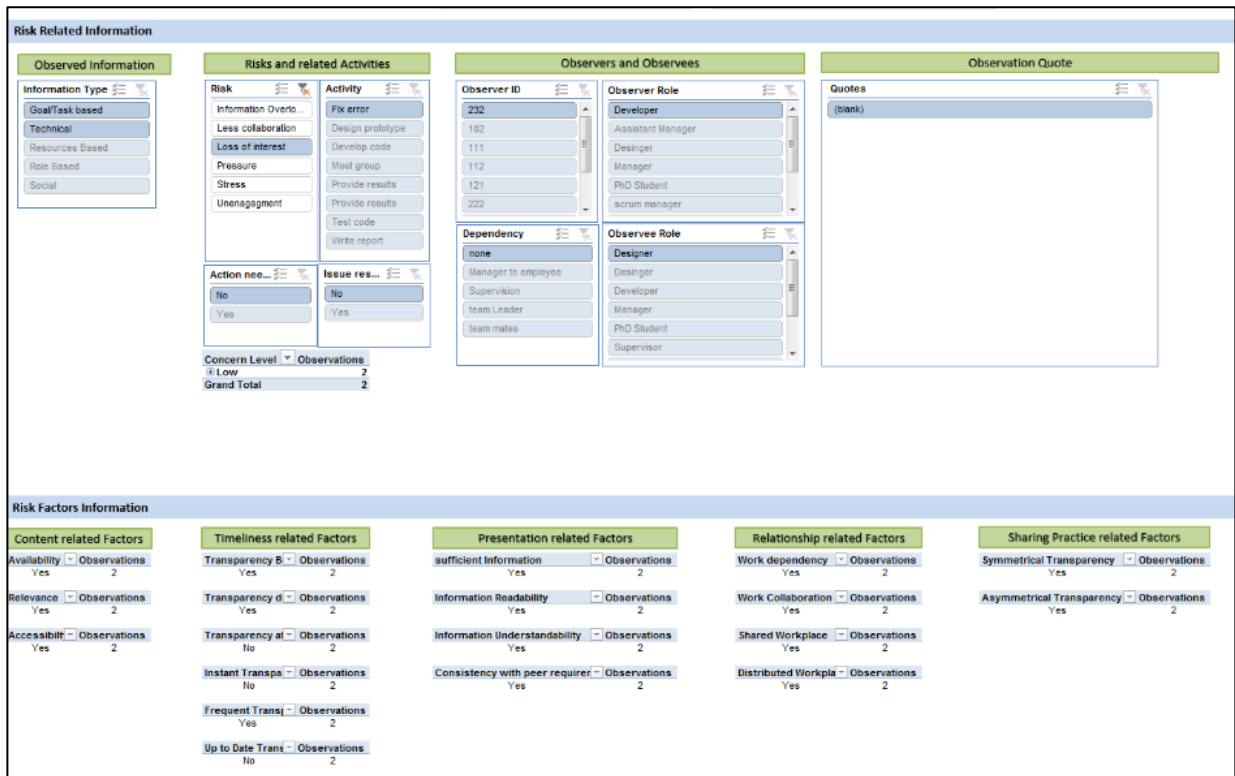
FIGURE 20: MULTI SELECTION FEATURE IN THE RISK ANALYSIS TOOL

- **Show/Hide feature:** this feature allows the user to exclude some information from the analysis results. This feature applies to the information that displays in a table format such as concern level information and risk factors information. This feature enables the assessment team to focus on the key parameters that have a crucial influence on their organisation productivity. Figure 21 shows an example of the show/hide feature in the **concern level** list.
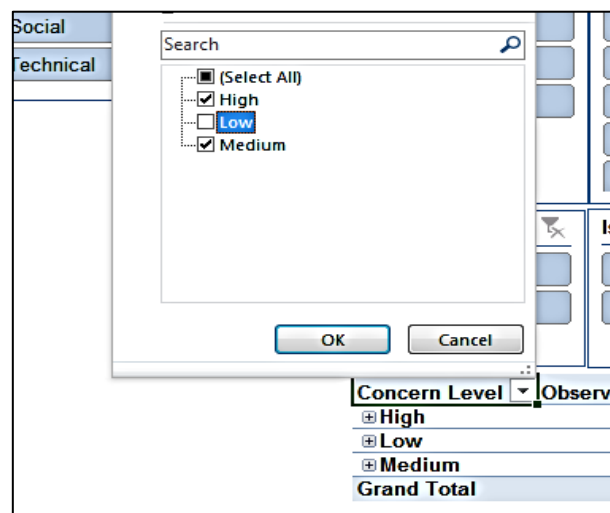
FIGURE 21: SHOW/HIDE FEATURE IN THE RISK ANALYSIS TOOL

1.4. Risk factors-related information

The last section of the tool is also linked to the second part of the observation sheet which collects data about the factors that cause the observed risks. This part of the tool was designed based on the findings discussed in sections 5.3 and section 6.3. This section presents the results of risk factors information into two formats: Numerical and visual presentation.

- **Numerical presentation of risk factors**

  Figure 22 shows the numerical analysis results related to the risk factors. The numerical results in this section are adjusted based on the running enquiries in the section (risk related information). For example, if the assessment team needs to know what the activity is influenced by the risk **"loss of interest",** the numerical analysis of risk factors will present the factors that caused loss of interest and how many employees report against these factors. Before running enquiries, this section presents all numerical analysis related to all risk factors.

Risk Factors Information

| Content related Factors		Timeliness related Factors		Presentation related Factors		Relationship related Factors		Sharing Practice related Factors	
Availability ▼	Observations	Transparency B ▼	Observations	sufficient Information ▼	Observations	Work dependency ▼	Observations	Symmetrical Transparency ▼	Observations
No	12	No	35	Yes	37	No	12	No	12
Yes	37	Yes	14	No	12	Yes	37	Yes	37
Relevance ▼	Observations	Transparency d ▼	Observations	Information Readability ▼	Observations	Work Collaboration ▼	Observations	Asymmetrical Transparency ▼	Observations
No	12	No	12	No	12	No	12	No	12
Yes	37	Yes	37	Yes	37	Yes	37	Yes	37
Accessibilt ▼	Observations	Transparency a ▼	Observations	Information Understandability ▼	Observations	Shared Workplace ▼	Observations		
No	35	No	32	No	12	No	12		
Yes	14	Yes	17	Yes	37	Yes	37		
		Instant Transpa ▼	Observations	Consistency with peer requirer ▼	Observations	Distributed Workpla ▼	Observations		
		No	32	No	12	No	12		
		Yes	17	Yes	37	Yes	37		
		Frequent Trans ▼	Observations						
		No	12						
		Yes	37						
		Up to Date Trans ▼	Observations						
		No	32						
		Yes	17						

FIGURE 22: RISK FACTORS SECTION IN THE RISK ANALYSIS TOOL

- **Visual presentation: Pareto Analysis**

  it is a statistical technique in decision-making used for the selection of a limited number of tasks that produce significant overall effect (Grosfeld-Nir et al. 2007). It is one of the seven basic tools that identified as being most helpful in analysing issues related to quality. Pareto analysis is used to highlight the most important amongst a set of factors. In transparency assessment method, it represents the most common sources of risks, the highest occurring type of risk factors, and the most frequent reasons for staff complaints about social transparency. Several visualisation tools generate Pareto chart for general purposes. The risk analysis tool designated to specifically highlight the important risk factors related to social transparency issues. Figure 23 is an example

of Pareto chart. It contains bars and a line graph, where the bars represent the number of staff observations for each factor in descending order, and the cumulative total represented by the orange line. Pareto analysis uses (80/20) principle which represents that a vast majority of the risks (80%) are produced by a few key issues (20%). This technique is also called the vital few and the trivial many. The value of the Pareto principle for enterprise management is that it reminds them to focus on the 20% risk factor because that 20% produce 80% of the risks. The chart generated automatically in the risk analysis tool. The following steps are used to highlight the crucial risk factors that need more attention.

1. Draw the line at 80% on the right y-axis running parallel to the x-axis
2. Drop the line at the point of intersection with the orange curve on the x-axis
3. The factors that are in the left of the line is the vital factors and the factors on the right of the line are the trivial and less important factors
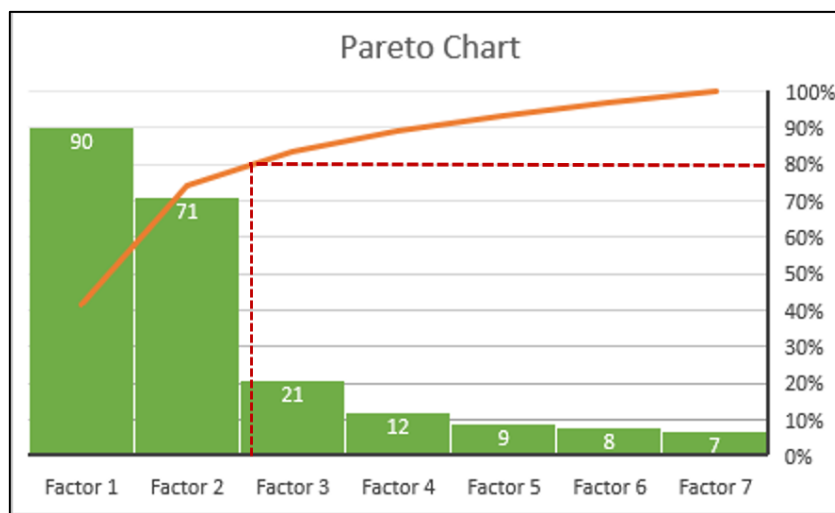
FIGURE 23: EXAMPLE OF PARETO CHART

It was discussed early in this research that risks of social transparency can be produced as a result of either the existing or missing of certain factors related to the content, presentation, timeliness, employees' relationships and sharing practice. For example, one of the observations in our previous studies reported that **loss of interest** is one of the risks that occur as a result of transparency about unclear descriptions of the collaborative tasks and also as a result of lack of transparency about the task priority. Another example is **pressure** which can be introduced as a result of transparency about less interest in preforming collaborative tasks and also can be introduced as a result of a lack of transparency about the task progress. For this reason and to highlight separately the existing factors and the missing factors, the risk analysis tool generates automatically two types of Pareto charts, one for the existing factors and the other for the missing factors, to precisely indicate the factors that have a role in the occurrence of certain risks. In the observation sheet, each observer has to indicate the

existing and the missing of the factor by answering "Yes" or "No" next to the observed factors. Figure 24 presents two Pareto charts: the one on the left-hand side for the existing factors and the one on the right-hand side for the missing factors.
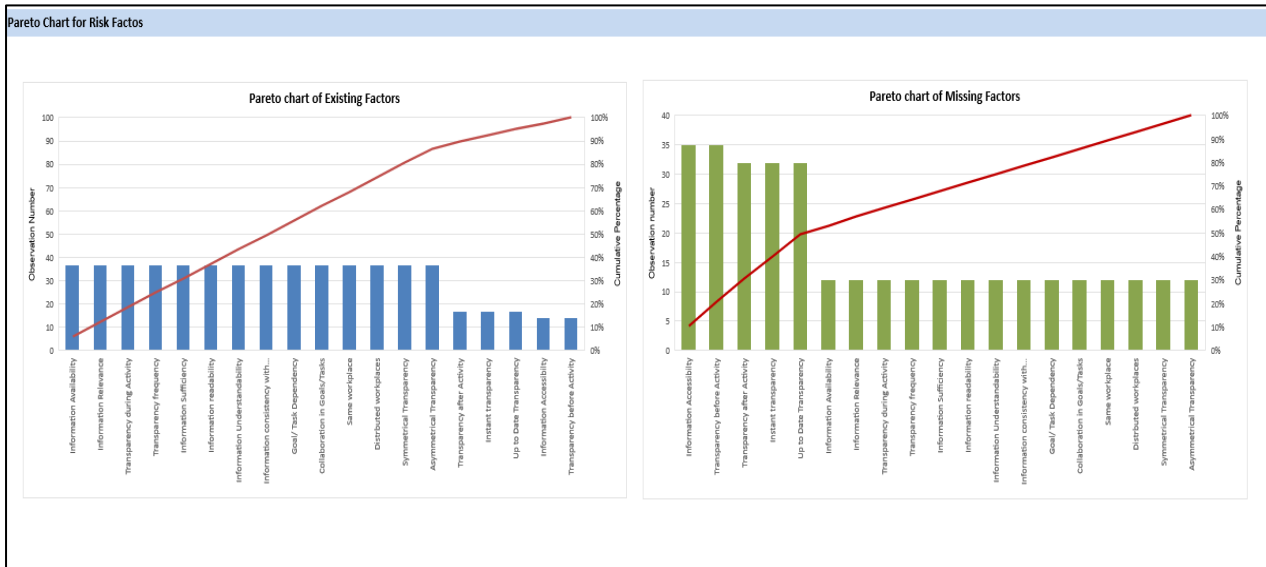
FIGURE 24: PARETO CHARTS FOR RISK FACTORS ANALYSIS

2. Discussion-based reports
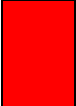
One of the concepts that need to be understood before undertaking any risk decision-making process is "what is the risk?". From the perspective of risk analysts, this concept can be interpreted either as identification of the potential risks and their factors or as identification of the impact level of the observed risk on the workplace environment. In the previous sections, risk identification and analysis techniques were generated automatically based on the analysis of the staff observations. In this section, the following risk analysis techniques are generated collectively based on a discussion amongst the members of the assessment team with the use of the risk analysis tool and enterprise goal model.

2.1. Goal-based Risk Ranking Technique

It is a tool that can be used by the assessment teams to evaluate the severity of the identified risks in the work environment. This can be performed by evaluating the impact of their occurrence in certain tasks and goals. In risk management, there is no one simple or single way to determine the level of risk. Ranking hazards requires the knowledge of the workplace activities, the urgency of situations, and, most importantly, objective judgment. For simple or less complex situations, an assessment can

be a discussion or brainstorming session based on knowledge and experience. In some cases, checklists or a probability matrix can be helpful. For more complex situations, a team of knowledgeable professionals who are familiar with the work is usually necessary. From the use of risks analysis tool and goal model, team assessment and enterprise management would be able to rank risks and organise them in various impact levels. Table 15 shows an interpretation of each impact level.

TABLE 15: RISK IMPACT LEVEL

Catastrophic		The risk has a major effect on enterprise productivity in terms of quantity and quality and requires urgent actions. For example, lack of collaboration and engagement due to lack of transparency
High		The risk has a significant effect on the enterprise productivity in terms of quantity. For example, social loafing in collaborative tasks
Critical		The risk has a minor effect on the enterprise productivity and needs action to improve the system. For example, information overload due to excessive transparency
Marginal		The risk can be avoided by individual strategy. For example, stress that stems from a certain task can be avoided by trying one of the alternatives of that task

In the proposed assessment method, activity refers to either goal or task that influence by the occurrence of certain risks. We assume that activity is represented by one role, without consideration of individual instantiation and differences. For each activity, the assessment team will use the analysis tool and goal model to:

1. Select the risk that needs to be ranked from the risk list.
2. Determine the activities affected by the selected risk from the activity list.
3. Select one activity at a time.
4. For each selected activity, determine the actors (observers) who perform this activity from the observer list.
5. Select one actor (observer) at a time.
6. In the goal model, determine the affected actor (observer) who perform the selected activity.
7. Check activity properties by using the risk impact checklist, presented in Table 16.
8. Rank the risks based on their impact on each activity in the risk-ranking matrix in Table 17.
9. If there is more than one actor who performs the selected activity, return to step 5 to choose the next actor and check activity properties.
10. If all affected actors are checked, the risk impact will be decided based on the team discussion.
11. Return to step 3 to select another activity affected by the selected risk.

Catastrophic	- If activity has a positive contribution to a soft-goal - If activity has no alternatives - If activity has dependency from another task/ goal/ resource/ soft-goal - If activity is part of AND decomposition
High	- If activity has no alternatives - If activity has dependency from another task/ goal/ resource/ soft-goal - If activity is part of AND decomposition
Critical	- If activity is part of OR decomposition with one alternative - If activity has dependency from another task/ goal/ resource/ soft-goal
Marginal	- If activity is part of OR decomposition with more than one alternative - If activity has no dependency from another task/ goal/ resource/ soft-goal

Template of Risk Ranking Matrix

The assessment team uses the following template, presented in Table 17, to organise impact of the risk of each activity. Some risks may have different impacts that occur in two different activities. For example, information overload may occur in some activities as catastrophic risk and critical risks. This template enables the assessment team to have an insight into the impact of the risks on the enterprise activities. This analysis technique helps enterprise management to make an informed decision to plan for a mitigation process to the risks with a higher impact on the enterprise activities. Decisions of the impact of the risk rely on a discussion amongst the assessment team and enterprise management because they know well the enterprise strategy and, which activities have a high impact on enterprise productivity.

TABLE 17: RISK RANKING MATRIX

	Activity 1	Activity 2	Activity 3	Activity N
Risk 1				
Risk 2				
Risk 3				
Risk N				

Illustrative Example:

If the assessment team analysed the observations by using the tool and found a set of risks includes **information overload**, **lack of collaboration**, **loss of interest** and **stress.** The assessment team followed the previous steps and uses the goal model presented in Figure 15 in section 7.4.1.2 to determine the impact of these risks.

Step 1. The assessment team suggested to rank the risk **lack of collaboration.**

Step 2. The assessment team determined 3 activities affected by the selected risk which are "Keep the team updated", "Communicate policies with the team" and "Inform users".

Step 3. The assessment team suggested to check the first activity.

Step 4. They determined four actors perform this activity who they are help desk support supervisor, help desk support analyst, user support supervisor and user support analyst.

Step 5. They suggested to start with the help desk support supervisor as a first actor for this activity

Step 6. They used goal model to check the activity properties in the actor's goal model.

Step 7. By using the impact checklist, they found that the selected risk has a **catastrophic** impact on this activity for the help desk support supervisor.

Step 8. They added the risk impact into the risk ranking matrix.

Step 9. They returned to step 5 to check the activity for another actor and redo the same steps again.

Step 10. If they finished the actors for the first activity, they decided the impact of the risk based on its impact on the organisational productivity and performance.

Step 11. They can return to step 3 to choose another activity and redo the same steps again. At the end of the ranking process, they created a risk ranking matrix similar to the following matrix.

Based on the impact checklist, risks will be catastrophic if influenced a goal such as "Keep team updated and well informed", high if it influenced a task such as "Delegate to appropriate staff" and "Monitor performance", critical if it influenced a task such as "Allocate to team member" and marginal if it influenced a task such as "Use remote Desktop".

	Use remote Desktop	Delegate to appropriate staff	Keep team updated	Activity N
Information overload		 		
Lack of collaboration			 	
Loss of interest			 	
Stress	 	 	 	

2.2. Goal-based Risk Stakeholders Wheel

In the planning phase of risk management, enterprise management, system analysts and the assessment team need to pay attention to mitigating risks that have a wide impact on the enterprise. The stakeholder wheel is one of the techniques that used to determine the direct and indirect consequence of a particular change. In our method, we will modify the stakeholders' wheel to represent the direct and indirect stakeholders that are influenced by the occurrence of certain risks.

Stakeholders wheel diagram is a tool that used to identify the direct and indirect results of a certain trend, event, and decision. Figure 25 shows an abstract presentation of the stakeholders' wheel diagram. Assessment team with assistance from system analysts and managers can use the ranking risk template, goal model, and risk analysis tool to create risk stakeholders' wheel as follows:

1. Select the risk that has a severe impact form the risk-ranking matrix. For example, start with risk that has Catastrophic impact
2. Identify the stakeholders of the risk by following two steps:
   a. Identify stakeholders directly from the analysis tool in case the participants reveal their roles in the observation sheet.
   b. If the participants did not reveal their roles, identify the activities that affected by the risk from the analysis tool and then use the goal model to:
      i. Determine the first related stakeholders (Direct stakeholders) by listing the actors (Roles) who perform this activity
      ii. Determine the second related stakeholders (First indirect stakeholders) who depend on the direct stakeholders on the identified activity
      iii. Determine the third related stakeholders (Second indirect stakeholders) who depend on the first indirect stakeholders on another activity
3. Return to step 1 to choose another risk from the risk ranking matrix and start a new risk stakeholders' wheel.

4. Once the stakeholder's wheels for all risks are completed, the assessment team can get a clear overview of the direct and indirect stakeholders who may influence by the occurrence of the identified risk

With the use of the risk ranking and the risk stakeholders' wheel, enterprise management would be able to priorities the risks that require immediate actions. Risk with a wider wheel may need more attention to start the mitigation process.
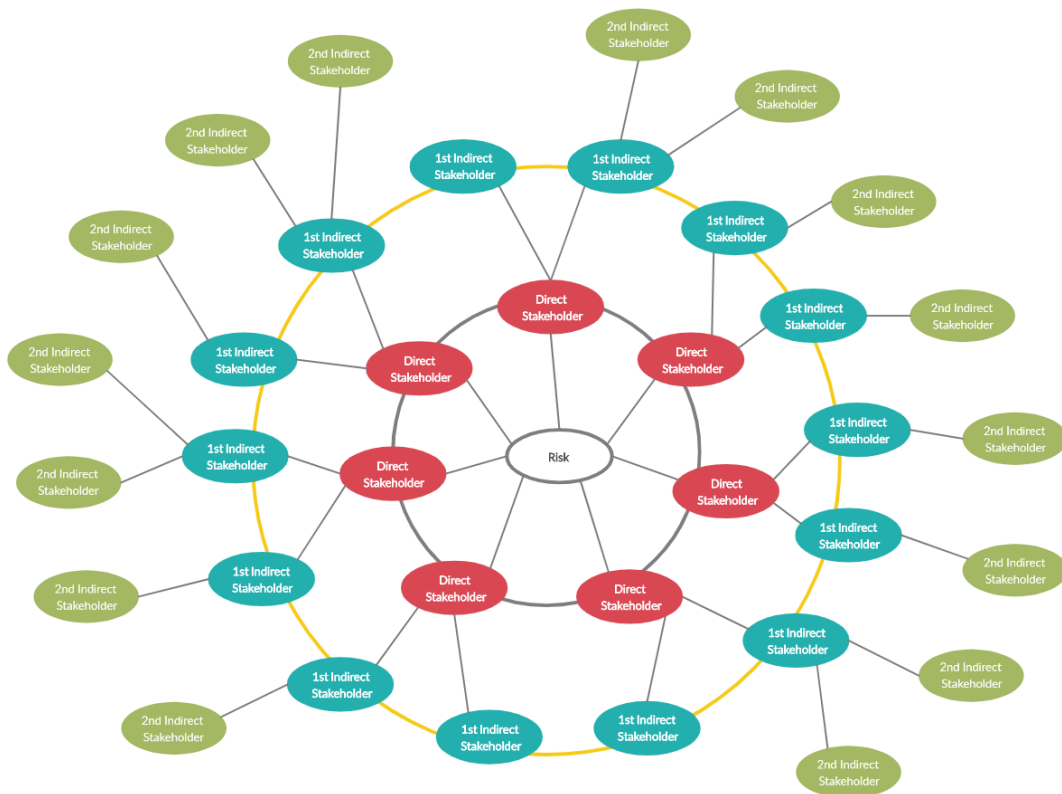
FIGURE 25: RISK STAKEHOLDERS WHEEL

Illustrative Example:

If the assessment team decided to build risk stakeholders wheel for the risk that has a catastrophic impact. They would start with a **lack of collaboration** in the activity **"Keep team updated"**. They can use the risk analysis tool to identify the observers who reported this risk. Those observers will be added to the stakeholder wheel as direct stakeholders. The activity exists in two observers who they are **help desk support supervisor, help desk support analyst**. They can use the goal model in Figure 15 to identify the stakeholders who may be affected by the risk. It was mentioned in section 7.4.1.2 that the revealing of the observer role is optional, and some employee might not reveal their roles. Therefore, from the goal model, the assessment team can identify the direct stakeholder who they are not revealed in the observation sheet by checking the actor who

performs the selected activity. In this example, they can see that **"Keep team updated"** is also exist in the **User support supervisor**. Then, they can use the goal model to determine the indirect stakeholders who might have a dependency on the selected activity. They can find that **user support analyst** is one of the indirect stakeholders who has a dependency with user support supervisor.

7.5   CHAPTER SUMMARY

This chapter presents the main goal of this research. It was mentioned in Chapter 1 that this thesis aims to propose a systematic method to assess the risks of online social transparency. In this chapter, an assessment method for online social transparency was proposed and described. This method focuses on identifying and assessing the risks of the voluntary nature of social transparency in online enterprise platforms. The proposed assessment method consists of two main stages: (i) preparation stage involves four steps and (ii) the action stage involves two steps. These stages supported by risks analysis tool and goal-based risks analysis techniques to support the decision-making process. In the next chapter, this method and its supporting materials will be evaluated in real organisational context to examine its helpfulness and effectiveness in identifying and assessing the risks of online social transparency.

In the previous chapter, a description of the assessment method and the supporting materials were provided. The assessment method consists of two main phases: (1) The Preparation phase that includes an illustration of the online social transparency concept and the potential causes of negative consequences that stems from its unguided practice, educate employees how to report an observation about undesired social transparency and create an assessment team and educate them in using the analysis tool and techniques, (2) The Action phase that includes a creation of the enterprise goal model, analyse the collected observations and extract the reported risks and their impact level on the work environment and internal stakeholders.

In this chapter, the assessment method will be evaluated from the perspective of its role in assessing the online social transparency and facilitating the identification of the risks and the factors that lead to their occurrences. The evaluation study in this research is based on a qualitative case study approach. This approach provides tools for researcher to study complex phenomena within their contexts (Baxter and Jack 2008). This approach is valuable method for researchers to develop theory, evaluate programs and develop interventions (Baxter and Jack 2008). Applying qualitative case study in this research helps in building confidence in the assessment constructs and evaluate if the proposed method covers the stakeholders needs and expectations in identifying the risks of social transparency in their work environment. Moreover, this study evaluates the extent to which the assessment method supports stakeholders' decisions (managers and analysts) in analysing the risks, assessing their severity and effect, which leads to better mitigations planning of the risks of online social transparency.

8.1   THE EVALUATION AIM

The aim of the evaluation study is to assess the extent to which the proposed method provides an enhanced customisation method that aids system analysts and management in assessing online social transparency and detecting the potential risks and their factors. It also aims to examine the usability of the assessment method and it's supporting materials in terms of the following aspects:

1. **Understandability:** is the aspect that the assessment process and its supporting materials are presented in a way that makes it easy for users to understand them. The assessment process and its supporting materials are designed to be understandable to users with a reasonable knowledge of risk analysis and risk assessment. The assessment process was built based on the voluntary participation principle. Therefore, adherence to a reasonable level of knowledge would motivate enterprise members to participate and engage in the assessment process.

2. **Comprehensive:** is the aspect that examines the assessment method in terms of the completeness of the explanation of its activities, the supporting materials, the roles involved in the assessment process and their responsibilities and the prerequisite knowledge needed for using the method and the tool. Comprehensive aspect of the assessment method covers all activities and steps required in order to detect potential risks and assess their impact. In addition, this aspect also covers all required documents that support users' understanding of the assessment method.

3. **Effectiveness:** is the aspect that ensures that the assessment method and its supporting materials help the users and decision-makers to effectively detect and assess potential risks of online social transparency.

4. **Helpfulness:** the evaluation study also examines to what extent the assessment method and its supporting materials facilitate and enhance the planning of the mitigation process of the identified risks.

In the evaluation session, the researcher will rely on the discussion and the practitioners' feedback to examine the ability of the assessment method to meet these criteria.

8.2 THE EVALUATION APPROACH

The evaluation study in this thesis follows a case study approach in order to evaluate the proposed assessment method in a real context. The case study approach is defined as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence" (Robson 2002). This definition captures most of the elements described in various definitions of case study research. This approach is suitable for the research that the real-life context is an important part of the study. According to Crowe et al. (2011), a case study can be used to describe, explain or explore the phenomenon in the everyday context and provide causal links from the development of this phenomenon. This approach can be used for explanatory or exploratory research (Saunders et al. 2009). Therefore, this approach usually collects data from multiple sources of evidence, using several quantitative (e.g., questionnaires) and more commonly qualitative methods such as interviews, focus groups, and observations. The use of multiple data collection method has been advocated as a way for study validation. This approach is well known as a desirable choice for evaluating the research that focuses on the development events or phenomenon within a real-life context (Yin et al. 2009).

For the nature of the social phenomena in this thesis, the case study is the appropriate approach to evaluate the proposed assessment method of online social transparency. The reason for conducting a

case study evaluation is to determine how the assessment method could help the users in the real context in determining the risks and their impact in their work environment due to the unguided practice of online social transparency amongst employees. We evaluated the assessment method from the perspective of real context to:

- Examine the effectiveness of the assessment method in detecting the risks of online social transparency from a real work environment and supports the managers in assessing the risk in terms of its effect on goals/tasks and identifying the affected stakeholders,
- Examine the ability of the assessment method to facilitate the collaborative decision-making process for risk mitigation planning,
- Examine the applicability of the assessment method to be adopted in a real work environment.

8.3 THE EVALUATION PROCEDURES

The evaluation study was divided into two stages.

- **Stage one:** Validate the applicability and reliability of the proposed assessment method and the supporting materials.
- **Stage two:** this stage consists of two phases. These phases are comparative, meaning they had the same goals but with different tools to facilitate comparative analysis. They were conducted one after another.
  - ➢ Phase One: Assess online social transparency without the aid of the proposed assessment method.
  - ➢ Phase Two: Reassess online social transparency with the aid of the proposed assessment method.

8.3.1 STAGE ONE: EXPERT CHECKING

This stage aimed to find out if the assessment method and the supporting materials are ready to be evaluated with different stakeholders and to address flaws before starting the case study evaluation. In this stage, the researcher recruited two managers from different work environments to review and validate the assessment method from a managerial point of view, including the observation sheet and risk analysis tool, to ensure that the assessment method is reliable and applicable.

8.3.1.1 PARTICIPANTS RECRUITMENT

The assessment method was built to target all kinds of work environments. Therefore, two managers from different companies were recruited. The **first manager** is a male and he is a project

leader in a software development company based in Germany. He has 12-years of experience in software architecture and system engineering. The **second manager** is a female and she is the head of the quality assurance unit in a non-profit educational organisation. She has 15 years of experience in requirement engineering and system analysis. This stage was conducted with managers for two reasons:

1. The assessment method designed based on employees' voluntary participation. Therefore, managers' opinions were essential to making the assessment method and supporting material acceptable and easy to use.

2. Managers review the assessment method from holistic requirements view that is suitable for all employees. Unlike managers, recruiting employees for this stage may result in complex and specific requirements based on personal needs.

8.3.1.2   SESSIONS' PLAN

The researcher conducted the following sessions with the two managers:

- **Induction session:**

    The researcher started this session by asking questions about the different kinds of online platforms used for social communication in each work environment. The aim of asking such kind of questions is to enable the researcher to exemplify using cases that relate to the participants' work environments. Then, the researcher introduced the concept of online social transparency and its negative consequences by providing relevant examples that show the risk areas of unguided practice of online social transparency amongst employees.

- **Evaluation session:**

    After familiarising the managers with the research problem and the rationale of the need for an assessment method, the researcher started the evaluation session by walking them through the assessment method and its supporting materials (i.e. observation sheet, risk analysis tool and goal-based risk analysis techniques) which described in section 7.4. Regarding the evaluation of supporting materials, the managers were asked to individually fill the observation sheet to assess the validity and usability of the observation sheet. Similarly, the manager was asked also to use the risk analysis tool and run different inquiries to test the efficiency and usability of the tool.

    In the session, managers were asked to follow the think-aloud method as they were performing the tasks and discuss their thoughts and opinions. During the evaluation sessions, the researchers were taking notes without interrupting the managers' discussion. At the end of the session, managers have come up with an agreement to add more details in the observation sheet. The managers

suggested some modifications only in the observation sheet to prevent potential demotivation and disengagement due to questions misperception or ambiguity clarity. Based on a discussion of the suggested modifications, some details have been added to the observation sheet to improve the usability and clarity of the questions, as will discuss later in section 8.4.1. Figure 26 illustrates the protocol of this session.
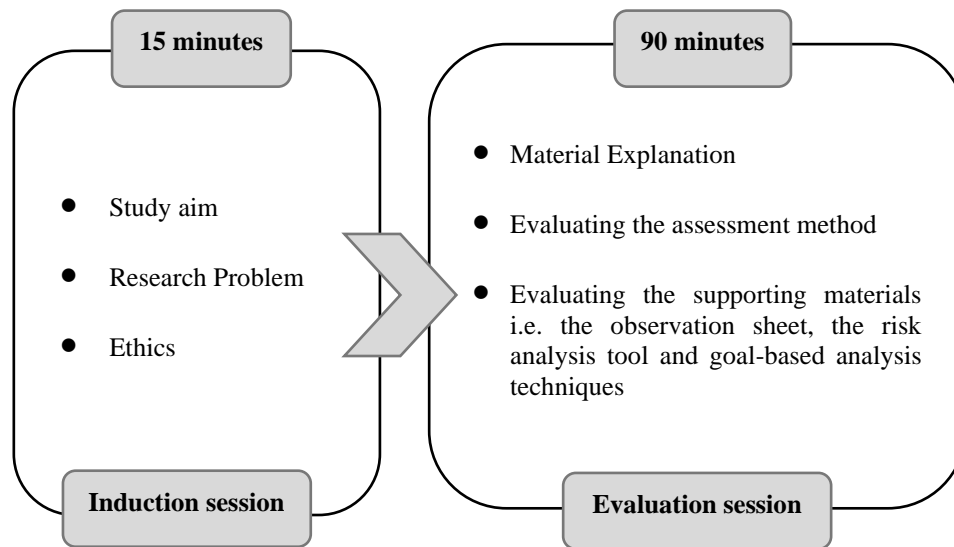
FIGURE 26: PROTOCOL FOR STAGE ONE

8.3.2 STAGE TWO: CASE STUDY

This stage aims to evaluate the assessment method by conducting a comparative evaluation. The evaluation study was conducted in a real company in order to obtain various opinions and ensure that the assessment method is suitable for a real work environment. The company is a non-profit educational organisation based in Alexandria, Egypt. This organisation has several activities in the fields of engineering, business science, and technology. The mission of this organisation is the contribution to the development of the society by offering comprehensive educational programs, high calibre centres for research, training, and consultancies. It is considered as a large organisation with about 4000 employees. Employees usually use E-mails, Facebook and WhatsApp for social interaction, coordination and collaboration with their colleagues, teams and managers.

The reason to conduct the evaluation study in a real company was mainly to examine the effectiveness of the assessment method in a company that may have different ways of risk identification and analysis. The risk identification and analysis in this company is part of the quality assurance department in the organisation. In order to identify risks in the workplace, the quality

assurance team require reports from all employees about their courses and they analyse these reports manually to identify the sources of weaknesses and faults.

In order to perform the comparative evaluation, this stage is divided into two phases:

- **Phase one:** it involves detecting and assessing risks of online social transparency in the work environment of the case study. The goal of this phase is to investigate how the participants would identify the risks of social transparency in their workplace and how they can use their own experiences to assess the impact of the identified risks. In this phase, participants were not provided with our proposed assessment method and the supporting materials.
- **Phase two:** it aims to also identify the risks of online social transparency in the case study but with the aid of the proposed assessment method and the supporting materials for collecting the risk related information and analysing the risk impact.

8.3.2.1 PARTICIPANTS RECRUITMENT

Risks of online social transparency are unremarkable in the work environment and decisions about the risks of online social transparency can only be extracted from the employees themselves. Moreover, these decisions can differ from one employee to another and in the same employee from time to time. Therefore, the assessment method in this research designed to involve volunteers from different roles in the enterprise, alongside management and system analyst roles, to create an assessment team and to contribute to the decision-making process. The assessment team in this evaluation study involved two types of participants. The first type represents employees (volunteers) from different roles in the enterprise, while the second type represents systems analysts and managers. The role of the two types of participants in the evaluation study is described in the following section. Involving employees from different roles will help in gaining a more holistic view of the organisation's work, having varied opinions that help in getting better feedback during the assessment process and complementing the need of multiple roles. The value of involving employees in the assessment process can be seen in the discussion of the result in section 8.4.3.

In this evaluation study, 8 participants were recruited, as described in Table 18. The participants play the role of the assessment team for their organisations. The assessment team involves volunteered employees who play a facilitator role in gathering information from organisational members and analyst role in assessing the risk and risk factors from the collected information with the help from system analysts and managers. All system analysts and managers have experience in software engineering, goal modelling and systems analysis. Some managers have a good level of experience in risk identification and risk analysis. The participants were recruited through personal

and professional connections and they were selected based on their availability and convenience to participate in the study. Critical topics such as social transparency, as defined in this research, can be seen as challenging to discuss conveniently in some enterprise due to its effect on the enterprise impression. Therefore, recruiting participants required a trust relationship between the researcher and the participants to effectively evaluate the assessment process and gain more information about the research problem.

TABLE 18: PARTICIPANTS DETAILS IN THE EVALUATION STUDY

Participant no.	Gender	Role in the organisation	Role in the evaluation study	Years of experience for system analysts and manager
1	Male	Software Architect	System analysts and manager	12
2	Female	Head of Quality Assurance	System analysts and manager	15
3	Female	The head of the college website maintenance Committee	System analysts	7
4	Female	The head of the Scheduling Committee	System analysts	4
5	Female	Teaching assistant	Facilitator	-
6	Female	Lecturer in CS	Facilitator	-
7	Female	Teaching assistant	Facilitator	-
8	Female	Office director	Facilitator	-

8.3.2.2   SESSIONS' PLAN

The evaluation study of the assessment method involves the following sessions:

1. **Induction session:** this session is similar to the induction session conducted in stage one. The induction session was held for about 30 minutes. The two types of participants (i.e. employees and system analysts) were involved in the same induction session to introduce the research problem and the aim of the study. The researcher started the induction session by asking about

the different kinds of online platforms used for social communication in the workplace. The aim of asking such kind of questions is to enable the researcher to provide examples and scenarios that are more related and familiar to their workplaces. Then, the researcher introduced the concept of online social transparency and its negative consequences by providing relevant examples and scenarios that show the risk areas of unguided practice of online social transparency amongst employees.

2. **Assessment session:** this session aims to identify and to assess the risks of online social transparency. This session divided into two phases. Each phase involved one or more sessions, based on the aim of the phase. The sessions of each phase are as follows:

   2.1 Sessions for phase 1: it was described in section 8.3.2 that this phase aims to identify risks of online social transparency without the aid of our proposed assessment method. Therefore, in this phase, both types of participants, i.e., the volunteered employees and systems analysts will be involved in this session to detect and analyse the risks of online social transparency in their work environment. This session lasted 2 hours. Figure 27 illustrates the activities for this phase. At the beginning of the session, the researcher introduced several concepts related to the assessment of online social transparency that resulted from different studies in this research. These concepts are:

   - **Types of risks**

     The participants were provided with a list of potential risks that may stem from the unmanaged practice of online social transparency. This step aims to familiarise the participants with different kinds of risks that might be unremarkable in their social transparency. The researchers provide examples of the contexts that may result in the occurrence of such risks. These risks were discussed earlier in chapter 5 and 6.

   - **Type of risk factors**

     The researcher also illustrates the different sources of risks and the factors that play a significant role in the occurrence of certain risks. These risk factors include the content of transparency, the presentation, and timeliness of transparency and the relationship between employees and the nature of sharing practice amongst employees. These risk factors developed from some studies in this research and discussed adequately in chapters 5 and 6.

   After introducing the previous concepts, the researcher provided the participants with some questions in order to identify the risk and risk factors of online social transparency in their

workplace based on their background of risk analysis. The following questions leaded the discussion in this session.

Q1: If you were a member of the assessment team of online social transparency in your company,

Q1.1: How would you identify the risk and risk factors of social transparency in your workplace?

Q1.2: How would you evaluate the impact of the risks on the work environment?

Q1.3: How would you rank the risks of social transparency (i.e. based on which metrics)?
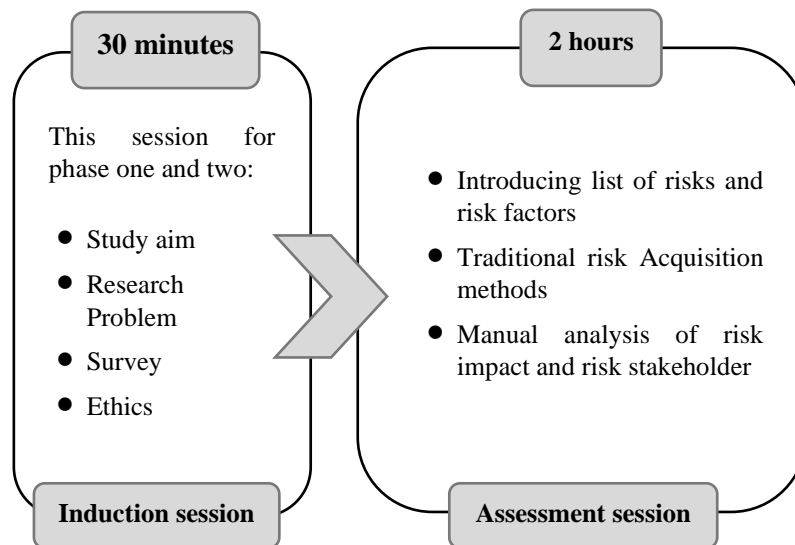
FIGURE 27: PROTOCOL FOR STAGE TWO OF THE EVALUATION STUDY (PHASE ONE)

2.2 Sessions for phase 2: This phase aims to identify the risks and risk factors of online social transparency and evaluate their impact on the work environment. Risk assessment in this phase performed with the aid of our proposed assessment method. This phase involved the following two sessions.

- **In the first session,** Facilitators were trained to use the proposed observation sheet, described in section 7.4.1.2. Facilitators were provided with a list of risk and risk factors presented in Table 12 and Table 13. Our assessment method was designed to engage employees as a tool to gather information about the potential risks of online social transparency. The facilitators were asked to distribute the observation sheets in their workplace and asked employees to fill them voluntarily. The session lasted for 30 minutes and facilitators were given 10 days to provide the collected observations from the employees. During the demonstration of the observation sheet, the researcher was taking notes of the facilitators' inquiries and questions as an evaluation of the observation sheet. Moreover, in order to obtain an adequate evaluation, a set of questions were listed at the

end of the observation sheet to allow employees to evaluate the usability of the observation sheet while filling the sheet, as shown in Table 19.

- **In the second session,** facilitators, system analysts, and managers were asked to use the data collected from the first session to perform two activities. The **first activity** aims to identify and assess the impact of the risks without the use of the risk analysis tool and goal-based risk analysis techniques. The **second activity** aims to redo the previous activity with the use of the risk analysis tool and goal-based risk analysis techniques. As preparation for this session, (i) the researcher introduced the concept of goal model and its notation; (ii) the researcher built a goal model for the participants' workplace and (ii) the participants were trained for the use of the risk analysis tool. Figure 29 presented an example of the goal model for one college in the educational organisation. The researcher was involved in this session as an observer for clarity and understandability purposes. This session lasted for 4 hours. At the end of the session, participants were provided with a survey to evaluate the assessment method and its supporting tools (i.e., risk analysis tool, goal-based risk ranking and goal-based risk stakeholders wheel). Figure 28 summarises the activities for phase two.
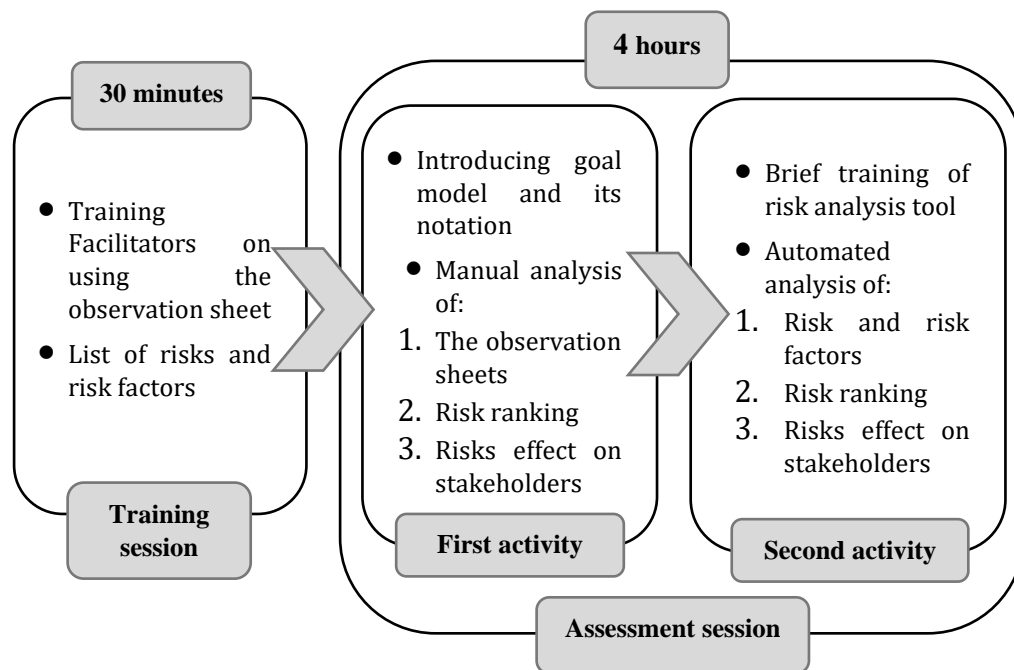
FIGURE 28: PROTOCOL FOR STAGE TWO (PHASE TWO)
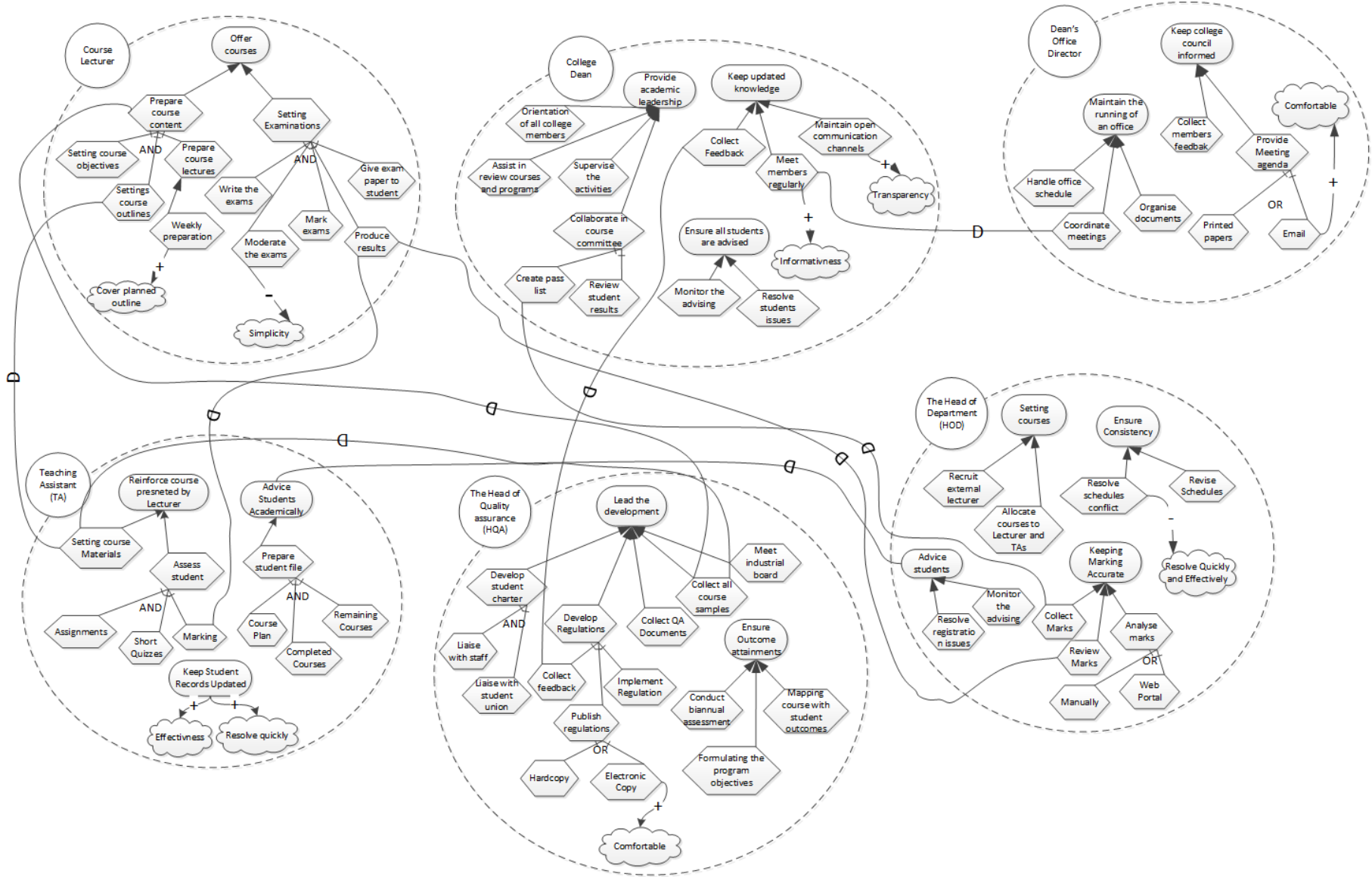
FIGURE 29: GOAL MODEL FOR ORGANISATIONAL INFORMATION SYSTEM

8.3.2.3   EVALUATION QUESTIONS

The evaluation study focused on examining the usability of the assessment method and determining whether the proposed method can (i) detect the risks and their factors of social transparency effectively, (ii) analyse the impact of the risks on the work environment. In order to provide a quality evaluation of the assessment method, the researcher designed an open-end qualitative survey. The evaluation study was conducted with two kinds of participants:

1. Evaluation of the usability of the observation sheet with real employees. This evaluation was performed by the employees who fill the observation sheet and provide information about undesired social transparency behaviour. Table 19 shows the questions that were attached to each observation sheet. Section 8.4.3.1 provides the results of employees' evaluation of the observation sheet.

TABLE 19: EVALUATION QUESTIONS FOR OBSERVATION SHEET

Evaluation Questions
1- How did you find the ease of completing the sheet?
2- How did you find the language used in the sheet? For example, the terms used in the questions.
3- How did you find the length of the sheet?
4- Do you find any difficulties to complete the sheet? Why?
5- How did you find the support information attached to the sheet?

2. Evaluation of the effectiveness and feasibility of the assessment method and its supporting materials. The facilitators, system analysts, and managers were recruited to evaluate the assessment method. The evaluation question of the assessment method and its supporting materials presented in Table 20.

Usability criteria	Evaluation Questions
User Impression (Understandability and Comprehensive)	1- How did you find the using of (1. The method 2. The tool)?
	2- How did you find the layout of the content (1. The method 2. The tool)?
	3- How did you find the amount of the content on (1. The method 2. The tool)?
	4- What did you like the most from the analysis tool? Why?
	5- What did you like the least from the analysis tool? Why?
Effectiveness	6- How did you find the method and the tool in answering your questions?
	7- How did you find the method and the tool in detecting risks of online social transparency?
	8- What are the benefits that you obtained from the method and the tool?
Helpfulness	9- How did you find the use of the tool in identifying the risk of online social transparency?
	10- How did you find the helpfulness of the tool in the planning of mitigation process of the identified risks?
	11- What are the analysis techniques that can be extracted from the tool?

8.4 RESULTS

This section presents the results of the two stages, (i) Expert checking and (ii) Case study evaluation.

8.4.1 STAGE ONE: EXPERT CHECKING

After familiarising the two managers (i.e., Project leader and Head of quality assurance) with the research problem, research aim and demonstrating the proposed assessment method. They were asked to review the assessment method by themselves and discuss and speak out any suggestions. Based on their knowledge of employees' requirements, there were some suggestions to improve the quality of the observation sheet to be more comfortable and easier to use by employees.

During the discussion, the project leader suggested to clearly inform the employees that the observation sheet should represent one case. The project leader commented that *"some employees may provide all their observation in one sheet"*. Therefore, adding a sentence in the **instruction** section helps in avoiding confusion and uncertainty in providing observations. The following figure of the observation sheet shows the modification in regard to this suggestion.

Instructions:

1) This sheet should represent the observation of one case.
2) Describe the information observed and identify whether it is shared or missed in the online platform
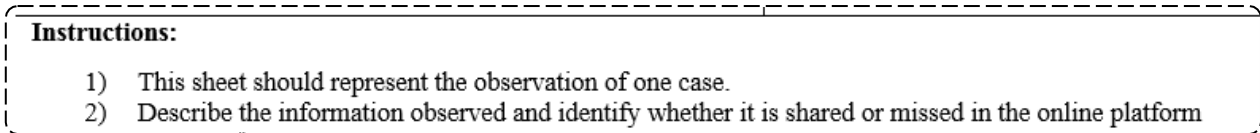
FIGURE 30: SUGGESTIONS FOR THE INSTRUCTION SECTION IN THE OBSERVATION SHEET-PART 1

Some questions in the sheet are related to another question and might be skipped in certain conditions. For example, if the answer to question A.1 (Information was revealed) is Yes, all other questions are required to be checked. In case the answer was No, then some details in section B (Time of transparency i.e., the instance and frequency of information sharing) and all questions in section C (Presentation of transparency) are not required to be answered. The participants suggested also informing the users that some questions in the sheet can be skipped in certain conditions. The following figure from the observation sheet shows that a sentence regarding this matter was added in the **instruction** section.

4) If **A1** is **Yes,** then all the sentences are needed to be checked. if it is **No**, then jump to sections **1,2,3** from **B** and all **D** and **E**
5) If one of **B1, B2** and **B3** is **Yes**, then the others are **No**
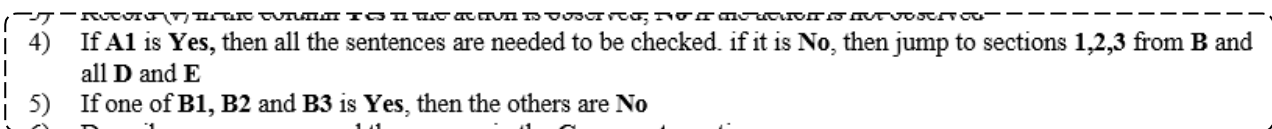
FIGURE 31: SUGGESTIONS FOR THE INSTRUCTION SECTION IN THE OBSERVATION SHEET-PART 2

As the organisational goal model is the base of the assessment method, the observation sheet designed to reflect the notions used in the goal model. Therefore, it requires information about the activities that were influenced by social transparency and the interdependencies between the sender and receiver of social transparency. The head of quality assurance has experience in collecting data from employees for quality assurance analysis. She argued that activity could also refer to any actions that can be done by the employees. She commented *"some action might be trivial and they are not included in the goal model of the organisation such as chatting with colleagues in the break time"*. Therefore, she suggested making the meaning of the activity clear for the user to avoid information about the insignificant activity. A description of the nature of the activity was added also in the **instruction** section as shown in the following figure.

> 7) Activity refers to the functionality you perform to meet organisational goal such as **tasks** you perform or **goals** you work to accomplish

FIGURE 32: SUGGESTION FOR THE INSTRUCTION SECTION IN THE OBSERVATION SHEET-PART3

Moreover, more meta-information was suggested to be involved in the **comments** section in the observation sheet. The project leader elaborated that *"employees may not be familiar with such behaviour assessment, and they may provide information that is not useful for the analysis process"*. At the first version of the observation sheet, there was a single label "Concern" used for all aspects for participants to elaborate on each criterion, without clarifying the type of information needed and its level of detail. The researcher clarified that employees will be educated well about the use of the observation sheet and they will be provided with supporting documents that describe the terms in the sheet. However, the two managers were concern that employees *"may not refer to the supporting document each time they want to report an observation"*. Therefore, it was suggested to include some meta information in a form of labels in each question (i) to clarify the type of information need to be provided, (ii) to act as a guideline for the employees and (iii) to avoid the provision of information that not serve the purpose of the assessment process. For example, one of the findings in this research shows that risks of online social transparency can stem from the format and subject of the shared information. In question A.1 (information was revealed), the researcher expected employees to provide information about the format and the subject of social transparency. Therefore, in order to avoid unnecessary information, the researcher added Meta-information in regards to the format and the subject of the information. Similarly, Section C (presentation of transparency) included more meta-information in the **comments** section to specify what kind of information the researcher need for the assessment process. The following figure of the observation sheet shows examples of the added meta information.

C. Presentation of Transparency				
1. Information is sufficient		☐ In quantity ☐ In details: ☐ In quality: Elaborate more:		
2. Information is readable/browsable		In terms of (language – written content – resolution – others): Elaborate more:		
3. Information is easy to understand		In terms of (language – written content – drawing content – others): Elaborate more:		

FIGURE 33: SUGGESTION FOR META-INFORMATION IN THE OBSERVATION SHEET-PART 4

In the first version of the observation sheet, section B (time of transparency) has six questions about the time of the transparency information, as shown in Figure 34. The managers suggested that the three last questions which are related to instance information, frequent information, and up-to-date information can be integrated into the three first questions (i.e. information before/during/after activity). They stated that the last three questions are a description of the information provided (before/during/after) the activity. Therefore, they can be integrated as meta information in order to minimise the content in the observation sheet. Figure 35 shows how these questions have been added to the **comments** section.

B. Time of Transparency		
1. Information is provided before activity		Activity: Concern:
2. Information is provided during activity		Activity: Concern:
3. Information is provided after activity		Activity: Concern:
4. Information is provided instantly		Concern:
5. Information is provided frequently		Concern:
6. Information was up to date		Concern:

FIGURE 34: SECTION B IN THE FIRST VERSION OF THE OBSERVATION SHEET

B. Time of Transparency		
1. Information is provided before activity/Goal		Activity (task/goal): Information was (instant – frequent - up to date): Elaborate more:
2. Information is provided during activity/Goal		Activity (task/goal): Information was (instant – frequent – up to date): Elaborate more:
3. Information is provided after activity/Goal		Activity (task/goal): Information was (instant – frequent – up to date): Elaborate more:

FIGURE 35: SECTION B IN THE FINAL VERSION OF THE OBSERVATION SHEET

Lastly, some questions are suggested to be represented by one question because the answer to one question leads to the other question. For example, Question D.3 and D.4 were asking if employees work in the same workplace or distributed workplace. If the answer of D.3 is No, that means they are work in a distributed workplace. Therefore, the managers stated that there is no need to have them in two separate questions. Similar suggestions were provided for Question E.1 and E.2.

As such, the suggestions and modifications were limited only to the details in the observation sheet to make it understandable and easy to use by all kind of employees and to help the researcher to obtain information that serves the purpose of the assessment process. In addition, the participants stated that, having labelled and more structured input will also facilitate the analysis process. Based on their suggestions, the supporting document that includes a description of the sheet terminology was also modified. The rest of the artefacts of the assessment method (i.e. the risk analysis tool and risk analysis techniques) had a great deal of agreement. The modified version of the observation sheet can be seen in Table 14 in section 7.4.1.2. The previous versions of the observation sheet can be found in Appendix 11.5.6.

8.4.2 STAGE TWO (PHASE ONE): ASSESSING WITHOUT THE AID OF THE PROPOSED ASSESSMENT METHOD

This phase was conducted to investigate how the assessment team, including facilitators, system analysts and enterprise management can (i) identify the risks of online social transparency in enterprise social system and (ii) prioritise the risks based on their impact on the internal stakeholders and the work environment.

Session preparation:

At the beginning of the session and in order to ensure that participants are prepared for the evaluation session, the researcher provided the participants with the following documents:

1- Educational brochure (presented in Figure 13 in chapter 7) to remind participants about the research problem.
2- List of potential risks that may occur in the work environment due to practicing online social transparency, presented in Table 13 in Chapter 7
3- List of risk factors that play a role in the occurrence of some risks, Presented in Table 12 in Chapter 7.

After introducing the previous concepts, the researcher provided the participants with some questions in order to identify the risk and risk factors of online social transparency in their workplace

based on their background and work experience on risk analysis. Some participants have a good knowledge of risk analysis in their workplace. These participants were a valued support power to other participants in this session. The participants used brainstorming and speak aloud their ideas and suggestions. The following questions were the base of the discussion in the focus group.

Q1: If you were a member of the assessment team of online social transparency in your company,

Q1.1: How would you identify the risk and risk factors of social transparency in your workplace?

Q1.2: How would you evaluate the impact of the risks on the work environment and stakeholders? for example, the impact on their goals, tasks and relationships?

Q1.3: How would you rank the risks of social transparency (i.e. based on which metrics)?

These questions represent the activities required to be performed by the assessment team in this session. The following sections discuss the results of these activities in more detail.

Activity 1: Identification of risk and risk factors

This activity aimed to investigate how the risks can be identified with traditional ways of risk identification. The researcher asked the participants to write a list of social software used in their organisations to enable the participant to recall examples from this software and to link the risks to their sources of online platforms. The main question that leads the discussion in this activity was **"How would you identify the risk and risk factors of social transparency in your workplace?".** The participants suggested some traditional techniques that may help in identifying the risks of social transparency and their factors. Table 21 presents the suggested risk identification techniques.

TABLE 21: EXAMPLES OF RISK IDENTIFICATION TECHNIQUES USED IN THE ORGANISATION

Risks Identification Techniques
1- Interview employees
2- Scenario
3- Lesson learned from previous experience
4- Questionnaire

The participants were asked to provide a list of the risk and the risk factors that may result from the practice of social transparency in their social software. Some participants suggested conducting an

interview with all employees or distributing a questionnaire because risk may differ from one person to another. However, in this session, they provided their answers based on a discussion of their previous experiences. The findings are presented in Table 22. The researcher excluded the risks that are not related to the research problem.

TABLE 22: RESULTS OF STAGE 2 (PHASE 1) - RISKS IDENTIFIED BY USING TRADITIONAL METHODS

Risk	Risk Factor (s)	Description
Information overload	Irrelevant information	Transparency of information in the general chat rooms that involve all employees. There was a consensus that information overload is the most common risk of social transparency. It was pointed out that *"lack of instructions about transparency practice in the group chat room ends up with sharing irrelevant information",* which leads to information overload.
Distracting from work	Frequent and Instant transparency	Distraction may happen due to involving in several chat rooms. Some participants who has more than one role in the organisation stated that might be a member in several chat rooms such as chat group with employees from same department or chat room for examination team. Random and frequent transparency about each employee's updates can cause distraction for other members.
Comparison	Work progress	Transparency of work progress can cause comparison with other employees. It was stated, *"unrequired and unplanned transparency of marking progress in the group chat which includes managers puts other employees under pressure to be transparent about their progress too".* This transparency may put other employees in undesired comparison with the transparent person.
Stress	Untimely transparency	One participant stated that she has been under stress because her colleague was being late to inform her that he has another task needs to be finished first before checking the task between them that should be finished soon.

Less motivation	Unreadable information	The information may not match the employee knowledge such as sharing programming code with employee who have less knowledge about programming language
Misused the information	Information accessibility	One participant stated that *"transparency in public discussion forums may make other employees use the information for their own purposes".*
Minimum commitment	Task interest	In collaborative task between course lecturer and teaching assistant such as marking, transparency of less interest to perform the task may reduce the commitment from collaborators.

<u>Activity 2:</u> Identifying and analysing the impact of the risk

This activity aimed to investigate how the participants would use their current techniques to identify the impact of social transparency risks on the internal stakeholders and work environment. The question that leaded the discussion in this activity was "**How would you evaluate the impact of the risks on the work environment and stakeholders? For example, the impact on their goals, tasks and relationships**"

During this activity, the researcher asked the participants if they think that information about stakeholders' activities and dependencies is useful for risk assessment, identifying the impact of risks and how would they utilise this information. From their perception of social transparency and its potential risks that introduced at the beginning of this session, there was a consensus on the importance of using this information in identifying the impact of the risks on the organisational members, their activities and their relationships. Some system analysts declared that they currently use techniques for conducting biannual assessment. For example, assessment for higher-level courses by mapping all college's courses to the formulated student outcomes to ensure the student outcome attainment and to identify the stakeholders who may affected by any noted risks. They stated that they currently use organisational charts that show the hierarchy and the dependency between roles to detect the roles that may affected by the identified risks. They also use narrative description to document the responsibilities of each role. Example of roles description document can be found in Appendix 11.5.4. They argue, *"they can detect the impact of the risks on the specific activity and also detect the dependencies and propagation of risks through the analysis of both documents".* However,

they argued that the currently used techniques for assessment requires time and effort to reach a decision.

It was noted in this activity that participants were struggling to find a systematic way to analyse the impact of the risks based on the organisational structure particularly the impact on the stakeholders' activities and dependencies. Some system analysts suggested extracting the risks by interviewing employees and identifying the direct actors who has reported these risks. Then linking the identified risks with those actors by using the organisational chart and tracing the roles that has dependency with the direct actors and might be affected by these risks. However, they claimed that a better encapsulated representation will help in the analysis as well as a systematic way is needed to accurately link the risk with the actor's activities and identify the actors who may affected by this risk. The discussion in this activity highlighted some barriers that prevent participants from identifying and prioritising the risks of online social transparency in their work environment adequately. These barriers discussed in the following points.

1- Lack of conceptual clarity

It was stated during the discussion that risk identification techniques used in their enterprise are designed to detect risks in specific problems such as problems related to the quality of the teaching courses, course progress, course exams and student withdrawal from certain courses. These risks identification and risks assessment are designed using well-described conceptual frameworks. However, the participants illustrated that risk identification for behavioural problems is not a well-known process in most of the organisations. Therefore, the understanding of central concepts such as risks, risk factors, vulnerability, and checking points varies substantially between employees, departments and companies.

2- Difficulties in collecting the data

One of the issues that declared in the session is the difficulty in collecting data related to the risks of social transparency. This difficulty explained in the following two points:

- The first point relates to the difficulty of collecting data in large-scale organisations. The participants were able to extract some data from their colleagues in the session, but some system analysts stated that the process will be complicated if it is applied in the whole company. Thus, to waive such a problem there is a need for more dedicated and experienced roles with well-defined tasks to do the data collection process.

- The second point relates to the unstructured manner of gathering the data. Participants stated that the traditional risk identification techniques might not be applicable to gather behavioural information in large companies. These techniques provide a large number of unstructured data that need to be revised and presented in a formal structure to facilitate the analysis process. This disorganised method makes it difficult for analysts to constantly obtain meaningful data that can accurately yield good analysis results that can support managers in their decisions. Also, from an employee's point of view, there are no guidelines to help them provide the information. One of the system analysts declared that identification techniques suggested earlier in Table 21 for gathering risk data can be complicated, time-consuming and unstructured, and implementing them in large companies may fail to introduce robust and reliable results.

3- Difficulties in interpreting the data

One of the obstacles noted by observing the participants in this session was the description and interpretation of the collected data. The participants claimed that there is a lack of procedure for transforming the raw data into structured and useful information used to enable more effective decision-making. They argue that a lack of structured representation of the results may *"discourage the decision-makers from adopting the assessment method of social transparency"*.

4- Difficulties in identifying reliable and accurate risks

Risk identification in this phase relied on the participants' prediction and their personal experiences in the consequences of social transparency. It was argued that the identified risks might be unreliable and do not reflect real situations. Some participants stated that the assessment method might not be effective due to the unreliability of the identified risk factors. They agree to the need for identification techniques that extract reliable and accurate risks from real situations.

5- Difficulties in linking risks to models of organisational structure

It was noticeable that the participant has difficulties in analysing the impact of the risks based on models of organisational structure such as organisational charts and roles description. There were some attempts to link the risks to the activities and the dependencies between the actors, but these attempts can be complex and requires time and effort due to the unstructured format of the collected data. Therefore, the participants need a procedure that enables them to analyse the impact of the risk and link it to the organisational model.

6- Lack of technical capacity

It was stated that the process of collecting data from employees (i.e. by using interviews) in large companies might generate a wide range of big data records. The system analysts who participate in this study have no knowledge about assessing social behaviour in the work environment. Therefore, they stated that their company lack qualified analysts in such kind of problems. Some participants suggested contracting with experts in organisational behaviour for this purpose. However, it was argued that there are a few possibilities to apply this suggestion in some companies, due to the cost of time and money to contract with experts.

8.4.3 STAGE TWO (PHASE TWO): ASSESSING WITH THE AID OF THE PROPOSED ASSESSMENT METHOD

This thesis proposed a comprehensive, staged method to assess online social transparency in enterprise. This phase aims to evaluate the use of the proposed assessment method to identify and assess the risk of online social transparency in the social software used in the enterprise. This phase involved two evaluation studies: (i) evaluation of the observation sheet and (ii) evaluation of the assessment method and the supporting tool and techniques. These two studies were conducted on different days in order to minimise the fatigue effect.

8.4.3.1 EVALUATION OF THE OBSERVATION SHEET

As preparation for this study, facilitators were trained in how to use and fill the observation sheet. Each facilitator was responsible for training a group of employees who are willing to participate in the study. The facilitators also were a reference for those employees when they need clarification about some parts of the sheet. The employees were given 10 days to provide their observations. An open-end survey was attached to the observation sheet to enable the participants to evaluate the usability of the sheet based on the context of the observation. Employees could provide more than one observation. A total of 17 observations collected from the employees. Some employees evaluated the sheet when they completed the task, while some of them evaluate it every time they fill the sheet. The evaluation sheet was evaluated in terms of the ease of use, the length of the sheet, the language used and the helpfulness of the supporting documents. In some cases, the researcher had to back to some participants to clarify some of their answers. The results listed as positive and negative feedback from the users. The following subsections represent the analysis of this evaluation study.

- **The Ease of use**

One of the questions in the survey was about **the ease of completing the sheet**. This question aimed to evaluate the design of the sheet and to explore how easy the sheet to be used by its intended users.

Participants' opinions vary between positive and negative impressions about the use of the sheet. In general, majority of them stated that the sheet was clear and easy to use.

There was a general positive agreement that the sheet was well structured, which enhance the usability of the sheet. The detailed structure and supporting key terms (labels) of the sheet was the advantage that helps the employee to complete the sheet. It was stated that the instruction section in the sheet was helpful for users to fill the sheet effectively. A participant described this section as *"a reference for the users"*. Involving this section in the observation sheet enables the users to remember the steps and conditions when it is needed.

Moreover, it was commented that the integration of some details (meta-information) in the sheet helps the users to avoid confusion and uncertainty while providing answers. The questions of the sheets are designed to represent one point. The participants described the questions as *"straightforward questions"* that enable them to provide their answers easily. However, some participants commented that the sheet is missing a summary of the research problem and the purpose of the sheet which makes employees return to the facilitators to clarify some cases that may not fit with what the researcher need. Another comment was about the redundancy in the meta-information section for different questions. One participant suggested merging the repeated meta-information in one section and filling them based on the answered question. For example, in section B (Time of transparency), the meta-information for the three questions are the same, thus making the one shared section of meta-information between the three questions. Figure 36 shows an example of how the merging of meta-information should be done.

FIGURE 36: MERGING META-INFORMATION OF THREE QUESTIONS

- **The language used**

The evaluation of the observation sheet involves a question to evaluate the language used in the sheet. The language in this question refers to the written language (i.e., English), the simplicity level of used terms and the formulation of the written sentences.

Based on the analysis of the participants' results and the discussion with the facilitators about the language of the sheet, the sheet was written in understandable language. The participants were from different roles, skills and level of experience. They stated that the sheet was written in simple language that can be understandable to all employees. However, some participants had to return to the definitions document of the sheet to ensure some terms, especially questions A.3 (Information accessibility), C.4 (recipient's requirements), and E.1 (Equal transparency). These terms used in these questions (i.e., accessibility, recipient requirements and symmetrical transparency) are understandable in the meaning but they include several aspects. For example, accessibility in this research means accessibility from several online platforms and accessibility by different employees. One participant suggested that if there is an electronic version of the sheet, it would be better to have a caption in front of each question to describe what each question means and what does the researcher expects. During the training session with the facilitators, it was noted that the participants conflicted about the meaning of observer and observee at the beginning of the sheet. Although these two terms were described in the definitions document, some facilitators and employees found difficulties in identifying the role of observer and observee. They suggested that the sheet needs to include a sentence to clarify that the observer presents the person who will fill this sheet and observee presents the socially transparent person.

- **The length of the sheet**

Collecting the data in the proposed assessment method was based on the voluntary participatory approach from organisational members. Therefore, one of the criteria that was important to the researcher is designing an observation sheet that is acceptable and does not require a long time to be filled. The researcher was careful to design a sheet that does not require more writing and description from the employees. Based on the participant answers, the length of the sheet was measured based on the time spent in filling the sheet.

The participants agreed that the length of the sheet was not too long that motivate the employees to participate in this study. Some participants stated that *"The first time was the longest time to complete the sheet"* due to the unfamiliarity with the terms and questions at the first time. As a result of the learning effect, it was commented that the employee spent less time in filling the second observation than the previous one. It was illustrated that the employee became familiar with the concepts and the requirements of the sheet. Moreover, the inclusion of some details in the question (i.e., meta- information) helps employees not to spend a long time thinking about the answers. However, it was suggested to provide a list of options that enable employees to choose from them. For example, a list of online platforms and their features, a list of potential risks that can be seen as expected risks in all work environments such as stress, pressure, loss of motivation and loss of

Page | 201

collaboration. These lists of options may be integrated into the electronic version of the observation sheet to accelerate the process by enabling employees to choose from a pre-defined list of risks.

- **The helpfulness of supporting documents**

The observation sheet was attached with a document that can be used as a reference if the participants face difficulties in understanding the meaning of some terms in the observation sheet. The document was structured as a glossary that contains definitions of all terms in the sheet and provides descriptions and examples of these terms.

The definition document attached to the observation sheet was described as helpful and useful in guiding the participants while providing their observations. It was stated that *"the structure of the document is divided based on the sections of the observation sheet which enable the users to find the intended section easily"*. However, some employees were confused when they review the document for the first time (i.e., the examples of risks). It was commented that the document was missing a summary at the beginning to inform participants not to stick with the cases provided in the examples and these cases do not present all the cases that cover in the research. The description of the sections was general and did not provide a specific description for the meta-information in each section. Some employees found difficulties in determining how to provide information in some of the meta-information such as meta information in section C.1 (Information sufficiency) in the observation sheet. Moreover, it was suggested to add a description for the last part of the observation sheet to clarify what it means by action needed and issue resolved.

8.4.3.2 *EVALUATION OF THE ASSESSMENT METHOD, RISK ANALYSIS TOOL, AND TECHNIQUES*

This session involved two activities: (i) risk assessment without the aid of the tool and (ii) risk assessment with the aid of the tool. This session lasted four hours.

The participants were the same as in the first stage (facilitators, system analysts, and managers) and they are familiar with the purpose of the session. This session aims to validate the assessment method and the supporting materials (i.e., the risk analysis tool and goal-based risk analysis techniques) to identify and assess social transparency risks. This session started by assigning a facilitator who will be responsible for steering the discussion. The researcher plays the role of participant as observer.

Activity1: Risk assessment without the aid of the tool and goal-based risk analysis techniques

   In this activity, participants were asked to use the data collected from the employees by observation sheet to (i) identify the risks and risk factors and (ii) assess the impact of the identified risks based on the organisational goal model.

   As preparation for this activity, a goal model was built for their workplace, as presented in Figure 29. Then, the participants were given a list of questions to guide the discussion during the session. These questions are:

1. What are the risks that have been identified?
2. What are the risks that related to certain category, e.g., social information, technical information, goal/task-based information, role-based information and resources based information or presentation of transparency?
3. What are the risks that occurred as a result of sharing technical information amongst employees who work in the same workplace?
4. What are the risk factors that need more attention from the decision-makers?
5. Who are the employees that may be influenced by the occurrence of certain risks?
6. Rank the identified risks based on their impacts on the work environment
7. Create risk analysis techniques such as cause and effect.

The activity started by reviewing and reading the observation sheets to familiarise themselves with the information. The participants suggested starting of thinking for a way to present the important information in the sheet in a well-structured report. Based on their experience on risk analysis, the participants suggested organising the information in a tabular format to present the identified risks, their factors, the used platforms, the person affected by the identified risk and how many required actions to solve the problem. Table 23 presents examples of the risks identified by the participants; more examples are in Appendix 11.5.10.

   As a second activity in this session, the participants were asked to assess the impact of the identified risks based on the organisational goal model. The participants suggested adding some fields in the previous table to link the identified risk with the organisational goal model. These fields represent the goal/ task affected by the risk, employees who depend on these goals/tasks and the concern level of the identified risks (i.e., high, medium or low). The following points present the results of the discussion in this session.

- The assessment method provided useful steps to collect the data and identify the risks. However, the method may cost time and effort to present the information in the previous table for a large number of observations.

- System analysts in this session are familiar with the concept of risk analysis and risk assessment. However, they struggled to analyse adequately the impact of the risk based on the organisational model. The observation sheet helped them to link the identified risk to organisational activities, but they need more criteria to rank the risks based on their impact.

- The same risks may occur with different risk factors. In the first activity, it was noted that employees might suffer from the same risks but from different sources. For example, it was diagnosed risks such as less motivation and pressure in more than one employee but each one with different causes. Less motivation was reported to result from transparency of irrelevant information about collaborative task as well as too late transparency of technical relevant information. Some participants suggested that the presentation of the risks in the table should be based on the categorisation of the information types rather than the individual level, as presented in Table 23. It was also suggested to create a two-dimensional table to present a general view of the identified risk and their factors. Table 24 depicted the format of the two-dimensional table.

Identified Risk	Information type	Risk factor (s)	Online platform	Affected employee	action needed	Suggested actions	Quote	Concern Level
1. Missing activity	Social	1. Lack of transparency 2. Information provided after activity 3. both employees located in the same workplace	WhatsApp	Office director	No	Provide clear answers	Director of Dean office reported, *"due to bad weather, the AAST president decided that only 10% of the staff present. The dean of CCIT was not transparent about who he needed to be present at the college. So I thought I am not going to be included in the 10% who can present. Accordingly, I missed the college board meeting"*	
2. Pressure	Technical	1. lack of transparency 2. Information was not provided before activity 3. the observer depend on the observee to perform the task 4. No equal transparency between them	Email	Teaching assistant	Yes	Transparency of the used software	Teaching assistant reported that " *I was asked to perform a task by my manager and he didn't provide me with all needed information from the beginning"*	
3. Goals conflict	Goal-based information	1. Lack of transparency about the goal	WhatsApp	Call centre staff	No	Clarity of ranking and	A member of call centre team reported that *"The information of a*	High

		2. Information not provided after goal achieved 3. Observer depends on observee to achieve goal 4. Both collaborate in the same goal 5. Both located in the same workplace 6. No equal transparency between them				rewards from the management	*goal was hidden by the observe to achieve and rank higher than his colleague"*	
4. Delay in progress	Goal/Task	1. Revealed text information 2. information is relevant 3. information is accessible to all employees 4. Information instantly before activity 5. Both employees collaborate in the task 6. both employees located in the same workplace	E-mail	Manager	No	none	Head of quality assurance reported that *"I usually send an email as a reminder to all course lecturer who still didn't provide their course line and I also CC the college dean in these emails. They can see in the email recipient list who did not submit the template too "*	Medium

TABLE 24: TWO-DIMENSIONAL TABULAR FORMAT FOR PRESENTING THE RISKS FACTORS

	Information availability	Information accessibility	Information relevance	Information provided before activity	Information provided during activity	Information provided after activity	Information was sufficient	Factor N
Missing activity	No					Yes		
Pressure	No					Yes		
Delay in progress	Yes	Yes	Yes	No	Yes	No	Yes	
Stress	Yes	Yes	No				No	

- In the second activity, it was observed that the participants were struggling to assess the impact of the identified risks. Some participants suggested providing the total number of employees for each concern level (i.e., high, medium or low) and the risks associated with each level, as presented in Table 25. Three observations have been provided without determining the concern level of the reported risk. A manager (i.e., head of quality assurance) stated that *"the concern level in the observation sheet represents individual concern but not necessary have a significant impact on the organisation"*. Therefore, the concern level cannot be considered an accurate measure of the risk impact.

TABLE 25: RISK IMPACT BASED ON INDIVIDUAL CONCERN LEVEL

Concern Level	Identified risks	Number of employees/ concern level
High	Task Quitting Delay in progress Stress Goals conflict Loss of motivation Loss of performance	8
Medium	Delay in progress Comparison Information misuse	3
Low	Delay in progress Information overload Loss of Interest	3

- In regard to risk assessment based on the organisational goal model. This activity focus on linking the identified risks with the organisational tasks/ goal and employee dependencies to determine the real impact of the risks on the work environment. Some participants argued that the

assessment method lacks a full description of its activities i.e. details in how to identify the risks and assess the impact of their occurrence.

- Although the participants were struggling in the assessment activity, there were several suggestions on how to assess the risk based on the goal model. System analysts suggested to follow the previous structure (i.e. tabular format) to present the following information:
  - ➢ The identified risk, to be taken from Table 23
  - ➢ The activity/ goal associated with this risk,
  - ➢ The employee who performs this activity/ goal,
  - ➢ The employees who have a dependency on this activity/ goal

  While some participants suggested augmenting the goal model with symbols that present the risk and their severity based on the role level, they argued that the visual presentation of the goal model and risks would help the decision-makers to view the dependencies within the actor's boundaries and dependencies from other actors. However, system analysts declared that the difficulties in ranking the risk resulted from the absence of valid criteria for the severity of risks in organisational context. Some analysts suggested ranking them based on the number of activities associated with each risk and the number of dependencies on these activities.

- Participants agree to the significance of the assessment method of online social transparency. However, the manual approach of the assessment method faced rejection from the system analysts and managers due to its complexity and unclarity in identifying and assessing the risk of social transparency. It was commented, "*this process costs more than what it benefits*".
- The assessment method should provide answers for the assessment team inquires. It was noted that this assessment method could be applicable to provide answers for simple inquires only, such as what the kinds of risk occurred in the work environment or who are influenced by the occurrence of certain risks. Complex enquiries that involve several questioning factors could not easily be answered by the manual application of this approach such as what are the risk factors for the pressure that may occur amongst employees who work in the same project.

Activity 2: Risk assessment with the aid of the tool and goal-based risk analysis techniques

The second activity of this phase aims to identify and assess the risk of online social transparency with the aid of the proposed risk analysis tool and goal-based risk analysis techniques, described in section 7.4.2.2. As preparation for this session, the researcher spent 15 minutes explaining the risk analysis tool and goal-based analysis techniques. To save time and reduce the overload of exercises in this session, the researcher enters the data collected from the observation sheets to the risk analysis

tool manually. The participants were asked to try to answer the previous questions by using the risk analysis tool.

Before starting the evaluation, systems analysts highlighted some concerns:

- The system analysts were concerned about the reliability of the results. The risk analysis tool required the total number of employees in the department, college or organisation. The tool can be utilised for assessment on a scale of a certain department or college where there is lots of information sharing via online platforms. Moreover, the principle of the assessment method was based on the voluntary participation from employees to provide their observations. Therefore, the results might not reflect the real context of online social transparency because the data were not collected from all members in the department or college.

- The assessment method was designed to enable employees to provide more than one observation. The collected observations were a paper-based and they are entered in the tool manually. System analysts argued that the manual feeding of the collected data into the tool might not be applicable to enter a large number of observations from a large number of employees. The researcher commented that the tool will be implemented as a two-sides software to be uploaded in employees' PCs where each employees, admin and analyst can access to customised pages. Employees will have access to employees' page in the tool and they will be able to fill in the observation sheet (in an electronic form or webpage) and submit to the system. Then, the admin or analyst can access to the analysis page where they should be notified with all the uploaded sheets, confirm receipt and, add the content of the sheets automatically for analysis. The participants advocated that the automated version of the tool is better than collecting a large number of observations manually, which also require the analysts to enter this information into the tool manually.

- Although the instruction section of the observation sheet reveals that the sheet should present one case. It was noted that some employees provide different risks in one observation sheet. The analysts suggested explicitly informing the participants that the observation sheet should involve one risk.

The participants were asked to use the tool in order to assess the risks identified from the observation sheets. The following points present the results of the analysis in this activity.

- As a general observation, the risk analysis tool supports the clarity and effectiveness of the assessment method. The participants agreed that the tool provides the results in a well-

structured format that help decision-makers to understand trends and derive insights through minimising the effort to search for the data needed for making sound decisions.

- The assessment method was based on the participatory approach of employees, system analysts, and management. Engaging employees in the assessment method support the validity and effectiveness of the decision-making process. System analysts emphasised that the participatory approach help in saving time and effort to investigate the impact of the identified risks with the employees.

- There was a consensus on the usefulness of providing graphical and numerical information in the tool such as presenting the number of observations, the participation rate and the communication rate amongst employees. Figure 37 shows a screenshot of the numerical and graphical information in the tool. They advocate the need for such numerical results to help decision-makers to understand the context of social transparency in the organisation. However, they suggested providing a standard metrics for social behaviour to indicate the level of problematic social transparency. For example, if the total number of observers who reported concerns related to social transparency is over the half of the total number of employees, then this number can be seen as an indicator of problematic social transparency. It was stated that *"the numbers in the tool do not inform if a certain level of participation rate means there is a problem in the practice of social transparency"*. However, these standard metrics might need

FIGURE 37: SCREENSHOT OF NUMERICAL AND GRAPHICAL INFORMATION IN THE TOOL

further theoretical research on social behaviour to identify the level of problematic social transparency.

The graphical presentation of the results was helpful in quickly understand the trends and invite further exploration of the practice of online social transparency. A participant stated that *"using charts facilitates the understanding of the relationships between data more than using the tabular presentation"*. It was also stated that the graphical presentation of the results help the analysts to detect the sources of the problem and the areas that need more consideration quickly.

- The tool was designed as an interactive dashboard to enable the participants to identify the risks and their factors in a short time compared with the previous activity. However, based on the participant observation, the tool provides a list of the observed risks without consideration to the risk categorisation. These categorisations were indicated in the observation sheet to enable the employees to link their risks with one of them. A participant from the management suggested displaying the risks based on their categorisation (i.e. wellbeing, performance, workplace environment).

- The tool was designed based on the filtering techniques to enable the users to dedicate the results based on their inquiries, as seen in Figure 38. There was a general agreement that the filtering technique was the most liked feature in the tool. It was declared that this feature enables the user to run several kinds of inquiries with different complexity levels. One participant stated that *"the ability to filter the results based on a combination of different inquires facilitates the decision-making process and shows the users the trends for very complex inquires"*.
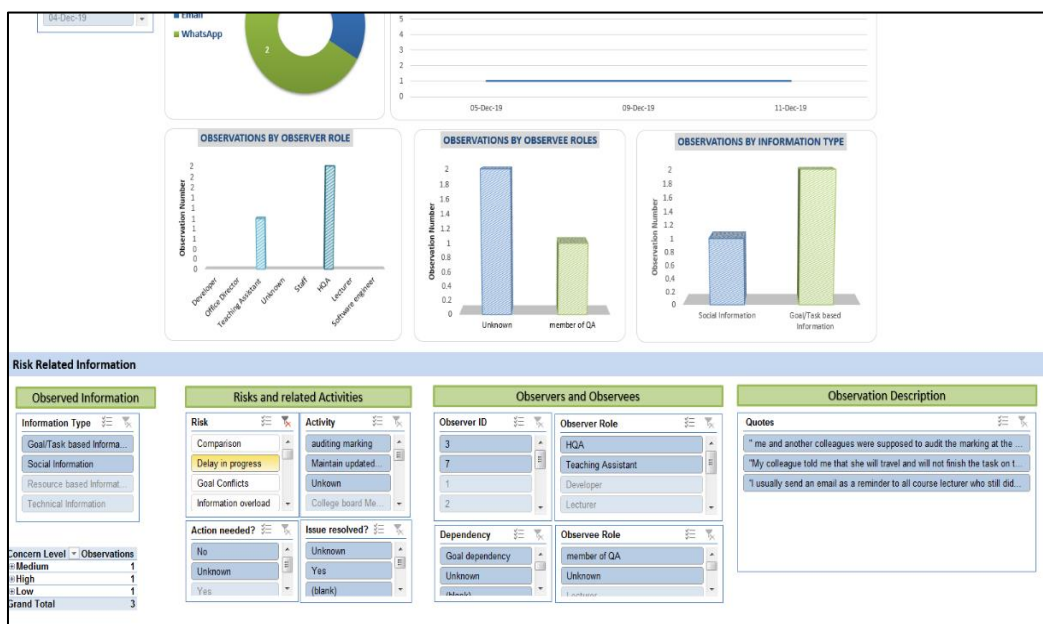
FIGURE 38: SCREENSHOT OF THE FILTERING TECHNIQUE IN THE TOOL

- For the completeness of the tool, a participant from the management recommended providing a template for the report that can be filled by using the tool or it can be generated automatically in the tool. He suggested upgrading the tool from displaying abstract results into providing complex results designated based on the decision-maker demands, for example, creating a report of the high risks of sharing goal/ task-based information via WhatsApp and the reasons for these risks.

- Regarding the link of the assessment method with the organisational model, there was a concern in how the organisational activity will be presented in the tool. The organisational activities and goals were taken from the observation sheet. However, it was noted from the first activity that some employees failed to provide their activities in their observation sheet. Therefore, it was suggested to involve the organisational model in the automatic version of the observation sheet and emphasise for the employees to choose the activity or the goal associated with their risks.

- The tool displays a list of the activities that collected from the observation sheets. It was described in section 7.4.2.2, that the activity can be referred to a task or a goal in the organisational goal model. It was suggested to separate the task and the goal in two different lists, which help the users to be more precise about the activity level.

- The tool was helpful in creating different analysis diagrams. The participants declared that the tool facilitates the building of cause and effect diagram, which is a significant diagram to understand the risk and their factors. It was also stated that *"by using the tool, system analysts can build different diagrams that help them in making decisions"*.

- The participants learned about the Pareto chart and the advantages of this chart in understanding the sources of the problems. For the usefulness of the tool, it was suggested to make the Pareto chart adjustable with the filtering technique in the tool. So, the users can easily see the sources of certain problems. Figure 39 shows Pareto chart in the tool.
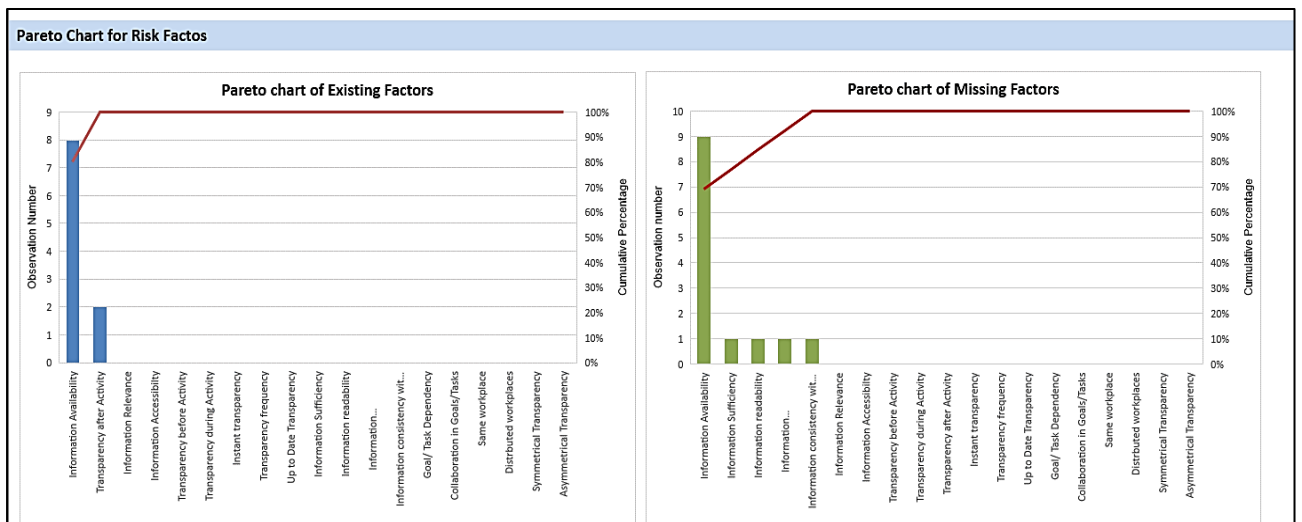
FIGURE 39: SCREENSHOT OF PARETO CHART IN THE TOOL

- **Illustrative Example:**

After identifying the risk and risk factors by using the risks analysis tool, the participants were asked to assess the impact of the identified risks by using the organisational goal model alongside the use of the risk analysis tool. There are two goal-based risk analysis techniques were designed to assess the impact of the risk: (i) goal-based risk ranking and (ii) goal-based risk stakeholders' wheel. These two techniques were described in section 7.4.2.2. The participants were provided with a written description of the analysis techniques to facilitate the assessment activity.

In the goal-based risk ranking technique, the participant started a discussion to determine which risk they should start with. Participants from management suggested starting with the risks that have a large number of high concern level because this represents the feeling of the majority of the employees. The participants used the filtering feature in the tool to determine the risk with a high concern level. They perform two filtering actions. They use the first filtering action to produce the risk with the highest concern level and a list of activities related to this risk. Then they used the filtering again to determine the activity with the highest concern level from the list of activities introduced before.

Following the steps of the goal-based risk ranking technique, participants chose **stress** that was reported by the teaching assistant (TA) in the activity named "Project discussion". By using the risk severity criteria described in Table 16 and goal model in Figure 29, the severity of stress was

Page | 214

categorised as **high** because project discussion which is related to **assignment** activity has no alternatives and it is part of AND decomposition and the course lecturer depends on the TA to perform this activity and provide the marks. **Information misuse** is a risk reported by a course lecturer in the activity named **prepare course lectures**. This risk was categorised as **catastrophic** because this task has no alternatives and it is part of AND decomposition and it has positive contribution on the soft-goal (cover planned outline) and the students depend on the lecturers to provide the lectures. The same steps have been done on the other identified risks. It was noted that some participants do not explicitly reveal the activity that reported in the observation sheet and they appear as a **blank** in the risk analysis tool. Therefore, system analysts suggested adding them in the matrix as an unrevealed activity to be left for further investigation with the observer (i.e., the person who reported this risk). Some risks have been rejected due to its irrelevant nature to the research problem. Table 26 presents part of the risk-ranking matrix generated in this session.

TABLE 26: RISK RANKING MATRIX GENERATED IN THE EVALUATION STUDY

	Project Discussion (Task)	College board meeting (Task)	Presenting Lectures (Task)	Maintain an updated version of course outline (Task)	Unrevealed Activity
Stress	High				
Loss motivation					
Delay in progress				High	Unknown
Information Misuse			Catastrophic		
Missing activity		High			
Pressure					Unknown

In the goal-based risk stakeholders' wheel, the participants followed the steps of the method to identify the direct and indirect stakeholders that may influence by the occurrence of this risk as described in section 7.4.2.2. For example, the participants suggest to started with **Delay in progress** that occurs in the activity "**Maintain an updated version of course outline**" because this activity is important in their organisation for quality assurance purposes. This activity is part of the head of the quality assurance goal's model (HQA). This role classified as the first stakeholder influenced by this

risk. Then they track the roles that have a direct dependency with HQA and the roles that also has a dependency on those direct dependers. Figure 40 shows an example of the goal-based risk stakeholder wheel generated in this activity.
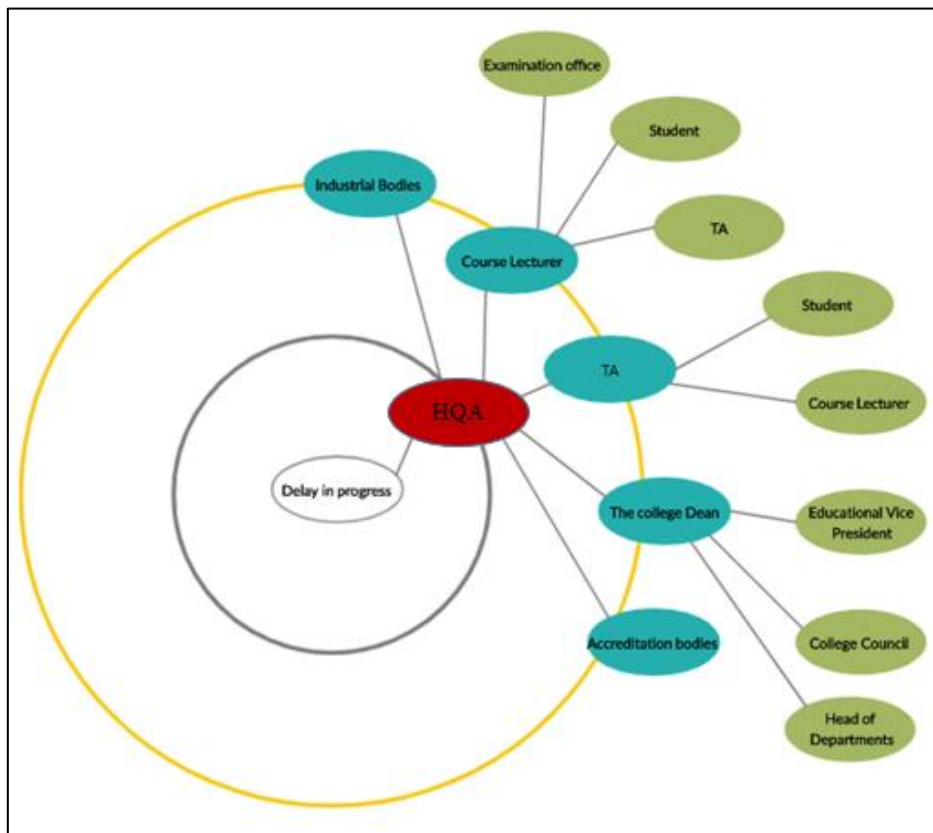
FIGURE 40: GOAL-BASED RISK STAKEHOLDERS WHEEL GENERATED IN THE EVALUATION STUDY

The discussion in this activity raised some points that are considered necessary for the efficiency and helpfulness of the goal-based risk analysis techniques. The following point summarises the results of the valuable discussion in this activity.

- It was agreed that the way of linking these analysis techniques with the goal model is novel in the risk analysis process. Some system analysts have a good knowledge of these techniques due to the nature of their work in risk assessment. They advocated the importance of linking risk analysis techniques with the organisational model to examine clearly the potential impact of the risks on the organisational activities.

- In the risk ranking technique. It was noted that participants spent a long time deciding which risk they should start with. The description of the techniques is missing clear criteria of the risk that should be assessed first. These criteria were left to the assessment team to decide the risk priority based on their impact on the work environment. As mentioned before, the participants used to

filters, started first with determining the risk that has a large number of employees with a high concern level. Then they browsed the activities that influenced by this risk and from these activities they also determine the activity that also has a large number of employees with high concern levels. The participants admitted that the risk analysis tool accelerates the time and effort to determine the risk and the activity.

- It was clearly noticed that the participants had become familiar with the risk analysis tool. This activity shows the usefulness of having such a tool in the risk analysis process. A system analyst stated that the assessment method could be overwhelming if it implemented manually, especially with a large number of observations.

- The goal-based techniques were designed to be implemented manually and based on the discussion amongst the assessment team. The discussion during the implementation of these techniques shows the usefulness of the participatory approach in supporting the decision about assessing the risk impact. The engagement of employees from various roles in the assessment method accelerates the discussion regarding the value of specific activity and dependency from other roles. Participant from the management stressed the importance of engaging various roles in the planning stage for the mitigation process. It was stated that *"having employees in the assessment process accelerates the determination of risk stakeholder even if we have the tool"*.

- In the risk ranking technique, the columns represent the activities reported by employees in the observation sheet. However, the activity may refer to task or goal as described in section 7.4.2.2. Participants suggested two ways in solving the clarity of this matrix: (i) adding the type of activity in brackets after writing the name as seen in Table 26 or (ii) creating two separate matrixes, one for tasks and one for goals. It was argued that organisation usually concern about achieving a strategic goal, then creating two matrixes provide a clear insight into the individual goals that may adhere to the achievement of the organisational goal. It was also suggested to determine the level of the task or the goal in the employees' goal model. For example, determining the parent-child hierarchies for the goals or the tasks, i.e. a parent goal that has several child tasks. They declared that awareness of such hierarchies could help in planning for mitigating the risks that appear on parent goal/task which also mitigate the risks that might affect a number of important child tasks or goals.

- It was discussed earlier that the risk analysis tool should present the goals and the tasks in two different lists. As a result of missing this feature in the tool, the participants used the goal model to determine the nature of the activity. Some employees failed to describe their activities clearly, which cost the assessment team an amount of time to decide the nature and the name of the activity. For example, teaching assistant reported that transparency of loss of interest in

performing the collaborative task due to travelling circumstances had affected the motivation of other collaborators to complete the task. The teaching assistant has not explicitly provided which collaborative task was reported in this observation. However, with the help of the employees who were in the assessment team, they were able to identify the task name.

- Some points were essential to increase the efficiency of the goal-based risk analysis techniques. It was suggested to add weight in the goal-based risk stakeholders' wheel to identify the impact on the work environment. The stakeholders present a role that may be played by more than one person. It was emphasised that adding the number of people who play specific roles may help understand the impact of the identified risks. Figure 41 shows an illustrative example of how the weights will be added in the goal-based risk stakeholder wheel.
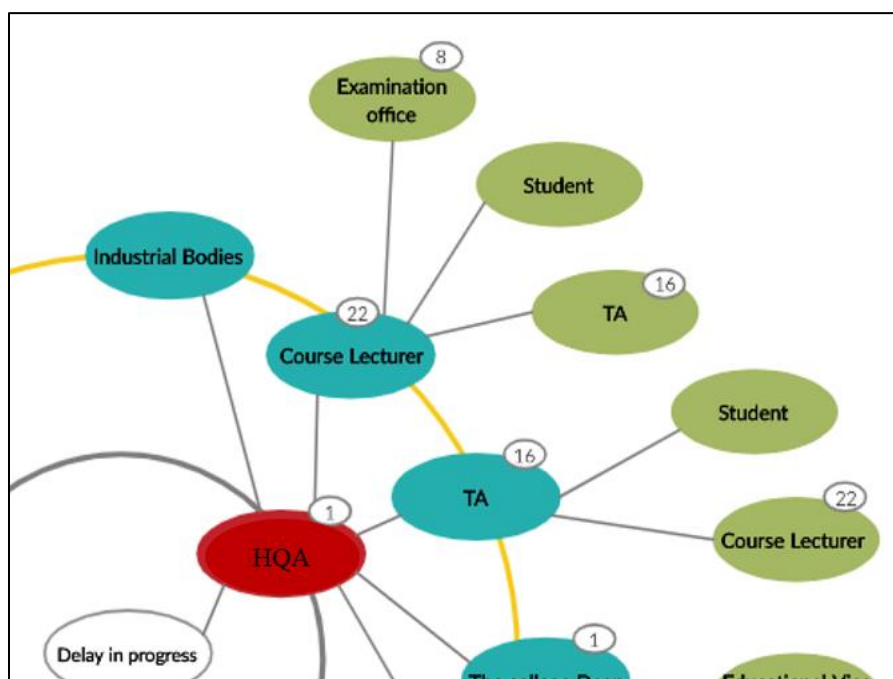
FIGURE 41: WEIGHTED RISK STAKEHOLDERS DIAGRAM

- A system analyst declared that the success of these techniques is rely on the quality of the information provided in the observation sheet. It was stated that *"the technique would work well if the employees explicitly provide a full description of their roles, the activities and stick with one risk per observation sheet"*. The integration of some conditions in the observation sheet will help the employees to provide valuable information that facilitates the assessment process.
- There was a consensus on the usefulness of the risk analysis tool in saving the time and effort in making decisions. However, they mentioned that the tool is useful to analyse a large number of observations that are provided voluntarily from employees. Due to the voluntary provision of the information, they were concern about the possibility of gathering limited amount of information

about the risks and risk factors. They argued that the use of the tool could be worthless if the number of observations is less than expected or it can be done manually.

<u>Further Evaluation:</u>

The evaluation study was conducted to evaluate the usability of the assessment method and its supporting materials, as stated in Section 8.1. The researcher noted that the participants have not provided detailed comments regarding the functionalities of the risk analysis tool. Therefore, the risk analysis tool was evaluated with three participants from software consulting company, which work in building solutions to handle big data. The mission of this company is to simplify data analytics for all users, tools and organisations. They provided services for all data, for fast search, sharing and analytics for IT, data engineers, developers, analysts, business professional and data scientist.

At the beginning of the session, the researcher introduced the aim of the study, the concept of online social transparency and its negative consequences and the aim of designing risk analysis tool for assessing social transparency. The researcher also described the functionalities of the tool and the expected outcomes. The induction session held for 20 minutes. Then, the researcher started this session by providing some observations about the participants' interaction with the tool in the second stage (phase 2) such as struggling in interpreting risk factors, scrolling a lot through the page navigation and asking about some results that display in the tool. In this session, participants followed think-aloud techniques to discuss the usability of the tool and suggested some amendments that improve the usability of the tool. The following points summarised the results of this session.

- It was generally agreed that the tool designed in simple way that enhance the learnability aspect of software. Learnability refers to "the ease with which new users may accomplish certain tasks" (Lindgaard 1994). A participant declared that "one of the problems that may face organisations when applying new software is the increased training, outsourcing and highly maintenance costs. The participant positively commented that the clarity and simplicity of the tool could support the learnability for new users.

- The tool represents an interactive dashboard that divided into five sections to organise the result into consistent groups. It was declared that the tool is missing a descriptive caption that identifies the purpose of each section in the tool. The participants suggested enhancing the usability of the tool by adding a description of the charts and the numerical analysis, especially the Pareto chart section.

- In regard to the filtering feature of the tool, participants had a problem in understanding how the data was filtered and what are the outcomes of the filtering task. The tool shows the filtered data

as active cells while the excluded data as inactive cells. However, they were concern about the ability of random users to understand the filtering task. Therefore, one of them suggested removing the excluded data from the list and just showing the required data.

- The visibility of the chart and diagrams in the tool refers to the extent an image, text or diagram is noticed or attended to (Li et al. 2012). A participant argued that the number of charts in one single window is slightly higher which cause lots of scrolling in the screen. In addition, the increased number of charts and tables on one page might hinder the seamlessness of reading the results and perception of the trends and changes. He suggested involving different windows in the tool to present more results and visual presentations.

- It was noted in the previous session that the participants were struggling to interpret the risk factors and link it to the identified risks. The risk factors were presented in the form of adjustable numerical information, as shown in Figure 42. It was commented that the risk factors could be presented in a better layout that enables a better view of the results. A software engineer suggested displaying the risk factors in an adjustable bar chart format instead of numerical format. This adjustable format could help the users to see precisely the factors that related to each risk and easily recognised the significant risk factors.

Risk Factors Information

Content related Factors		Timeliness related Factors		Presentation related Factors		Relationship related Factors		Sharing Practice related Factors	
Availability	Observations	Transparency Before Acti	Observations	sufficient Information	Observations	Work dependency	Observations	Symmetrical Transparency	Observations
No	9	No	1	No	3	No	4	No	8
Yes	8	Yes	2	Yes	2	Yes	11	Yes	1
Relevance	Observations	Transparency during Acti	Observations	Information Readability	Observations	Work Collaboration	Observations		
No	2	Yes	5	No	1	Yes	10		
Yes	6			Yes	2	No	2		
Accessibilty	Observations	Transparency after Activit	Observations	Information Understandability	Observations	Shared Workplace	Observations		
No	2	No	3	No	1	Yes	12		
Yes	5	Yes	8	Yes	4	No	2		
		Instant Transparency	Observations	Consistency with peer requirements	Observations				
		Yes	2	No	3				
				Yes	1				
		Frequent Transparency	Observations						
		Yes	2						
		Up to Date Transparency	Observations						
		Yes	1						

FIGURE 42: SCREENSHOT OF THE NUMERICAL INFORMATION OF RISK FACTORS IN THE TOOL

- It was argued that the charts present simple results. Therefore, it was suggested to integrate more visual presentation in the tool that present more results and relationship between data. A software consultant suggested specifying one window for each section in the dashboard and adding more graphical charts with different relationships of the window's content. For example, a window for risk information that show chart for reported risks for each activity or observers concern level associated with each risk in certain activity.

- There was an important comment in regard to the usefulness of the tool. Usefulness refers to the extent the tool (and information provided by it) is perceived as helpful during decision-making process (Li et al. 2012). A software engineer stated that the tool displays the results of users' inquiries on the same tables, charts, and delete the results of the old inquires. He argued that this way of presenting the results might affect the ease of seeing the differences between the new and old inquiries. To solve this problem and help decision-makers to notice the trends on their inquiries, It was suggested to create report for each inquiry in a separate page and allow the users to save and print this report for further auditing and investigation.

8.4.4 QUALITY CRITERIA FOR THE ASSESSMENT PROCESS

This section presents the results in relation to the survey provided to the participants at the end of the evaluation session. The results are related to the four criteria defined in section 8.1.

- **Understandability**

This aspect was necessary for the evaluation of the assessment method. Understandability can involve several aspects such as clarity, concision and organised structure. During designing the assessment method, the researcher aimed to provide a clear and straightforward method with less complicated details that can be readable and understandable for people with different knowledge about risk analysis.

The evaluation study involved participants from different backgrounds and experience in system analysis and requirement engineering. It was noted from the evaluation sessions and the survey's answers that there is a consensus that the assessment method was described in a well-structured format with a reasonable amount of details. One participant described the content of the assessment method as "*seamless and straight to the point*". The method was described as two stages (i.e., preparation and action). For each stage, there was a description of its activities, used materials and expected outcomes. This structure helps the participants to follow the steps for each activity and predict the needed outcomes for the next activities.

Regarding the supporting materials, including risk analysis tool and goal-based risk analysis techniques, participants' answers show that the description of the supporting materials was helpful in understanding how to use them. A participant stated that *"the tool was user-friendly"* and *"do not require high knowledge in analysis"*. The tool was designed to be a business intelligence tool that enables system analysts to run several analytical inquiries. Moreover, it aims to help decision-makers to accelerate the planning for mitigation process. System analyst commented, *"the content in the tool was reasonable to understand the whole results in one setting*". Although the goal-based risk analysis

techniques were lacking some details, the participants found the description of the techniques sufficient to cover the mechanism of the analysis techniques. It was stated that the tool and the analysis techniques are complementary to each other to facilitate the assessment process and save time and effort in the decision-making process.

- **Comprehensive**

It is an aspect that describes the inclusion of all needed elements and materials in the assessment method. The assessment method was provided to participants with all materials that support the usability and understandability of the assessment method. The materials were in a form of documents that include a list of risk and risk factors, a description of the terms in the observation sheet and guidelines for the risk analysis tool and the goal-based risk analysis techniques. In regards to these documents, it was generally stated that these materials were a reference for the participants to clarify the contexts and the situations that suitable for the purpose of the assessment method.

There were some suggestions to improve the completeness and quality of the assessment method. As discussed in the previous section that some amendments have been suggested to be made in the document of the risk matrix. The risk ranking technique might need to separate the risk in relation to tasks from the risk associated with goals for obtaining better insights into the effect of the identified risks on the organisational structure. It was also suggested to augment the risk ranking and risk stakeholders' techniques with some steps to organise the selection of the risks to implement these techniques.

- **Effectiveness**

This aspect represents the ability of the assessment method and the supporting materials to identify, prioritise, and assess the risks of online social transparency. The effectiveness of the assessment method and the supporting materials have been compared with the traditional methods used for risk analysis such as prediction and interviewing. The evaluation has shown a general satisfaction with the effectiveness of the proposed method in identifying and assessing the risks. It was advocated that the use of an observation sheet was a creative method to extract the risks from real situations and support the accuracy of the identified risks. The participants argued that interviewing might be another way of detecting risks from real context, but it may rely on the recall of the previous situations while the observation sheet can be used to detect risks from a real-time context.

The risk analysis tool and goal-based risk analysis techniques were the essential additions that improve the effectiveness of the assessment method. After performing the identification and assessment of the risks with and without the supporting materials, there was a general endorsement that these materials were useful in answering participants' inquiries. It was also agreed that the tool enables participants to browse all potential causes of certain risks that may occur in different

activities. The tool succeeded in producing comprehensive results from the data collected from the employees. There was a suggestion to integrate the goal-based risk analysis techniques in the tool to produce risk ranking and risk stakeholders automatically. This suggestion will be considered in the future work of this research.

- **Helpfulness**

It is an aspect that presents the ability of the assessment method to provide help and benefits to the assessment team. This method aims to help the organisations to assess the real implementation of online social transparency in their work environments. The risk of online social transparency is unremarkable in these organisations. It was stated that the assessment method enables *"the management to track personnel who are under threats due to online social transparency"*. Therefore, the evaluation study approves that the assessment method and the supporting materials were helpful in recognising the risks that are found in the work environment and their factors that cause the occurrence of these risks.

The helpfulness of the assessment method was not just about the ability to identify and prioritise the risks; it was also about the integration of some features in the risk analysis tool. For example, the filtering feature in the analysis tool has been seen as an essential feature to facilitate the investigation process. Moreover, system analysts pointed out that the visual presentation of the results was necessary to understand trends and gain general insights about the collected observations. Some participants required adding more statistics about the correlation between observers and observees as well as a visual presentation for the risk factors.

The helpfulness of the risk analysis tool went beyond the ability to identify the risk and their factors to the ability to create further analysis techniques and diagrams. It was agreed that the tool facilitate the extraction of any required information if the decision-makers required more analysis diagrams. For example, system analysts stated that the cause and effect diagram could be created quickly and in a short time by using the tool. It was pointed out that this tool will help decision-makers in creating further analysis to support the accuracy of their decision, particularly in planning for mitigation strategies.

8.5   THREATS TO VALIDITY

This section presents the threats, which might affect the validity and quality of the evaluation study.

- The selection of the assessment team in the company was based on personal connections with the researcher. This kind of sampling may affect the trustworthiness of the answers. However, this selection criterion is common for the research that needs obtaining a sample easily. People

are yet aware of the risk of social transparency and they concern that discussion of this topic may affect the general impression of their organisations. Therefore, the researcher selects participants who already have a trust relationship with them. Moreover, participants signed a consent form that confirms the anonymity and confidentiality of their information and identity.

- The evaluation study was conducted online for two reasons; (i) the distributed location of the company and (ii) the separation of the evaluation sessions made it difficult for the researcher to travel several times. The absence of physical presence in the evaluation session may affect the validity of the observation results. However, the evaluation session was conducted through video conferencing meeting which allows the researcher to observe the session. In addition, the researcher assigned a facilitator to lead the discussion and the session in case of the occurrence of internet problems. The sessions were recorded by the researcher and the facilitator for further analysis and to ensure the quality of the participants' sounds during the discussion.

- The participants were provided with documents that include a predefined list of risks and risk factors that resulted from the studies of this research. The aim was to make them familiar with the potential risk that might occur due to practicing online social transparency. There was a concern that these documents may influence their thinking. For example, they may adopt to a large extent the risk types described in the document and they may fail to produce new types. However, the researcher stressed out that these risks are just examples and they are not exclusive to a particular type of organisations. The participants were asked to provide their personal perceptions and feelings in relation to the effect of online social transparency.

- It was mentioned before that participants were concern that the results of the assessment method might not reflect the real situation of online social transparency. Due to the limit number of observations provided from employees, the results of the assessment method do not present a full insight into the practice of online social transparency. However, data of social transparency was designed to be collected by observation sheet based on the voluntary participation of the employees and not regulated with any policies. Then, it was assumed that the collected data was the only data provided voluntarily form employees. As future work, the method may integrate some gamification techniques to motivate the employees to participate more in the assessment of online social transparency in their organisation.

- The evaluation study involved 8 participants from the selected company acted as assessment team. Only 3 of them were considered experts in risk analysis. The evaluation study would have benefited from a large number of experts to help the participants in making decisions,

particularly the impact of the risk in organisational structure. However, the participants came from a variety of backgrounds in systems analysis and requirements engineering, meaning that the evaluation study still benefited from their diversity of views.

- The time limit given to the participants was constrained. This could affect the quality of their performance and discussion as raised by some of them. However, the engagement of experts and highly experienced analysts were helpful in accelerating the discussion, particularly decision in the goal-based risk analysis techniques. However, the open-ended survey was designed to overcome this limitation and enable the participant to freely provide their insights and suggestions in the proposed assessment method and its supporting materials.

8.6   CHAPTER SUMMARY

This chapter presented the approach taken to evaluate the assessment method and its supporting materials proposed in this research. The assessment method aimed to identify, prioritise and assess the risk of online social transparency in organisational settings. The method was evaluated first with managers through an expert checking to improve some of the artefacts, particularly the observation sheet. The assessment method and its supporting materials were then evaluated using a case study approach, which helped to investigate and draw some conclusions in how assessment of online social transparency will be managed with and without the use of the designated method.

9. CONCLUSION, CONTRIBUTIONS AND FUTURE WORKS

To conclude this thesis, this chapter presents the benefits, contribution to knowledge and possible future works.

9.1 CONCLUSION AND BENEFITS

Online social transparency is an emerging behavioural phenomenon that resulted from the integration of digital media in the enterprise information systems. It is defined in this thesis as

The voluntary use of online platforms by the members of an organisation to share their own information about their situations, roles, and responsibilities with other members. (Alsaedi et al. 2019a)

As discussed in this thesis, social transparency in enterprise applications can enable team members to gather information, learn from each other, detect real-time events, increase collaboration amongst each other, and enhance decision-making processes. The goal is to enable the enterprise to reach its strategic goals more rapidly and at the same time, maintain quality and social requirements such as job satisfaction and perception of openness and fairness. However, our findings indicate that introducing social transparency services into enterprise information systems can also introduce risks, which can stem from the unguided and completely open style of sharing information within the workspace. For example, a high level of real-time transparency between team members can lead to risks of information misuse, undesirable staff groupings, stressful competitions and information overload (Laud and Schepers 2009).

Although existing works illuminate the potential promise of managing social transparency in the enterprise, particularly in their online platforms. There is still a limitation in providing conceptualisations and methods to assess it systematically. As a result, this research advocated the need for a systematic method to identify, prioritise and assess the risk of social transparency. This research involved several empirical studies to collectively help to fulfil its objectives, achieve its main purpose, and propose an assessment method that helps decision-makers to be aware of the risk level of social transparency in their organisations.

There are several benefits to the concepts adopted in this research that is:

- **Managing social transparency in online enterprise platforms** i.e. by identifying the unremarkable aspect of social transparency which is related to the openness of individual intentions. This thesis approved the practice of such kind of transparency and the potential

side effects that resulted from its unmanaged practice. This method enables the enterprise management to manage social transparency in their online platforms effectively.

- **Identifying the risks of social behaviour** that were unremarkable in the enterprise. This research informs the possible side effects of being open about individual's intentions and reasoning behind these intentions. For example, a member of a team might be open about his/her intentions to perform some works, but they may not explicitly reveal appropriate and complete reasoning about their intentions. This missing information on social transparency can lead to undesired consequences such as stress, delay in the team progress and peers' misjudgement. This thesis proposed an assessment method that allows enterprise management to capture and detect the risks of sharing intentions and reasoning amongst enterprise members.

- **Capturing the risks from real context,** e.g., by proposing an observation sheet as risks identification technique. The proposed sheet detects the risks based on the employees' observations of social transparency in the enterprise online platform. Due to the dynamic nature of social transparency in this thesis, traditional risk identification techniques might cost large enterprise a significant amount of time and effort to capture the risks of social transparency. The proposed risk identification technique in this thesis was designed to reduce the assessment cost and time for enterprises that have a high number of employees and resources.

- **Access to a wider and diverse set of enterprise members and contexts** that might be unpredictable by using traditional techniques. For example, in using scenario-based techniques to predict the risk of social transparency, it cannot be certain how employees' impressions about the situation introduced in the scenarios. Similarly, Interviews can be used to collect data from real enterprise members, but it might take a long time to cover all employees in the enterprise. The proposed assessment method was designed to keep up with the rapid nature of social transparency and allow all the enterprise members to provide up-to-date information about undesired social transparency on a daily basis and with short amount of time. This helps in maintaining the analysis results up to date.

- **Inform the decisions of the mitigation plan, e.g.** by introducing a more structured designated tool for risk assessment that enables its users to obtain useful and meaningful information. Integrating the assessment method with a risk analysis tool helped in accelerating the decision-making in planning for a mitigation process.

This section represents the main contributions of this thesis that answer the research questions and advance the knowledge about the assessment of online social transparency in an enterprise system with the target of detecting the risks and their sources. It also involves a supplementary contribution that helps the researcher in designing the thesis's outcomes.

- **Contribution 1: Exploration of the online social transparency as voluntary behaviour in organisational settings (Main Contribution)**

The main aim of this research was to investigate the unsearched aspect of online social transparency. Online social transparency has been researched in several works from the technical aspect of the social software, i.e., the features of the social software. These works investigated the regulated aspect of the concept. However, the novelty in this research comes from the focus on the subject of online social transparency and its correlation with organisational model, particularly sharing intentions and reasoning.

The first study in this thesis was an exploratory study with actual organisational members from academia and industry to discuss the various aspects of voluntary social transparency in their work environment. This study also aimed to explore the factors that might introduce consequences when practicing social transparency in enterprise social software. This study resulted in a set of assessment factors needed in designing a comprehensive method to evaluate the impact of online social transparency. This contribution helped in enriching the area of social transparency by proposing new dimensions that could help system analysts and designers in providing elements for developing the implementation of online social transparency within the organisational settings. This contribution was discussed in Chapter 4.

- **Contribution 2: Identification of the potential risks of online social transparency (Main Contribution)**

The results of the first study increased the researcher's curiosity to explore in-depth the potential consequences of the unguided implementation of online social transparency. The literature of organisational behaviour and social transparency lacks a comprehensive knowledge about the risks that might stem from the ad-hoc implementation of online social transparency.

Thus, the second study in this research aimed to explore more the risks and risk factors of online social transparency and associated them with the assessment factors explored in the first study. This contribution was achieved by conducting a semi-structured interview with organisational members from various affiliations and workplaces. As mentioned in the first contribution that this research is exploring the concept and its relation to the organisational model. The exploration of the risk and risk

factors was based on the elements of the organisational goal model. i.e., intention and reasoning in relation to actors, goals, tasks, resources and actors' dependencies. This research introduces a set of risk factors that needed in designing an assessment method for online social transparency.

- **Contribution 3: Building a reference model for assessing the implementation of online social transparency (Supplementary Contribution)**

This thesis produces a reference model that helps system analysts in understanding the assessment process of online social transparency. The structure of the reference model has been built based on the results of the first and second studies in this thesis. The assessment factors in the reference model were taken from the results of the first study. The details of the risks or risk factors are resulted from the second study.

While some reference models were proposed in the literature to manage transparency in information systems, risk factors and risks were not their focus. Therefore, the reference model introduced in this thesis is meant to be a foundation for the enterprise's online transparency assessment methods. The assessment goal would be to analyse whether transparency is implemented in a way that makes relevant information available promptly to the right recipients with minimum diverse effects on other members in the enterprise

- **Contribution 4: Proposing a method to assess the risks of online social transparency (Main Contribution)**

In this thesis, we provided empirical evidence that online social transparency is associated with risks and needs a systematic method so that they can be diagnosed and assessed. This thesis contributed to the body of knowledge by providing a comprehensive method to identify and assess the main factors that can lead to social transparency risks and adverse effects in the workplace. The proposed method described in Chapter 7 is used by as a diagnostic system to help decision-makers (system analysts and enterprise management) to capture and detect the sources of transparency side effects. This method adopted the participatory approach to involve employees, system analysts, and management in the decision-making process. System analysts and system designers can use the proposed method in the development stage of the information system. The method can be used to elicit the requirements for redesign the information system to hinder the risks of social transparency by making the online platforms more sensitive to employees' activities, context and preferences.

- **Contribution 5: Developing a new systematic risk identification method (Main Contribution)**

Due to the unremarkable nature of social transparency impact, a structured method of risk identification was developed. An observation sheet was designed based on the self-reporting techniques to obtain employees' responses in regard to undesired situations of social transparency.

The observation sheet presented in Table 14 was devised using the findings in Chapters 5 and 6. Furthermore, it provides systematic means that enable employees to identify the risks from a real context and on a daily basis. This new identification technique is the foundation step in the proposed assessment method. It does not only provide a structured means for capturing daily observations but also adds further usefulness as it helps employees in providing accurate observations as well as helps system analysts to correctly identify the risk and risk factors from real contexts.

- **Contribution 6: Developing a prototype of a risk analysis tool to analyse the employee observations (Main Contribution)**

The novel assessment method for social transparency that was developed in this research is also supported by a tool that enables decision-makers to manipulate the collected data quickly and in cost-efficient way. This tool analyses the data through an automated process to provide trends and insights on the current practice of online social transparency. The tool described in Chapter 7 was designed as a business intelligence tool that involves an interactive dashboard to enable decision-makers to easily visualise the data, filter on-demand, and slice the data to dig in deeper. It also empowers the decision-makers to answer critical business questions and view the data from different perspectives. The tool enables systems analysts to easily generate different types of analysis diagrams that may help in making well-informed decisions such as cause and effect and decision tree analysis.

- **Contribution 7: Developing two goal-based risk analysis techniques (Main Contribution)**

As mentioned in the first contribution, that transparency in this research is mainly about personal intentions, goals, plans, tasks and social interdependencies. The analysis in this research was based on the goal-oriented modelling. This research developed two novel techniques based on the organisational goal model. The first technique is a goal-based risk ranking technique, which ranks the impact of the risk based on the characteristics of the activities reported by employees. The second technique is a goal-based risk stakeholders' wheel that identifies a circle of stakeholders who may be influenced by the occurrence of the reported risks. Both techniques used the organisational goal model and risk analysis tool to determine the impact of the reported risks. These techniques enable system analysts and organisation management to perceive the impact level of the reported risks and to identity to what extent these risks may affect the employees and organisation in general.

9.3   FUTURE WORKS

This section presents the possible future works of this thesis. The following are some suggestions of the future works to extend and optimise the assessment method of online social transparency

1. **Involving External Stakeholders in the Research**

The empirical studies in this thesis, i.e., focus group and interview was conducted with organisational internal stakeholders. The finding of this research can be enriched by conducting an interview with external stakeholders. The purpose of the involvement of the external stakeholders is to extract the most frequent problems that external stakeholders encounter from the social transparency of internal stakeholders. During the observation study, it was noted that some external stakeholders were members in some conversation forums in enterprise social software such as Slack. Therefore, their opinions and thoughts in the research problem can be seen as a valuable addition to the research outcomes. Moreover, the goal-based risk stakeholder technique that designed in this thesis is used to recognise the direct and indirect internal stakeholders for the identified risks. However, there is a possibility that risk priority may change if the external stakeholders has also involved in the formation of this technique.

2. **Integrating Design Principle of Digital Motivation**

It was described in chapter 7 that the identification of the risks and risk factors is based on the voluntary provision of undesired social transparency behaviour. An observation sheet was proposed as a technique for risk identification in this thesis. The purpose was to encourage and give the employees the freedom to report about the negative impact of social transparency practiced in enterprise social software. However, during the evaluation study, there was a concern about the potentiality of providing few observations.

Similarly, Activity 1.2 in the assessment method suggested that the assessment team will involve volunteers from different roles in the enterprise alongside system analysts and management. As a future work, the benefits of the voluntary provision and participation of employees could be increased by integrating some gamification elements in the assessment method. Gamification could be employed as a motivational technique for employees and it can be managed with monitoring or auditing techniques to prevent any chance of providing inaccurate information.

3. **Implementation of the Risk Analysis Tool**

This thesis proposed a prototype of the risk analysis tool and evaluated it with different users to improve the design of the tool. Valuable suggestions have been given in the evaluation study. The researcher intended to consider these suggestions and implement the risk analysis tool as a usable software. One of the important suggestions is to integrate the enterprise goal model in the tool to enable the users to choose their activities based on a predefined enterprise model. This would unify the activities descriptions and names during the assessment process.

Another important suggestion to be considered in the implemented version of the tool is the automation of the goal-based risk analysis techniques. This automation will benefit from the

integration of the enterprise goal model in the risk analysis tool. The risk ranking and the risk stakeholders' wheel will be provided automatically based on demand from the assessment team for each identified risk.

4. Proposing Mitigation Strategies

This thesis took the first step in assessing the impact of the online social transparency. It proposed a detective approach to identify the risks of this social behaviour within organisational setting. The proposed assessment method was designed to support system analysts and managers in decision-making process and facilitating the planning for mitigation strategies. As a future work, further studies could be conducted to propose various mitigation strategies. This work will help decision-makers to link the risk impact easily with an appropriate mitigation technique. It was noted during this research that participants became more careful with their social transparency behaviour to reduce the unintentional impact of their behaviour on colleagues. Therefore, raising awareness can be seen as one of the mitigation strategies that can be used in the enterprise to reduce the risks of social transparency. Management can conduct an open meeting with all employees to raise awareness about the risks and the impact of these risks of the employees' productivity and organisational overall performance.

5. Enhancing the Risk Analysis Tool with Recommender System

In relation to the previous point, the risk analysis tool can also benefit from the integration of recommender systems. The risk analysis tool was designed to help decision-makers to identify, prioritise and assess the risk of social transparency. It will be also a valuable extension to include the mitigation strategies in the tool and allow the tool to recommend these strategies based on the risks' characteristics. The utilisation of the recommender systems will facilitate and accelerate the decision-making process. The following point are some examples of the cases that can be provided by the recommender systems.

- **Information Reusability:** The recommender system can benefit the employees and the assessment team. The recommender system can be included in the software version of the observation sheet. When the employees enter the risk and risk factor, the system can compare them with pre-stored cases of similar risk factors and provide a list of predefined risks from the previous observation. This would help the users to precisely define the risk and help the organisation to limit the list of the reported risks. Moreover, when the employee enters the risk, the analysis and query tools could be utilised to start searching in the list of previously stored cases to retrieve the factors that were reported with this kind of risk. Similarly, the recommender system can be included in the risk analysis tool to provide the assessment team with a list of mitigation strategies that have been identified for similar risks.

- **Problem Prioritisation:** In the software version of the observation sheet, if the employee entered the details of the risk, the recommender system can retrieve the information of the previous similar reported situations. The user can be asked to either confirm that the new details are for different cases or the same case from previous observations. If the employee informed that he/she has similar cases reported before, then the system will increase the priority of this case.

- **Investigation for Missing Information:** It was noted during the evaluation study that some employees failed to provide details about the risk factors (i.e. Meta information of the risk factors). It was noted that missing of some information led to the rejection of the reported cases to be considered in the assessment process. When the employee provides an observation sheet with some missing meta information, the analysis and query tools can search previously entered cases to detect similarity between this case and the stored cases with the same risk and risk factors. The recommender systems then can provide the assessment team with the type of missing information to enable them to make a correct decision and avoid the rejection of cases with missing information.

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# 11.	APPENDICES

## 11.1	COPY OF RESEARCH ETHICS CHECKLIST

Research Ethics Checklist

Bournemouth University

Reference Id	20931
Status	Approved
Date Approved	16/04/2018

Researcher Details

Name	Tahani Alsaedi
Faculty	Faculty of Science & Technology
Status	Postgraduate Research (MRes, MPhil, PhD, DProf, DEng)
Course	Postgraduate Research - FST
Have you received external funding to support this research project?	No

Project Details

Title	Engineering Transparency as a Motivation in Organizational Information Systems
Proposed Start Date of Data Collection	23/04/2018
Proposed End Date of Project	19/09/2020
Supervisor	Raian Ali
Approver	Marcin Budka

Summary - no more than 500 words (including detail on background methodology, sample, outcomes, etc.)

11.2.1   PARTICIPANT INFORMATION SHEET

Participant Information Sheet

The title of the research project

Assessing Online Social Transparency in Enterprise Information Systems

Invitation

You are being invited to consider taking part in this research study. This research conducted by Tahani Alsaedi, a PhD student in the Department of Computing and Informatics at Bournemouth University.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully and discuss it with friends and relatives if you wish. Ask us if there is anything that is unclear or if you would like more information.

What is the purpose of the project?

The aim of this research is to propose a method to assess online social transparency in the enterprise information systems. The assessment method will help requirements engineers and system analysts in the decision-making process to identify and assess the risks of social transparency that may affect the individual and organisational productivity..

Why have I been invited to take part?

You have been invited because of your background and experience as users or experts of information systems. You have been invited because we think that you can comment and give feedback on the problem space of the research topic and the possible solutions to incorporate transparency in requirements engineering.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a participant agreement form. Also, you may need to provide your email address to allow the researcher to contact you for any further clarifications regarding the study if necessary. You will not be identified or identifiable in the outputs that result from the research and the email address will be removed after the data are collected and transcribed so that the data will become totally anonymous. You can withdraw at any time, up to the point where the data are processed and become anonymous, so your identity cannot be determined, without affecting any benefits that you are entitled to in any way. You do not have to give a reason. Deciding to take part or not will not adversely affect you.

What would taking part involve?

You will be asked to participate in the following activity:

• **Focus group sessions:** in which the researcher will invite you and a number of individuals to discuss a topic in relation to the problem. The session will involve individual activities and group activities to discuss the research problem and achieve the first research question.

What are the advantages and possible disadvantages or risks of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will improve our understanding of the concept of online social transparency and its assessment factors that used to manage its negative consequences in enterprise work environment. There are no speculated risks of taking part of this study.

Will my taking part in this study be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications. All data relating to this study will be kept for five years on a BU password protected secure network.

Will I be recorded, and how will the recorded media be used?

Yes, you will be recorded if you take part in the focus group. The recording will help the research team to capture the information that will be sought from you during the focus group. However, you will be given the right to accept or reject recording the session. No other use will be made of the recording without your written permission, and no one outside the research team will be allowed access to the original recordings. The audio recordings made during this research will be deleted once transcribed and anonymised. The transcription will not include your name or any identifiable information. Instead, each person will be identified by their code (i.e. #id523741, #id523753, etc.).

Contact for further information
If you have any queries about this research, please contact me using the following contact details:
 Tahani Alsaedi
 E-mail: Talsaedi@bournemouth.ac.uk
 Bournemouth University, Faculty of Science and Technology
 Talbot Campus, Fern Barrow, Poole, BH12 5BB, Tel: 01202 968140

Complaints
If you have any complaints about this project please contact Professor Tiantian Zhang, Deputy Dean for Research and Professional Practice of the Faculty of Science and Technology at Bournemouth University at the following address:
Professor Tiantian Zhang
E-mail: researchgovernance@bournemouth.ac.uk
Bournemouth University, Faculty of Science and Technology
Talbot Campus, Fern Barrow, Poole, BH12 5BB, Tel: 01202 965721

Thank you for taking the time to read this information sheet, and please do not hesitate to contact me if you have any queries.

Participant Consent Form

Study Title: Assessing Online Social Transparency in Enterprise Information Systems

Researcher Information

Tahani Alsaedi (Talsaedi@bournemouth.ac.uk)

Faculty of Science & Technology
Bournemouth University

Supervisor Information

Dr. Raian Ali (rali@bournemouth.ac.uk)
Faculty of Science & Technology
Bournemouth University

Please initial here

I have read and understood the participant information sheet for the above research project.	
I confirm that I have had the opportunity to ask questions.	
I understand that my participation is voluntary.	
I understand that I am free to withdraw up to the point where the data are processed and become anonymous, so my identity cannot be determined.	
During the tasks of the study, I am free to withdraw without giving a reason and without there being any negative consequences.	
Should I not wish to answer any particular question(s) or complete a test, I am free to decline.	
I give my permission for members of the research team to have access to my anonymised responses. I understand that my name and email address will not be linked with the research materials and I will not be identified or identifiable in the outputs that result from the research.	
I understand that taking part in the research may include being recorded (audio) but these recordings will be deleted once transcribed and anonymised.	
I agree to take part in the above research project.	

11.2.3   FOCUS GROUP SCENARIOS AND QUESTIONS

Main Scenario:

You work in an organisation that has personal profile for each member. Your personal profile consists of three sections:

- **Employee dashboard** contains a brief overview of activity that is currently happening in your account. Here you will see your name, job title, contact information and profile picture. You will also find your current summary of the amount of time available for your account's primary leave type, the number of Kudos you have received, as well as the number of Goals and Reviews that are currently in progress.
- **Performance Management** tab incorporates elements on the employee's profile such as **Kudos & Notes**, **Goals, Skills** and **Shared Feedback**. These elements help measuring employee's performance.
- **Employee Information** Drop Down that shows the expandable sections of your profile. These sections contain general information about your account, employee history, notes and your time off days.

All this information can be shared with or accessed by your colleagues and managers. And also, you will be able to see the same information for each member in the organisation. The whole point is that this profile allows you and every member in the organisation to see the performance in a daily routine. This process is part of what we call transparency in organisation, which is defined as freely sharing information and understanding other's intentions and goals.

This study is focused on the effect of online social transparency on the workplaces. You will be asked questions based on the literature review of social transparency in workplace.

Note: information transparency not related to privacy and security information. Moreover, it is not related to functional information that can affect the performance of tasks. It is information that helps in motivating others to engage or cooperate in task. For example, revealing status of the current task (this task is in progress) may motivate others who interested in this task to provide feedback.

Figure 1: Employee Profile contents

Figure 2: progress of the active goals

Please read the following scenarios and answer the questions. If there are any comments, please write them at the end of the page.

Scenario 1

Mark is a designer in the graphics and animation department of a company that is interested in e-learning and e-publishing. He was working with a team to design an animated video for e-learning training. Each member has a profile page on the organisation's website. The design of the profile page was simple and it allows them to post basic information such as personal details, contact details, and status. Mark uses the status feature to describe his current work or to inform his colleagues if he is busy. One of the posts on his profile was "**Editing audios is a tough task.**" the post was visible to all members in the company. Therefore, his team knows that he is capable of doing the task but they think that he currently does not want any interruptions. The project manager expected him to finish the task by the end of the week because the project should be delivered within three weeks. However, when he saw Mark's post, he thought that Mark was not capable of finishing the task on time and so he decided to delegate the task to someone who was more competent.

Questions

- **What was the issue that cause the problem with the manager in this scenario?**

- **Mark likes to share his work status with others in the company, why he did that? In other word, what he wants to avoid or seek by sharing his work status with others?**

- **The profile page should describe more details about the task that mark was working on to avoid any misunderstanding from others, Can you suggest more details to be added to the profile to help mark to share his work status without causing misconception with others.**

- **Do you think that the same details should be shared with two different people such as manager and colleagues? please give justification for your answer**

Scenario 2

Richard is a lecturer of two modules in the computing department and he is also the head of the department. He usually deals with several things besides providing lectures such as meetings and responding to emails. Some of the emails come from his students regarding assignments enquires or other enquires. He does not have a fixed way in which he replies to emails but he does not ignore them. He responds to the emails when he is available but the emails may be delivered late to students. His students thought that he does not consider their needs because he does not always reply to their emails on time. They would like to know the reasons behind late responses. That adversely affects their self-esteem because he might respond to some students on time and others may get a late response. At the end of each semester, the faculty conducts a survey that asks students to

provide feedback about the modules and lecturers. Richard received negative feedback from his students regarding his late responses to their emails. Before that, He does not think that his attitude will affect the relationship with his students.

Questions

- **What was the problem between Richard and his students?**

- **Richard never ignores the emails but there was a misconception from his students, what do you think the reasons which cause this misconception?**

- **One of Richard's colleagues advised him to be open with others about his availability, Why do you think being open is important in this scenario?**

- **If you were one of Richard students, why do you want him to be open with you? In other words, what do you feel when he tells you about his availability?**

- **If you were asked to design an email page for Richard, what do you think the information that students or others should know about to avoid the misconception?**

Scenario 3

Jimmy is a lecturer in a university. He teaches two modules in the department of computer science. He has in total 120 students in both modules. He got submitted assignments for each module. He has to prepare the grades in two weeks. Jimmy has not started the marking yet and he has to attend a conference for 4 days which may cause a delay in preparing the grades. He thinks that Russell (his lab assistant) can help him in marking the assignments. He met Russel in the lunch break and informed him that he has 120 programming assignments to mark and they should be ready in two weeks. Despite that Russell has a good experience in reading the programming texts but he did not offer any help because he is working on preparing the material for the lab sessions.

Questions

- **How can you describe what happened between Jimmy and Russell?**

- **What do you think the causes of the misunderstanding between Jimmy and Russell?**

- **If you were Jimmy, How can you motivate Russell to help you in the marking process?**

- **Russell will help Jimmy in the marking if he fully understands the current situation, what are the details that describe the current situation of Jimmy? In other words, what is the information that describes Jimmy's tasks?**

Scenario 4

An airline company has many complaints from customers about not answering their calls or put them on hold for a long time. The company aims to increase the number of calls that are answered to satisfy the customers and increase productivity. As a result of a close meeting between the director and the supervisors, they found options that help in increasing the number of answered calls. For example, sending frequently asked questions to an automated answer, answering queries via email, reducing time spent on hold or reducing call duration. Then supervisors inform their groups about these options without providing any justifications about the plan and the options. The employees do not have idea why these options have been provided. Later, the company noticed that there are still complaints about the same issues from the customers.

Questions

- **It can be noticed from the scenario that the employee did not work based on the proposed plan, what might be the reasons that make them not take actions?**

- **How do you think the supervisors can make their teams act based on the plan and reduce the complaints from customers?**

- **Do you think making open meeting with employees will make them feel motivated? Why?**

- **If you were an employee, what is the information that makes you feel the importance of the giving options?**

Theme	Sub-theme	Quotes
Transparency as situation awareness	obstacles	In Scenario 1, "if Mark see that this task is difficult ,he should say what are the reasons that make it difficult for him, maybe he use old editing program and he needs more advanced one " **F1.4**
Transparency as motivation	Individual growth	In Scenario 3, "Jimmy can tell Russel that if he attend the conference put his name or he can contact people in the conference to help him to go to the next one" **F1.5** In scenario 3, "Jimmy can offer Russel a favour or benefits such as marking his assignments " **F1.9** In scenario 3, "Jimmy can put some acknowledgment or writing good feedback that help Russel to get promotion" **F1.7**
Transparency timeliness	prompt action	In scenario 2, "he can set an auto reply to say what he has on hand without too much details" **F1.8**
	Informing before activity	In scenario 2, "the student are not aware about the regulation and the lecturer has not make them aware about it" **F1.1** In scenario 2, " he can share his timetable with student, then they know when he will be free and when not" **F1.9** In scenario 2, "he can set a status feature in his email , so students can see it before sending email to minimise their expectations" **F1.3**
Transparency Presentation	Numerical Information	In scenario 4," if I know in percentage the benefits of each solution in solving the problem, that will make me take action because I decide to take the option with high percentage" **F2.5**
Recipients' Diversity	Background	In scenario 1, "the manager may not have technical background about editing the audios" **F2.3**
	Shared workplace	In scenario 1, "His team were with him. so, they know what he meant by posting the message" **F2.3**

11.3.1   PARTICIPANT INFORMATION SHEET

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What would taking part involve?

You will be asked to participate in the following activity:

• **Interview sessions**: in which the researcher will discuss with you individually about various aspects of the problem and potential solutions. Your personal experience and opinion will be sought.

What are the advantages and possible disadvantages or risks of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will improve our understanding of eliciting transparency requirements that used to motivate cooperation in information systems. There are not speculated risks of taking part of this study.

Will my taking part in this study be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications. All data relating to this study will be kept for five years on a BU password protected secure network.

Will I be recorded, and how will the recorded media be used?

Yes, you will be recorded if you take part in the interview stage. The recording will help the research team to capture the information that will be sought from you during the interview. However, you will be given the right to accept or reject recording the interview. No other use will be made of the recording without your written permission, and no one outside the research team will be allowed access to the original recordings. The audio recordings made during this research will be deleted once transcribed and anonymised. The transcription of the interviews will not include your name or any identifiable information. Instead, each person will be identified by their code (i.e. #id523741, #id523753, etc.).

Contact for further information
If you have any queries about this research, please contact me using the following contact details:
 Tahani Alsaedi
 E-mail: Talsaedi@bournemouth.ac.uk
 Bournemouth University, Faculty of Science and Technology
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Complaints
If you have any complaints about this project please contact Professor Tiantian Zhang, Deputy Dean for Research and Professional Practice of the Faculty of Science and Technology at Bournemouth University at the following address:
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Thank you for taking the time to read this information sheet, and please do not hesitate to contact me if you have any queries.

Participant Consent Form

Study Title: Assessing Online Social Transparency in Enterprise Information Systems

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Please initial here

I have read and understood the participant information sheet for the above research project.	
I confirm that I have had the opportunity to ask questions.	
I understand that my participation is voluntary.	
I understand that I am free to withdraw up to the point where the data are processed and become anonymous, so my identity cannot be determined.	
During the tasks of the study, I am free to withdraw without giving a reason and without there being any negative consequences.	
Should I not wish to answer any particular question(s) or complete a test, I am free to decline.	
I give my permission for members of the research team to have access to my anonymised responses. I understand that my name and email address will not be linked with the research materials and I will not be identified or identifiable in the outputs that result from the research.	
I understand that taking part in the research may include being recorded (audio) but these recordings will be deleted once transcribed and anonymised.	

I agree to take part in the above research project.	

Name or Initials of the Participant   Date   Signature

11.3.3   INTERVIEW QUESTIONS

Main Scenario:

You work in an organisation that has personal profile for each member. Your personal profile consists of three sections:

- **Employee dashboard** contains a brief overview of activity that is currently happening in your account. Here you will see your name, job title, contact information and profile picture. You will also find your current summary of the amount of time available for your account's primary leave type, the number of Kudos you have received, as well as the number of Goals and Reviews that are currently in progress.
- **Performance Management** tab incorporates elements on the employee's profile such as **Kudos & Notes**, **Goals, Skills** and **Shared Feedback**. These elements help measuring employee's performance.
- **Employee Information** Drop Down that shows the expandable sections of your profile. These sections contain general information about your account, employee history, notes and your time off days.

All these information can be shared with or accessed by your colleagues and managers. And also you will be able to see the same information for each member in the organisation. The whole point is that this profile allows you and every member in the organisation to see the performance in a daily routine. This process is part of what we call transparency in organisation, which is defined as freely sharing information and understanding other's intentions and goals.

This study is focused on the effect of transparency on motivation in workplaces. You will be asked questions based on the literature review of transparency and motivation in workplace.

Note: information transparency not related to privacy and security information. Also it is not related to functional information that can affect the performance of tasks. It is information that helps in motivating others to engage or cooperate in task. For example, revealing status of the current task (this task is in progress) may motivate others who interested in this task to provide feedback.

Introductory Questions

- Would you please introduce yourself, your name and age?
- Where do you work?
- What is your job or role in your workplace?
- Have you heard about transparency in the workplace?
- Does your workplace adopt transparency in its communication?

Rationale: these questions meant to be clustering questions to investigate whether people opinions differ according to their position in the organisation.

-

Interview Questions

1. **In the literature, there are several definitions about transparency. In most cases it can be used as a mean of making information visible. How do you differentiate transparency from other concepts such as secrecy and privacy?**
   - **Rationale:** this question is asked to identify the fine line between transparency and privacy or secrecy. This question will start the discussion about what we mean of transparency in my research and prevent participant from mixing between the two concepts.
2. **Transparency seen as an effective value of successful organisations. However, making information visible may not be beneficial, it may cause negative competition or bias amongst employee. What make transparency effective in the workplace? Is the information, the time, the format, the presentation or the frequency?**
   - **Rationale:** this question in order to know the important constructs of transparency. Is the content, the way of presenting the information, the time of revealing the information? The answers will help in shorten the findings that will be used in the modelling language.
3. **What are the positive and negative effects of adopting transparency in the workplace? How do you explain the relationship between transparency and motivation in the workplace?**
   - **Rationale:** this question is meant to understand the positive and negative sides of transparency particularly from motivation perspective. The answers will help in connecting transparency with motivation and concepts between them e.g., awareness, Informed decision making.
4. **Transparency creates a knowledge- based workspace by making information about the employees and their activities visible within work environment,**
   - **Rationale:** this question is asked to explore when transparency can be risky or can be less beneficial. The answers will help in designing the algorithms analysis.
5. **From motivation perspective, how would the employee feels if the workplace adopt transparency features such as user profile that shows the activity that currently happing (tasks and goals in progress), Avatar that reflect your current status or mood (busy, free, in a meeting, late or happy), Task\Goal status which shows to an employee, and perhaps other employees, the progress of your tasks or goal, e.g. the current task is active and 40% has been done, this goal is inactive now. How would all these effect the motivation between employees in the workplace?**
   - **Rationale:** Starting from this question, the questions will focus more about how transparency can motivate colleagues in the workplace. In this question the focus will be about how the information transparency affects the motivation, the focus is more about the content or the kind of information.
6. **In terms of the content, Information revealed by employee to peers in the workplace can be taken in different views and it may not express the intention. It can be misinterpreted or give wrong impression. What do you think the attributes that determine the quality of the transparent content? How these attributes can affect the relationship between employees in the workplace?**

- **Rationale:** this question is to investigate how employee can express their own intention, is the intention can be expressed differently based on the other relationships. For example, peers in the same department, *acquaintance* in different departments or manager.

7. **We found in our previous study that the acceptance and usefulness of information is important to enhance the incentive effect of transparency. For example, presenting the information in a way that is understandable to the recipients will help in their decision making. From presentation perspective, to what extent do you think that presentation of information has a role in the relationship between transparency and motivation? In another words, do you think that triggering the motivation depends on the way of presenting the information to the recipients? What is your description to the concept presentation in transparency? The level of details or format?**
   - **Rationale:** this question is to investigate what we found in the focus group study. The question will help in understanding if the presentation of the information has also played a role in the motivation. It will also help in the classifying actors based on their acceptance of the information. The answers will be used in the analysis algorithms to test the alternatives and extract the optimal transparency requirements.

8. **In the literature of transparency, they claim that information quality is important to reach transparency. They mentioned that timeliness is one of the information quality dimensions to reach transparency. In your opinion, how the time dimension of transparency effects the motivation in the workplace? When transparency be effective on triggering motivation amongst colleagues**
   - **Rationale:** this question also will help in building the analysis algorithms where the time dimension will be taken into account when extracting the transparency requirements. In this question will elaborate more what people think of the time of revealing the information.

9. **If we think of information transparency in workplace, motivation can be used to enhance the collaboration between organisation members. How do you think transparency can help in motivating members to collaborate? Can you give me examples of what would be the information that motivate individual to collaborate?**

   Rationale: This question will help the participants to put everything together. I will summarize the opinions of how transparency can be a requirement for motivation. The participant may connect all the previous questions together to provide overall opinions about the topic.

10. **Do you think that information transparency will be different based on the relationship in the workplace (top-down or bottom-up)?**

    Rationale: This question is asked in order to understand how transparency can differ based on the dependency relationship. The answers will help in the reasoning of the analysis algorithms which will be taking into account when extracting transparency requirements.

11. **In my previous study, I found the following list of task characteristics, how transparency of these characteristics would affect motivation?**

    - Task/Goal status (in progress or idle)
    - Task/Goal priority
    - Task/Goal Duration (short term or long term)
    - Task/Goal dependency
    - Resources availability
    - Agent capability
    - Agent skills

Page | 265

11.3.4   EXAMPLE OF TRANSCRIPTED INTERVIEW

Goal – Risk – Risk Factor – Context - Quality – Content – Way of contact

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I am mechanical engineering, My last 15 years I was working in marketing consumer in sites and communication related projects. I was part of organisations then I set up my own consultancy firm. Then the organisation sites shranked a lot and became very small. now I try to back to corporate world, I like it better.

What was your role in your previous work, you were within a team or leader of a team.

yes, I've been always working in teams, **playing different roles** like leader of the team or a member.

Have you ever practice voluntary transparency in you work, share information with your team.

yes, there was a time I had **two bosses** and each one had **different requests** of course they want everything for yesterday so it was like wait **I have two different requests both are very urgent and I am only one in that.** So I was always very straight forward like wait I have also this request from other boss and he also want this thing right now so, **which one is more important, which one should I choose first**. They were very happy about my transparency because most people afraid of telling so they just carry all the burden themselves. I was like you know what I can't do both things at the same time, why don't you agree **which one very important for the company** and then you told me which one I should deal with first. Also when you work in **different projects at the same time so you part of different teams** and not everybody knows **how busy you are and other things you are doing. So they think you are just %100 dedicated to whatever you work with them.** So I am straight forward and transparent in everything also in my work environment for example if my daughter is sick I just tell my boss to be patient with me because I had a bad night, my daughter coughed all night so I didn't have a good sleep. so let's go slowly today.

Do they consider these circumstances and excuse you?

Actually I shared it because I want to feel safe

Did you ever feel unsafe of sharing information that may cause a problem with your manager or colleagues?

for example, if I depressed because I had a bad argument with my husband, I am pretty sure I am not going to share that but I might say **sorry I am not in a good mood.**

If this argument affect your work and cause a delay, are you going to share this information with others?

well, not with everybody but only with my boss. For example **if I have a deadline for** a report and I am really concern about something different from work but I have something to do I may go to my boss and tell him I have to give you the report today can we change the deadline for something, I think this is how life works better because sometimes you drown yourself in a glass of water while things can work easy.

Is that because you already know that your bosses are flexible with report deadlines?

I had different types of bosses but I think everybody **value honesty and if you think you are not capable of**, at the end, it is not a matter of proving you are a super hero. it is just a matter of delivering value for the company so it is better to delay or extend the deadline for one day and have better report and better analysis. Sometimes you don't have this flexibility imagine that your mum passed away. It is true the show has to go on and you have to deal with it but if you speak up you may find someone that say you know I can handle it and take your time and you are not in the right condition to make this analysis or report. I always speak up my mind.

What are the positive and the negative sides of speaking up your mind?

The positive side is creating empathy because sometimes there are people with the same struggle and sometimes you don't have times for jokes and you are so busy and when someone is sharing jokes and you are not answering, we had one like internal chat for the company and yes your status show you are online but you don't have time because you are working on a report. Some people do not regard don't disturb status. The negative side is when people will know your weaknesses and they can use this against you. Of course you cannot overload the system with (sorry I concern about something at home) because then if really that **affecting your performance at work** will then you might want to reconsider if you suitable for that role or if you need to change responsibilities. you need to be careful how much information you share. you don't need to share details.

Would you like to share information about your goals or task related to your role? How can you see the positive of that?

that could be something new for me. I use Instagram a lot and I share **my progress** posture and I find people who encourage me to keep trying and keep working on. It is good to have people cheering you up to keep trying. my type of work I have to do research and then the analysis of interviews and focus groups and prepare the report and then translate the insights into actions on market strategies. if I have to take the time to set up in a platform all the stages, if it is easy then probably I will do it but if it takes time then I will skip it and I may share the final results. I may write focus group day in the status of that internal chat as I told you before to show that I am really busy today and don not disturb me. Really if it is easy to share like **one more focus group to go and I am done, that will be nice.** Also that may allow other to collaborate in the focus group if they are available to help you or give people who they want to contact you to know exactly when you will be free. We have the same thing in the calendar, if we check the calendar of our peers, we found that they are **busy in this time** but we sometimes do not know **what they are busy about** or is he **in the campus or not**. In some cases, I may need to know this kind of information to decide for example, if I want to see him, I prefer to know if he is around me or far away to be reached.

How can you describe the relationship between transparency and motivation in the workplace?

In terms of work progress, if you work in project and you keep sharing information **like I am doing new dynamic in the focus group and you share that then people** when they know that they may come to you and **ask you about it like how it was** and **do you think it will work for this** situation. I think it is important in the organisation not just to deliver resource in terms of project but also to grow organisation and try to build expertise and to innovate together. You don't have to reinvent warm water because someone already did. if you see someone work in new methodology, then will motivate people who see that this methodology could work in their project. if you are the first one of doing something and you see someone else use it after that also rewarding for you and motivating you. I had that opportunity in my research, I was working on anti-flu medicine, you cannot interview people who already sick and it was really challenging in understand how people feel when they are having a cold and flu beyond your feel when you are sick but you know you are not the typical consumer. So, I set up a new methodology. I made like a questionnaire but it was very short, only five questions asking people who they just starting a cold and to take recorder and questionnaire, they have to answer that at least three times a day until the cold is over. It was amazing and super.

Someone from Switzerland saw my report and call me asking How you did this research and I was happy that she knew my research and that motivate me a lot to be creative and not to be afraid of scroll it up. Sometimes, to have success you have to fail. It is good to make people know about what you are doing because you may get advises and people may like what you are doing and reapplied it.

11.3.5   EXAMPLE OF EXTRACTED THEMES

First stage of thematic analysis:

Participant	Content	Quality	Goal of transparency	Risk	Risk Factor
P4	- Assigned roles - assigned task - task priority - workload -Deadline status (strict or flexible) - work progress - planned tasks - current status (e.g., focus group day or one session to go) - Location -Progress percentage (70% achieved) -Skills - Professional information or technical information - background - previous projects - mood - resource shortage - regular updates	-Use Common language - Relevance - Timely	-Awareness of potential change -work development -Provide help -creating empathy - reduce disturbance - seek encouragement - encourage to collaborate -Learn from others -increase creativity - awareness of upcoming events - find resources (actor with special skills or needed interest) - tracking mechanism - leave good impression - maximise the efficiency of the team - promoting the identity (showing relations, skills, history of jobs)	- Abuse - Information overload - Change responsibilities - Negative competition - Bias - Staff clustering -Misunderstanding - Employees demotivation - Depression - Peer comparison	-irrelvant information - lack of transparency of task status - Transparency of progress - Early transparecny of bad news - Transparency of employee ability -

Second stage of thematic analysis:

Information Cues	Quote
Work Capacity	"knowing the work plan for someone is really effective in encouraging people to decide to engage with him in project, he may has so many works to do and he may delegate extra tasks to me if we are in the same project" **P8**
Number of redoing opportunities	" If we tell the customer that he has two chances to refund any purchases from google play store then he may buy a lot of app in the first and second time then he asks for refund and not buy anything after " **P1**
Task type	**Assessment task:** "I work on assessment task and I do not share the result of the assessment now. it might be too early to be open about the result to not cause any problem with colleagues" **P2** **Coding task:** "I worked in projects related to medical robotic model, before accepting this project I told them that I will work in the coding part" **P6**
Location	"my colleagues should know whether I am in the same site with them or I am doing job in the field site, because they may cover my hours but they are not aware that I am working as well" **P10**
Obstacles	"If I have such kind of profile I can see what my colleague is stuck with may be something that I just have a cross with it before then I can help her by sending her email showing her the way that I solve the same situation." **P12**
Goal or task duration (long term or short term)	"I think also we need to understand what are their long term goals because they aimed to get to here including them in this information my give them the motivation and the drive to strive for that " **P7**
Size of the group in collective tasks	"In the case of collaborative work, it is important to know how many people will be in that group and are they qualified enough in their fields. I think the more qualified mean they are experts in what they are doing which make the project move smoothly" **P11**
Potential delays	"I think the calls of the delay should be shared because everyone should know about it and understand what the reason is." **P3**
Number of related achievements	"Personally, I feel closer to the person that show how much his achievements and how much work he did. For example, I work in medical analysis robotics and I am concern of the achievements of other members in the team that related to my fields. This kind of information cause what I may call confidence" **P15**

Third Stage of thematic analysis

Category	Risk Factor	Risks	Examples
Goal Related risk factors	Goals Priority	Conflict of goals Stress Lack of commitment	**Conflict of goals** may happen due to <u>lack of transparency</u> about goal priority. For example, a mechanical engineer works in two different projects with two different teams. Both teams have high priority for their goals but they do not share this priority with the engineer and they expect the engineer to dedicate all the time for their work. This may cause a conflict of goals to the engineer as he is not aware of the goal priority and he may work in one goal more than the other. Similarly, <u>transparency of goal priority</u> also has a risk of **misunderstanding** and **disappointing** from peers who are collaborate in the same goal. For example, if project leader gives high priority to individual goals and make it visible to the project team then it may create **stress** to project members who have collaborative goals with him \her. It may also make them **less committed** to the project.

Participant Information Sheet

The title of the research project

Assessing Online Social Transparency in Enterprise Information Systems

Invitation

You are being invited to consider taking part in this research study. This research conducted by Tahani Alsaedi a PhD student in the Department of Computing and Informatics at Bournemouth University.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully and discuss it with friends and relatives if you wish. Ask us if there is anything that is unclear or if you would like more information.

What is the purpose of the project?

The aim of this research is to propose a method to assess online social transparency in the enterprise information systems. The assessment method will help requirements engineers and system analysts in the decision-making process to identify and assess the risks of social transparency that may affect the individual and organisational productivity.

Why have I been invited to take part?

You have been invited because of your background and experience as users or experts of information systems. You have been invited because we think that you can comment and give feedback on the problem space of the research topic and the possible solutions to incorporate transparency in requirements engineering.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a participant agreement form. Also, you may need to provide your email address to allow the researcher to contact you for any further clarifications regarding the study if necessary. You will not be identified or identifiable in the outputs that result from the research and the email address will be removed after the data are collected and transcribed so that the data will become totally anonymous. You can withdraw at any time, up to the point where the data are processed and become anonymous, so your identity cannot be determined, without affecting any benefits that you are entitled to in any way. You do not have to give a reason. Deciding to take part or not will not adversely affect you.

What would taking part involve?

As a participant in this project, there will be some activities to undertake. Firstly, the researcher will ask to get permissions to observe your group's interactions vis enterprise social software. This is to help me understanding

how socially transparent employees might have affect in the wellbeing and productivity of their colleagues. In the next stage, you will be asked to participate in a focus group session to discuss

the findings of the observation stage. This session could be held as cards sorting session to produce a classification of the identified risks of online social transparency.

What are the advantages and possible disadvantages or risks of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will improve our understanding of eliciting transparency requirements that used to motivate cooperation in information systems. There are not speculated risks of taking part of this study.

Will my taking part in this study be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications. All data relating to this study will be kept for five years on a BU password protected secure network.

Will I be recorded, and how will the recorded media be used?

Yes, you will be recorded if you take part in the focus group. The recording will help the research team to capture the information that will be sought from you during the focus group. However, you will be given the right to accept or reject recording the session. No other use will be made of the recording without your written permission, and no one outside the research team will be allowed access to the original recordings. The audio recordings made during this research will be deleted once transcribed and anonymised. The transcription will not include your name or any identifiable information. Instead, each person will be identified by their code (i.e. #id523741, #id523753, etc.).

Contact for further information
If you have any queries about this research, please contact me using the following contact details:
  Tahani Alsaedi
  E-mail: Talsaedi@bournemouth.ac.uk
  Bournemouth University, Faculty of Science and Technology
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Thank you for taking the time to read this information sheet, and please do not hesitate to contact me if you have any queries.

Participant Consent Form

Study Title: Assessing online social transparency in Organisational Information Systems

Researcher Information

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Please initial here

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I confirm that I have had the opportunity to ask questions.	
I understand that my participation is voluntary.	
I understand that I am free to withdraw up to the point where the data are processed and become anonymous, so my identity cannot be determined.	
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Should I not wish to answer any particular question(s) or complete a test, I am free to decline.	
I give my permission for members of the research team to have access to my anonymised responses. I understand that my name and email address will not be linked with the research materials and I will not be identified or identifiable in the outputs that result from the research.	
I understand that taking part in the research may include being recorded (audio) but these recordings will be deleted once transcribed and anonymised.	
I agree to take part in the above research project.	

Name or Initials of the Participant   Date   Signature

Observation Form

Date: **Observed online platform:**

Time:

Context	Observations
Content	**Observed Content:** - Sharing Jira code in public channel without informing collaborators may create embarrassment to them. - Sharing links for personal blogs in project channel creates information overload - Sharing new social events in project channel can be seen as less consideration of the channel main purposes - when employees are transparent about their interest in certain tasks, other members may be less motivated to work hard on behalf of the group - Employees share their personal skills in solving certain problems either to promote their abilities or to make others learn from them may reduce the innovation and creativity of other employees - Sharing intentional postponing of a task for personal circumstances may make others to postpone their work as well. - Staff feel annoyed of receiving irrelevant information - No transparency about interest in performing collaborative tasks make them think carefully before engaging in this task - pin certain messages to appear all the time to all team members as a headline or priority such as long duration tasks may make colleagues lose their interest to con-tribute or collaborate in this task
Timeliness	**Time dimension** - Share funny photos in the middle of project discussion - Sharing information too late and after starting performing the task - Add long details in conversation forum - Some team members share sudden software uninstallation after starting the project - Stress and pressure resulted from transparency when the information reveals conflict with other member's interest or works
Presentation	**Presentation dimension** - Information shared about project documentation was not enough - Share Jira code with staff who has no knowledge about Jira can make the others feel less skilled or lowering their self esteem - Transparency of difficult to understand information may reduce the interest in collaboration - a high volume of information may cost the employee lots of time and effort to search for relevant information

Staff relationships	**Relationship** - Unjustifiable decision due to special relationship with managers - Friends or relatives - Unaware of peers' interest and preferences can cause relationship conflict and misattribute the intentions of others - Less feel of belonging due to lack of transparency between peers in the same team
Staff dependency	**Dependency** - Transparency about interest with Team members who work on the same task - unawareness of the work status may create stress for employees who depend on these work - A team leader depends on a member to write a report but that member shared that the currently active task involves designing a prototype, the leader delegates the report to the workload of another member. - Enterprise software do not show the identity of the person who depends on certain task therefore, that may cause less commitment to the assigned jobs.
Further observed context	**Observed action** - We noted that staff may avoid collaboration with colleagues who practice transparency more than normal - Misplacing information to the right channel may lead to information overload of irrelevant information - *"I may receive information that I do not need to know but because it is sent to me, I feel like it is something I am expected to part of, or to understand"* - Too much transparency might create confusion about colleagues' intention, which may create a chance of making mistakes and waste time in the workplace. - transparency with staff who are not transparent - too much transparency means unneccesary distraction and make the workplace an unhealthy and uncomfortable environment for employees who may lose concentration to finish their work - too much information make employee process too much information - Some employees are open about personal life more than work - Employee fails to know about other's intentions may create a conflict in performing these tasks and spend significant time in the least priority tasks. - Face to face clarification of the shared information in the group channel to eliminate any misunderstanding to important people - Lack of social transparency amongst employees may result in the occurrence of rumours, biased opinions, fabricated reactions - When there is no social transparency, it would be difficult for employees to know what is going on, why certain things are happening, and they may find themselves vulnerable, insecure and afraid of uncertainty. - Lack of collaboration amongst employees who are not transparent or less transparent about their information at the time others are transparent. - Inequivalent transparency between members cause insufficient knowledge base - Individuals may use others' information as a way to empower themselves or misuse the information for personal benefits - People may not expect or want reciprocal transparency as a return to being transparent

	- Symmetrical social transparency can create a massive information history in the online plat-form, which may cost the employee time and effort to search for relevant information - Employees would be socially transparent when their colleagues are transparent as well. If the other party continually fails to be transparent, other employees will stop being transparent with them - Equal transparency can add pressure on employees to avoid losing transparency of others.

11.4.3.2   SHORT INTERVIEW QUESTIONS

Please answer the following questions if you find that someone voluntarily share information about his/her own activities.

Q1: From you understanding of social transparency, have you experienced this transparency recently from one of your colleagues or other organisational members?

Yes, it just happened this morning.

Q2: What is the software that used for social networking?

□ Email

□ Calendar

□ Slack ✓

□ Workplace by Facebook

□Yammer

□Other: …………………………………………………………………………………………

Q3: What was the information that he/she was transparent about?

He/she share about new upcoming technology and anything new in technology world.………

Q4: How can you describe your feeling when you received the information from your colleague?

I feel motivated as there is something new to learn but sometime I also bit anxious.

Q5: What was the problem that causes these feelings? Please describe it as short story

I feel motivated because only because of such information, it might help me in the work. However, Sometime I feel anxious because that makes me feel that I still have very long way to go and thus must work hard, despite of already giving much effort.

Q6: The following questions will be used to identify individual requirements of social transparency.

1- **Who do you want to be transparent?**
   I want people to be transparent if he/she received help from someone. and help can be is any sense.

2- **What is the information that he/ she should be transparent about?**
   He/she should share about expertise a person has so that others can seek help if he/she requires.

3- **When do you want him / her to be transparent about this information?**

The perfect timing would be during lunch time when its perfect time to have a chat about it. And also if we have dedicated channels so that only the interested people can see it.

4- How the information should be look like when you receive them?
5- Simple 1-2 lines with names and entity hyperlinked for quick clicks. Also the best time that person should be contacted.

6- Why do you want him/her to be transparent? Do you experience any bad feelings?
  1. I want he/she to be transparent because two things will happen with this.
     a. The person who has helped will get some recognition and so will inspire him to help others as well.
     b. It might be helpful for someone who is stuck in the same task.

11.4.4   EXAMPLES OF SOCIAL TRANSPARENCY OBSERVED IN SOCIAL SOFTAWRE
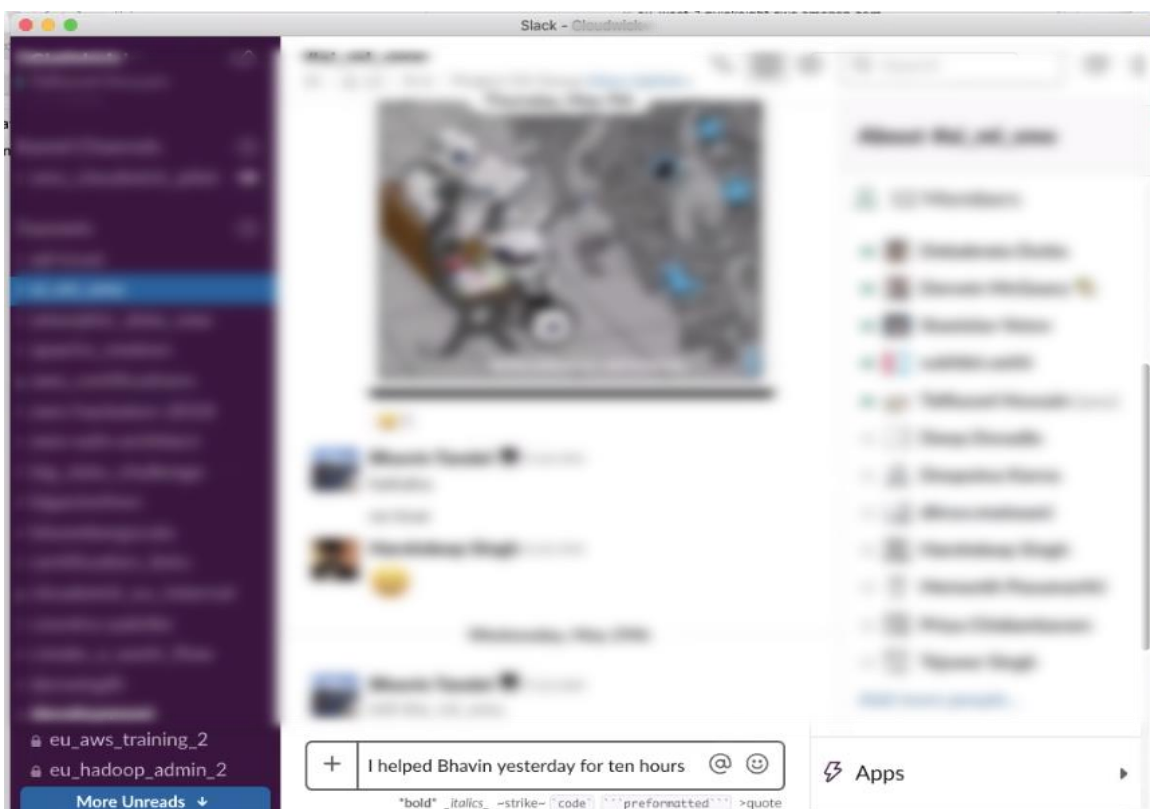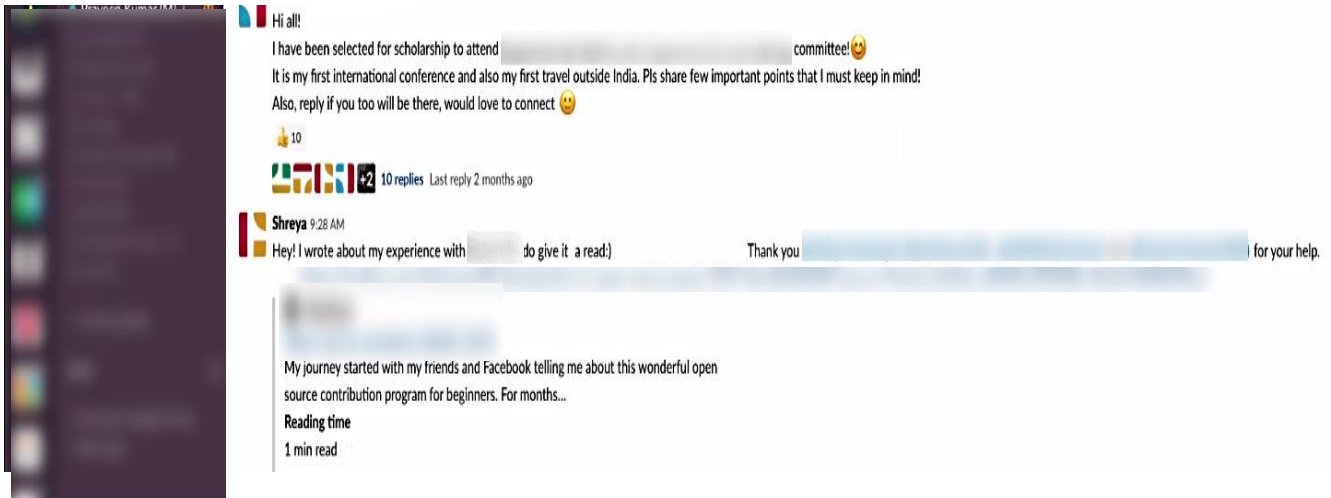
Scenarios on research problem

A software development company has a mission to develop security system for a university.   A team of developers and system engineers has been gathered to complete this mission. The team includes team leader, developers, system analysts and system testers. Each member in the team has specific goals and tasks to be complete in certain time. For this reason, they suggested to use one of the collaborative software to track their performance and to provide help if needed by someone in the team. The software has basic features that allow members to share their status, work progress and public conversation with all members. The team has not been informed what they should\ shouldn't share in these features.

Scenario 1: Mark (Developer) usually uses the status feature to describe his current work or to inform his colleagues if he is busy. One of the posts on his status was "**coding is tough**" the post was visible to all team members. The status showed others that he is currently working on the code of the software. His team knows that he is capable of doing the task but they think that he currently does not want any interruptions. However, the status was not clear to the team leader. He was expecting Mark to finish the coding by the end of the week because the project should be delivered within three weeks. However, when he saw Mark's status, he thought that Mark was not capable of finishing the task on time and then he decided to delegate the task to someone who was more competent.
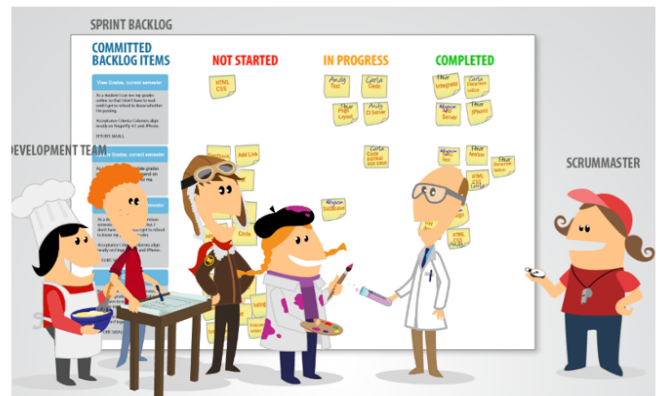
Scenario 2

A team leader offer extra credit for each member in the development team who finish his work with less defects. He did that to encourage member to work better and to avoid the appearance of defects in the production phase which will be a big loss for the whole company and they may loose customers trust. Simon is a developer who finished his coding part and sent it to the testing team to check for any defects.

The collaborative software that they use to track team progress does not present precisely the work progress of each individual. Simon Knows who is working on his code but he does not receive any information about the testing process which made him feel stressed because his code should work correctly without any errors. His concerns comes from reporting any critical defects by testing team.

Then he will loose the opportunity to gain the extra credit that offered by the team leader. Emma is the tester who works on Mark's code. She was working on Mark's code and other test cases that need to be finished in two days. She paid more attention to the test cases that need to be report soon. So, she just showed in her progress bar that she just started the testing on Mark's code. But the progress bar has not changed for three days which made Simon feel more stressed.

11.4.5.2   SESSION PHOTOS

- **Identification of risk factors**

- **Identification of risks**

Bournemouth University

Participant Information Sheet

The title of the research project

Assessing Online Social Transparency in Enterprise Information Systems
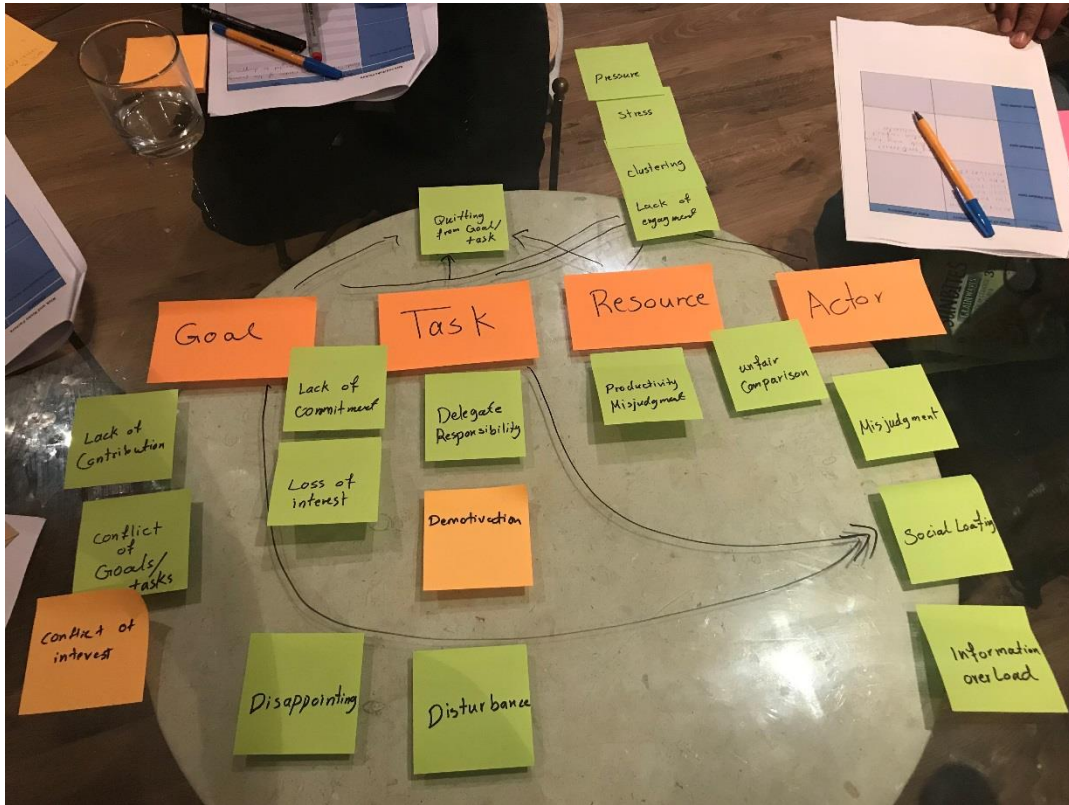
Invitation

You are being invited to consider taking part in this research study. This research conducted by Tahani Alsaedi a PhD student in the Department of Computing and Informatics at Bournemouth University.

Before you decide whether or not you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully and discuss it with friends and relatives if you wish. Ask us if there is anything that is unclear or if you would like more information.

What is the purpose of the project?

The aim of this research is to propose a method to assess online social transparency in the enterprise information systems. The assessment method will help requirements engineers and system analysts in the decision-making process to identify and assess the risks of social transparency that may affect the individual and organisational productivity.

Why have I been invited to take part?

You have been invited because of your background and experience as users or experts of information systems. You have been invited because we think that you can comment and give feedback on the problem space of the research topic and the possible solutions to incorporate transparency in requirements engineering.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a participant agreement form. Also, you may need to provide your email address to allow the researcher to contact you for any further clarifications regarding the study if necessary. You will not be identified or identifiable in the outputs that result from the research and the email address will be removed after the data are collected and transcribed so that the data will become totally anonymous. You can withdraw at any time, up to the point where the data are processed and become anonymous, so your identity cannot be determined, without affecting any benefits that you are entitled to in any way. You do not have to give a reason. Deciding to take part or not will not adversely affect you.

What would taking part involve?

You will be asked to participate in an evaluation session to evaluate the proposed assessment method. This session include several activities:

Induction session: to introduce the research problem and the proposed assessment method for this problem.

Individual activity: Employees will be asked to evaluate the usability of the observation sheet individually.

Group activity: System analysts and managers will be asked to evaluate the usability, effectiveness and helpfulness of the proposed assessment method and the supporting tool.

What are the advantages and possible disadvantages or risks of taking part?

Whilst there are no immediate benefits for those people participating in the project, it is hoped that this work will improve our understanding of eliciting transparency requirements that used to motivate cooperation in information systems. There are not speculated risks of taking part of this study.

Will my taking part in this study be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential. You will not be able to be identified in any reports or publications. All data relating to this study will be kept for five years on a BU password protected secure network.

Will I be recorded, and how will the recorded media be used?

Yes, you will be recorded if you take part in the evaluation stage. The recording will help the research team to capture the information that will be sought from you during the session. However, you will be given the right to accept or reject recording the session. No other use will be made of the recording without your written permission, and no one outside the research team will be allowed access to the original recordings. The audio recordings made during this research will be deleted once transcribed and anonymised. The transcription will not include your name or any identifiable information. Instead, each person will be identified by their code (i.e. #id523741, #id523753, etc.).

Contact for further information
If you have any queries about this research, please contact me using the following contact details:
 Tahani Alsaedi
 E-mail: Talsaedi@bournemouth.ac.uk
 Bournemouth University, Faculty of Science and Technology
 Talbot Campus, Fern Barrow, Poole, BH12 5BB, Tel: 01202 968140

Complaints
If you have any complaints about this project please contact Professor Tiantian Zhang, Deputy Dean for Research and Professional Practice of the Faculty of Science and Technology at Bournemouth University at the following address:
Professor Tiantian Zhang
E-mail: researchgovernance@bournemouth.ac.uk
Bournemouth University, Faculty of Science and Technology
Talbot Campus, Fern Barrow, Poole, BH12 5BB, Tel: 01202 965721

Thank you for taking the time to read this information sheet, and please do not hesitate to contact me if you have any queries.

Participant Consent Form

Study Title: Assessing online social transparency in Organisational Information Systems

Researcher Information

Tahani Alsaedi (Talsaedi@bournemouth.ac.uk)

Faculty of Science & Technology
Bournemouth University

Supervisor Information

Dr. Raian Ali (rali@bournemouth.ac.uk)
Faculty of Science & Technology
Bournemouth University

Please initial here

I have read and understood the participant information sheet for the above research project.	
I confirm that I have had the opportunity to ask questions.	
I understand that my participation is voluntary.	
I understand that I am free to withdraw up to the point where the data are processed and become anonymous, so my identity cannot be determined.	
During the tasks of the study, I am free to withdraw without giving a reason and without there being any negative consequences.	
Should I not wish to answer any particular question(s) or complete a test, I am free to decline.	
I give my permission for members of the research team to have access to my anonymised responses. I understand that my name and email address will not be linked with the research materials and I will not be identified or identifiable in the outputs that result from the research.	
I understand that taking part in the research may include being recorded (audio) but these recordings will be deleted once transcribed and anonymised.	
I agree to take part in the above research project.	

Name or Initials of the Participant   Date   Signature

Prior Knowledge:

1- What is your current occupation?
2- How much experience do you have in…   • System engineering: • Business analysis:
3- Which of the following indicates how much you know about detecting risks in enterprise information systems?   ( ) I don't know anything about that   ( ) I know a little, but I could learn more   ( ) I am an expert

Existing Approach:

1- How often do you detect the risks of social behaviour in the workplace?
2- When was the last time you engaged in risk analysis tasks?
3- What tools do you use, if any, to help with this task?
4- Please describe your experience with this tool.

Usability Test questions

Questions
1- How did you find the using of (1. The approach   2. The tool)?
2- How did you find the layout of the content (1. The approach   2. The tool)?
3- How did you find the amount of the content on (1. The approach   2. The tool)?

4- What did you like the most from the analysis tool? Why?
5- What did you like the least from the analysis tool? Why?
6- How did you find the approach and the tool in answering your questions?
7- How did you find the approach and the tool in detecting risks of online social transparency?
8- What are the benefits that you obtained from the approach and the tool?
9- How did you find the use of the tool in identifying the risk of online social transparency?
10- How did you find the helpfulness of the tool in the planning of mitigation process of the identified risks?
11- What are the analysis techniques that can be extracted from the tool? For example, Cause and Effect Analysis, Decision Tree Analysis.

Further suggestions and comments:

………

………

………

Course Lecturer

- Course Lecturers first get involved when they are allocated to a subject by the timetabler.
- Course Lecturers are responsible for setting the Course objectives and course outline.
- Accordingly, they prepare the course lectures week by week to cover the planned outline.
- Course Lecturers are responsible for setting all course examinations (7th week exam, 12th week exam, and final exam) and marking them.
- After marking 7th and 12th week exams the marks and papers are shown to students for feedback and collected again.
- For the final examination. Once the paper is written and moderated (we shall ignore the moderation process for simplicity) the paper is sent to the Examinations Office who organize the time and place of the examination, arrange for the exam to be invigilated and then return the completed scripts to the Course Lecturer, who then marks the scripts and records the marks.
- At the end of the year the Subject Tutor must calculate a final coursework mark for each student and pass a copy of these to the Head of Department.

The Teaching Assistant (TA)

- TAs first get involved when they are allocated to a subject by the timetabler.
- TAs are responsible for setting the sections' materials according to the course outline discussed with the course lecturer.
- TAs are responsible for setting assignments and giving them to students. The student completes the assignment and returns it to the TA.
- They are then marked, the marks recorded and the assignments returned to the students with feedback.
- TAs are also responsible for setting short quizzes before assessment milestones (7th week, 12th week, and 15th week), which are also marked, recorded and sent to the course lecturer.
- TAs also assist in managerial tasks such as time tabling, exams invigilation, and collecting samples for quality assurance unit.
- TAs are academic advisors for several students. For each student they prepare a file with student's contact information, the course plan indicating the subjects that he/she finished and the remaining courses. Also they keep record of an updated transcript. All these documents are used each semester during the registration task.

The Head of Department (HOD)

- The HOD is considered the head of timetabling committee. He is responsible of distributing the course loads on lecturers and TAs.
- He is responsible for recruiting external lecturers to fulfill the load needs.
- He contacts Lecturers to collect time preferences and sends all the above information to the TA assisting in the time tabling for scheduling.

- He is also considered the head of academic advising committee. In collaboration with the academic advisors (TAs), he monitors the advising of students and resolves any conflicts and issues during the registration period.
- The HOD is also considered the head of exams committee. A TA assists in the scheduling of the final examinations. The HOD revises that schedule t ensure there are no conflicts.
- He also approves the invigilation schedules assigned for each employee in the college.
- He is also responsible for the final gathering of marks for presentation to the college Dean.
- The HOD analyzes the end-of-year marks for all subjects through the web portal to ensure that there is no inflation/deflation in the marks. Any concerns are discussed with course lecturer for corrective actions.
- Along the term any student mitigations and evidences are collected through the HOD. These mitigations and evidences are passed to the course lecturers for an action to be taken.

The College Dean

- When the college dean receives the results from the HOD, he produces a pass list which is then passed to the educational vice president for approval and announcement on the students' web portal.
- College dean also gets feedback from college vice deans, HODs, and Head of QA of all ongoing process and updates.
- Progress and issues are presented and discussed every month during the college council. Decisions are recorded and must be approved by college council members in order to be out into action.

Dean's Office Director

- Manages the documentation and letters that should be received or sent through the dean's office to any other college or unit in the organization.
- She is responsible for taking meeting minutes in the college council or any other event attended by the dean.
- She produces a report for each college council containing the points discussed, the suggestions and the decisions taken.
- She collects the members' approvals and/or comments for updating the report.

Head of Quality Assurance Unit

- The Head of QA is responsible for collecting and archiving all course samples from course lecturers and course TA. Samples include marked: exams, coursework, assignments and quizzes, presentations and projects.
- These are kept in course file in the QA Unit. These files are audited by the central QA Unit in the organization. Also by accreditation bodies during the scheduled visit.
- The Head of QA unit is also responsible of collecting and archiving the QA documents from course lecturers for each course, including the course progress sheets, Statistical forms with grades distribution, course attendance sheets, printed form with all students grades, sample final examination papers

industrial ← board Dean ↑ Accreditation bodies
College member

Prior Knowledge:

1- **What is your current occupation?**
   Software Architect

2- **How much experience do you have in…**

   - **System engineering:** 12 years as a software engineer specialized in enterprise applications

   - **System analysis:**

3- **Which of the following indicates how much you know about detecting risks in enterprise information systems?**

   ( ) I don't know anything about that

   ( ) I know a little, but I could learn more

   (*) I am an expert

Existing Approach:

1- **How often do you detect the risks of social behaviour in the workplace?**

My company is considered large sized, and we tend to detect these kinds of risk as soon as they appear and we also try to solve them immediately by productive confrontations and agreements. Perhaps the seniority level has a major role in the way that we handle those risks, a junior employees probably will not poses the necessary skills to handle malicious social behaviour efficiently but we do have a kind of anonymous reporting mechanism to encourage them to report their problems.

2- **When was the last time you engaged in risk analysis tasks?**

I engage in risk analysis and mitigation tasks on weekly basis. As a senior software engineer, I engage many planning tasks such as estimation, resource planning, impact analysis, and release planning, all these tasks contain a great deal of risks.

3- **What tools do you use, if any, to help with this task?**

We use the office suite Excel, Word, and PowerPoint

4- **Please describe your experience with this tool.**

It is flexible and it allows us to freely shape our reporting and calculation techniques without any constraint.

Usability Test questions

Questions
1- How did you find the using of (1. The approach   2. The tool)? I have not used either the approach or the tool but I can give you feedback about their content. Approach: Activity 1.4, the outcome shouldn't be only the goal model but also a policy (Who are the members, how many? Roles?, How often: weekly, monthly...) document containing the rules that govern the assessment process. And perhaps it will be good to have a template for that policy. Activity 2.1, in the outcome I cannot understand how the raw observation data will be updated from the actual sheets. Activity 2.2, in the outcome I would like to see the risks categorized by severity, their reasons, their impact, and their mitigations. Perhaps it is good to have some kind of a report template that guide the analyst to filling this report. Activity 2.2, in the used materials it would be good if you provide me with the Goal-Based Risk Ranking guide. Tool: I find the dashboard expressive and useful for building an overview about observations activities as well as the used mediums. I would like to understand how the enterprise will adapt the list of activities to their domain. I would like to see a dashboard with some charts that illustrate how the risk factors related information are distributed. A bar chart for each factor will do, specially if those charts are updated based on my filters in the related information section.
2- How did you find the layout of the content (1. The approach   2. The tool)? I find the layout and the organisation style is great.
3- How did you find the amount of the content on (1. The approach   2. The tool)? The amount of content is sufficient.
4- What did you like the most from the analysis tool? Why? The dashboard for a starter and the overall filtering facets technique.

5-	**What did you like the least from the analysis tool? Why?**

The way that the risk factor related information is represented.

6-	**How did you find the approach and the tool in answering your questions?**
	They are sufficient and they have stimulated a great amount of thinking and arguments.
7-	**How did you find the approach and the tool in detecting risks of online social transparency?**
	I find that they present a process and tool for risk detection and assessment but the detection process will always be based on the saturation of employees with the concept and how the result will impact their work environment and thus increasing their efficiency. In addition, the design of activities and mapping them to risk factors during the preparation phase are essential for success of both the approach and the analysis tool.
8-	**What are the benefits that you obtained from the approach and the tool?**
	The main benefit from my point of view is the transparency and its indirect impact on productivity through the eliminations of communication problems.
9-	**How did you find the use of the tool in identifying the risk of online social transparency?**
	Easy and informative
10-	**How did you find the helpfulness of the tool in the planning of mitigation process of the identified risks?**
	It could be used in preventive policies by avoiding social media that give rise of problems
11-	**What are the analysis techniques that can be extracted from the tool?**
	Cause and effect analysis

Further suggestions and comments:

……
……

Social Transparency –Observation Sheet			

Date:

Note: **-** The observer number <u>is required</u>.   - Information related to observer's and observee's identity <u>is optional</u>

Observer Information	**Observee Information**
Number:	Role:
Role:	Department:
Department: Team:	Team:

Instructions:

10) Describe the information observed and identify whether it is shared or missed in the online platform
11) Record (√) in the column **Yes** if the action is observed; **No** if the action is not observed
12) Describe your concern and the reasons in the **Comments** section
13) Activity refers to **tasks** you perform or **goals** you work to accomplish
14) Record (√) in the column **DAO** if you **D**iscussed the **A**ction with the **O**bservee.
15) Determine in **CL** your **C**oncern **L**evel (**L:** low - **M:** medium - **H:** high)

Briefly describe the action observed

……
……....

Impact on (wellbeing- performance- workplace environment)

What is the impact of observee's transparency behaviour?

....

Information Type: □Technical   □ Social   □Role-based   □ Goal/Task-based   □Resource-based

Online Platform:
……..

Online Platform Feature:

……

	Yes/ No	**Comments**	DAO	CL
F. Content of Transparency				
4. The information was revealed		In a form of (text - picture – audio – video - special text e.g., programming code) About:		
5. The information was relevant		Relevant to: How?		
6. The information was accessible		Accessible issue:		

Page | 292

G. Time of Transparency				
4. The information was provided before activity/Goal		Activity (task/goal):		
5. The information was provided during activity/Goal		Activity (task/goal):		
6. The information was provided after activity/Goal		Activity (task/goal):		
7. The information was provided instantly				
8. The information was provided frequently				
9. The information was up to date				
H. Presentation of Transparency				
5. The information was sufficient		In (quantity – details – quality)		
6. The information was readable/browsable		In terms of (language – written content – resolution – others)		
7. The information was easy to understand		In terms of (language – written content – drawing content – others)		
8. The information matched recipient's requirements		What are the requirements?		
I. Observer and Observee Relationship				
4. Dependency to achieve goal /task		Dependency:		
5. Collaboration in certain goal/ task		Collaboration as (team – individual volunteering)		
6. Located in the same workplace				
7. Located in separate workplace				
J. Transparency Sharing Practice				
2. Equal transparency				

What suggestions do you have for minimising concerns about observed transparency?

……

……

Action needed? □ Yes   □ No

What was done? ……………………………………….................... **Issue resolved?** □ Yes   □ No

Social Transparency – Definitions	
Observer and Observee Information:	
Observer Number	It is a unique number given to the participant instead of revealing real identity. The observer number will be used to recognise the observation provided by each person. All the observation for each person has to be held this number. For example, David chooses randomly number 123 to represent his identity. All the observations provided by Jack must include 123 as observer number.
Observer Role	Observer is the individual who provides information about undesired transparency behaviour from colleagues. Each individual must also provide the role that he/she played in the workplace. Some individuals may play more than a role in the enterprise e.g., developer might also be a team leader. observers must identify their roles at the time they filled out the observation sheet.
Observee Role	Observee is the individual who is transparent about his/her information. Observer must provide the role of the person who observed his/her transparent behaviour. For example, a developer observed transparent behaviour from a software designer. The observe role, in this case, is a software designer.
Team/Department	Observer and observe may locate in same or different teams and departments
Online Platform	It refers to the online software where the observer notices the undesired transparency from colleagues. It represents different kinds of online software that employ for communication purposes amongst staff such as Email, Enterprise Social Software such as Slack, Yammer, Facebook.
Online Platform Feature	It refers to the part of the online platform that used for practicing transparency. For example, auto-reply feature in Email, group channel in Slack, user profile in Enterprise Website, Direct messages on Facebook.
Information Type	It describes the actual information observed in the transparency behaviour. Social refers to the information shared for entertaining purposes such as advertising for certain events or photos of work-related comics. Technical is information related to software or hardware. Role-based refers to information related to the individual performance and demographics such as background, education, experience, skill, etc. Goal/Task-based refers to information that describes various properties of individual goals and tasks such as duration, interest, status, priority, dependency, etc. Resource-based refers to information describing the properties of the resources such as status, availability, accessibility, ownership, sufficiency, value, outsourcing, etc.
Observation Questions:	
A. Content of Transparency	
1. The information was revealed	This question has two cases: revealing the information and withhold the information. These cases describe the normal level of transparency and the lack of transparency. The decision to reveal the information might have concern in creating undesired clustering, social loafing or misuse of the information. Similarly, the decision of withholding information may reduce interest and create stress for staff.

2. The information was relevant	Information can be related to individual skills, experience, background, role, goals, and tasks. Relevance means the extent to which information is applicable and helpful for the task at hand. Transparency of advanced relevant information may create stress or pressure to new staff with less knowledge or experience, while transparency of irrelevant information to individual role or tasks can cause information overload.
3. The information was accessible	Accessibility can be related to: (1) human accessibility when information can be accessible by all members or specific members and (2) technical accessibility when information can be accessible from different digital platforms and devices. Accessibility by all members can cause counterproductive competition amongst them. Information can be inaccessible for members due to internet connection limitations or using different devices or online platforms. Stress may result from the inability to access information.
B. Time of Transparency	
1. The information was provided before activity	Transparency before engaging in certain activity includes information such as skills, experience, interest, background, and role responsibility. Concerns such as lack of collaboration may occur as a result of transparency about a low level of skills or background about the activity.
2. The information was provided during activity	During performing an activity, transparency includes information about resources' shortcomings and shortage. Lack of transparency or late transparency about this information may cause delay in the progress.
3. The information was provided after activity	Transparency after a completed activity may be practiced for learning and improvement purposes, such as voluntary feedback, performance clarification, and activity shortness. Late transparency or lack of transparency after an activity may reduce motivation, create a bad impression, or result in misjudgement between peers.
4. The information was provided instantly	Online platforms make transparency to be practiced instantly and in real-time manners. Distraction may result from excessive instant transparency, while loss of interest may stem from the late transparency of information that is needed instantly.
5. The information was provided frequently	Frequency represents the number of occurrences of repeating transparency per unit of time e.g., hour, day or week. A reasonable frequency can be used as a reminder while unpleasant frequency may cause excessive transparency which may be overloading and subsequently stressing peers.
6. The information was up to date	Up to date transparency means the information is valid to the tasks or goals at hand, recently created or updated, finalised and definitive version. Transparency of outdated information may reduce the interest to contribute to collaborative work as well as reduce the trust and credibility of information sources.
C. Presentation of Transparency	
1. The information was sufficient	Information is enough and adequate to make an informed decision. Information meets receiver satisfaction. Transparency of insufficient information may delay the decision-making process and reduce the quality of coordination amongst peers.
2. The information was readable/browsable/ navigable	Information can be written text, audio, video or photos. Information is presented in appropriate font size, colours, and shapes, which make it easy to read and browse. Written content is structured in a hierarchal format, which makes it scannable and navigable. Audio, videos and photos are presented in good resolution and clean graphical implementation. poor readability scares readers from the content and slower processing the information.

3. The information was easy to understand	Information is provided in common language and concepts. The information is consistent with receivers' background, problem-solving skills, and educational levels that enable them to understand the information. The information is easy to skim and get an overview of it. Un-understandable information may cause negative feelings such as alienation, isolation and discounting others' concerns.
4. The information matched recipient's requirements	is consistent with what the receivers need and require. Receivers requirements may change based on their role, skills, ability, experience and current situation in terms of time of receiving the information, the amount of the information and the type of the information. Providing information that does not match receivers' requirements may cause delay in progress because they need time to process the information. Receivers may lose their interest in viewing information that inconsistent with their requirements.
D. Observer and Observee Relationship	
1. Dependency to achieve goal /task	It represents supervision (manager and employee) and team members' (employee to employee) relationships. The observer depends on the observee to accomplish a goal or task or to provide certain outcomes. When observees is transparent about their low interest in work, that may cause stress and pressure on peers who depend on their work. Lack of transparency about dependee identity may cause misjudgement on individual's performance.
3. Collaboration in certain goal/ task	The observer and the observe are working together to complete a task or achieve a goal. Transparency of low priority in accomplishing the task may create loss of interest to other collaborators.
4. Located in the same workplace	The observer and observee are working in the same team, office, department.
5. Located in separate workplace	The observer and the observee are working in different teams, offices, departments. This relationship also includes remote co-workers.
E. Transparency Sharing Practice	
1. Equal transparency	The observer and observee are, at a certain point of time, transparent about their information and have enough information about each other.
2. Unequal transparency	The observer is more transparent in terms of information content and, also timing and proactiveness than the observee.

Social Transparency –Observation Sheet

Date: 4-12-2019

Note: **-** The observer number <u>is required</u>.   - Information related to observer's and observee's identity <u>is optional</u>

Observer Information	**Observee Information**
Number: 5	Role:
Role: Head of Quality Assurance Unit	Department: Team:
Department: College of Computing Team: College of Computing	

Instructions:

16) This sheet should represent the observation of one case.
17) Describe the information observed and identify whether it is shared or missed in the online platform
18) Record (√) in the column **Yes** if the action is observed; **No** if the action is not observed
19) If **A1** is **Yes** then all the sentences need to be checked. if it is **No**, then jump to sections **B, D** and **E**
20) If one of **B1, B2** and **B3** is **Yes**, then the others are **No**
21) Describe your concern and the reasons in the **Comments** section
22) Activity refers to **tasks** you perform or **goals** you work to accomplish
23) Record (√) in the column **DAO** if you **D**iscussed the **A**ction with the **O**bservee.
24) Determine in **CL** your **C**oncern **L**evel (**L:** low - **M:** medium - **H:** high)

Briefly describe the action observed As the head of quality assurance unit, I am required to maintain an updated version of course outlines and templates. Each semester I distribute these templates on course lecturers for revision and receive it back for upload on the web portal. It usually takes the course lecturers some time to return them back so I keep sending reminders to ensure quick delivery. I usually send reminders in a single e-mail to all remaining course lecturers and Cc the college dean. So all lecturers can see who is still remaining from their colleagues who did not submit the templates.

Impact on (wellbeing- **performance**- workplace environment)

What is the impact/concern of observee's transparency behaviour? Accordingly, this kind of transparency leads to delaying the task more, because they keep saying "there are still others who did not submit too". They are only start working on it when there are two or three who still didn't submit, because they don't want to be last.

....

Information Type: □Technical   □ Social   □Role-based   □ **Goal/Task-based**   □Resource-based

Online Platform: e-mail

Online Platform Feature: e-mail

	Yes/No	**Comments**	**DAO**	**CL**
K. Content of Transparency				
7. The information was revealed	Yes	In a form of (**text** - picture – audio – video - special text e.g., programming code) Information was about: a reminder to course lecturers to submit templates for the courses they teach. They can see in the e-mail recipient list who did not submit the templates too.		M

8. The information was relevant	Yes	Relevant to: each course lecturer who did not submit the templates. Also, it is relevant to the dean who wants to see the submission progress. How is it relevant? It is relevant because it reminds them of a task that they are required to do.		M
9. The information was accessible	Yes	Accessible issue: I do not reveal the course names and original templates in the reminder e-mail. This is sent separately in an initial e-mail to each doctor. Elaborate more: However, as mentioned above they can see each other in the e-mail recipient list		M

L. Time of Transparency				
10. The information was provided before activity/Goal	No	Activity (task/goal): Information was (instant – frequent-up to date): Elaborate more:		M
11. The information was provided during activity/Goal	Yes	Activity (task/goal): update the course templates Information was (instant – **frequent** – up to date): Elaborate more: reminders are sent frequently immediately after the original deadline to ensure quick delivery as much as possible.		M
12. The information was provided after activity/Goal	No	Activity (task/goal): Information was (instant – frequent – up to date): Elaborate more:		M

M. Presentation of Transparency				
9. The information was sufficient	Yes	□ **In quantity** □ **In details:** □ In quality: Elaborate more: the e-mail is straight to the point as it reminds the lecturers clearly of the task. Also, it sets a new deadline for submitting the task. In some cases I mention its dependency with other tasks such as updating the web portal and that is to increase it importance and severity.		M
10. The information was readable/browsable	Yes	In terms of (**language** – **written content** – resolution – others): Elaborate more:		M

11. The information was easy to understand	Yes	In terms of (**language** – **written content** – drawing content – others): Elaborate more:		M
12. The information matched recipient's requirements	Yes	Requirements Description: update the course templates Elaborate more: The original e-mail of task assignment is sent in beginning of the semester and is sent on individual basis and with enough time to perform the task before the semester gets busy. So no need to re-mention that in the reminder e-mail again.		M

N. Observer and Observee Relationship

8. Dependency to achieve goal /task	Yes	Dependency Description: colleagues Elaborate more: as course lecturers we are colleagues. Some of them are more senior than me, as in age or experience years. However, as the head of QA unit I am required to address and monitor each and every lecturer in QA related tasks.		M
9. Collaboration in certain goal/ task	Yes	Collaboration as (team – individual volunteering) Elaborate more: We all fill in the course temples. However, it is my task individually to monitor progress, and revise templates.		M
10. Located in the same workplace	Yes	Elaborate more: We are all basically lecturers in the same college		M

O. Transparency Sharing Practice

3. Equal transparency	Yes	Elaborate more: I share needed information and resources with them to enable them to complete the task easily. When they return the templates I revise it and if there are any further concerns I share that with them for further updates.		M

11.5.9   EXAMPLE OF OBSERVATION SHEET EVALUATION

Example 1:

1- How did you find the ease of completing of the sheet?
Easy to fill the sheet, the detailed information in the comment section help me to know what should I provide. The questions were straight forward and do not require more details in the answers.
2- How did you find the language used in the sheet? For example, the terms that used in the questions.
It was ok, but some questions weren't really clear C-- 4 for example
3- How did you find the length of the sheet?
Not very lengthy. The content was reasonable.
4- Do you find any difficulties to complete the sheet? Why?
In general no, but when I couldn't understand the question I had to ask other participants in the study
5- How did you find the support information attached with the sheet?
Helpful in term of matching the structure of the sheet. It was easy to find what I was looking for.

Example 2:

1- How did you find the ease of completing of the sheet?
Easy, but in the first time, I had to ask my colleagues about some questions. The next time was easier and quicker.
2- How did you find the language used in the sheet? For example, the terms that used in the questions.
Clear and simple to understand. The definitions document help to understand some of the used words.
3- How did you find the length of the sheet?
The length is OK. However, I think that there are some redundant questions.
4- Do you find any difficulties to complete the sheet? Why?
NO, I don't. It is clear and well structured.
5- How did you find the support information attached with the sheet?
Well defined, and examples really helpful.

11.5.10   A LIST OF THE IDENTIFIED RISKS IN THE SECOND STAGE OF THE EVALUATION STUDY

Identified Risk	Information Type	Risk Factors	Online Platform	Affected employee	No. of Employees need action	Suggested action	Quote	Concern Level
1. Task quitting	Goal/Task	1. Lack of transparency about employee rights 2. The observe depend on the observer to achieve a goal 3. They work in separate workplace They are not symmetrically transparent	E-mail	Developer	Yes	none	A developer in research centre reported that *"I was about to take maternity break. The manager asked me to delay my break to perform a task but lack of transparency about the importance of this task make me quit the task. My reaction make the manager to be upset about me"*	High
2. Delay in progress	Social	1. Information has provided in text format 2. Information was not relevant 3. Information was known from another manager 4. They are collaborating in the same task	WhatsApp	Teaching assistant	Yes		TA reported that *"my colleague told me that she will travel and not finish the task on the intended due date. However, she finished the task and I haven't because I assumed it will get postponed to all of us."*	High

		5. They are members in the same team							
3. Stress	Goal/Task	1. Information has provided in text format 2. Information was not relevant 3. Information was accessible 4. Information was not sufficient 5. They are collaborating in the same task 6. They are members in the same team	WhatsApp and Facebook	Teaching assistant	No	none	TA reported that "after a bad examining day, TA wrote a negative post about students on her personal Facebook page. A colleague took a screenshot of the post and sent it to the dean. TA was taken into extensive investigation "	High
4. Information overload	Social	1. Information was provided about social occasion 2. Information provided during discussion 3. The observer and observe work in the same team	WhatsApp	Lecturer	No	none	A lecturer reported that "We have a group chat to discuss different things. We were discussing the examination schedules in the group chat and my colleague usually sent pictures or messages about events or personal occasion. I took time to back to the information that we discussed in the group"	Low

Materials of Activity 1: Assessment without the aid of the risk analysis tool and goal based analysis techniques

(Factors)

R Factors / Risk	info availability	info Relevan	info accessibility	- - - -	factors from observation sheet
Stress	✓ Yes	no	no		
Pressure	no	no			
impact on performance	✓ yes	no	no		
delay	✓ yes	✓ Yes	✓ yes		

risks

1- Risk that has High level
2- Risk that has Medium level
3- Risk that has Low level.

→ the number of employee report each level

High Risks { risk 1 ——→ 3
risk 2 ——→ 2
risk 3 ——→ 4

	risks	employees no.	total
High Concern	stress	1	} 3
	(delay)	1	
	Quitting the Job	1	
Medium Concern	(delay)	1	
Low Concern			

Materials of Activity 2: Assessment with the aid of the analysis tool and Goal based analysis techniques

1. Goal-based Risk Ranking

For each activity, the assessment team will use the analysis tool and goal model to:

1. Select the risk that needs to be ranked from the risk list.
2. Determine the activities affected by the selected risk from the activity list.
3. Select one activity at a time.
4. For each selected activity, determine the actors (observers) who perform this activity from the observer list.
5. Select one actor (observer) at a time.
6. In the goal model, determine the affected actor (observer) who perform the selected activity.
7. Check activity properties by using the risk impact checklist, presented in Table 14.
8. Rank the risks based on their impact on each activity in the risk-ranking matrix.
9. If there is more than one actor who performs the selected activity, return to step 5 to choose the next actor and check activity properties.
10. If all affected actors are checked, return to step 3 to select another activity affected by the selected risk.

➢ **Description of risks impact**

Catastrophic		The risk has a major effect on the enterprise productivity in terms of quantity and quality, and requires urgent actions. For example, lack of collaboration and engagement due to lack of transparency
High		The risk has a significant effect on the enterprise productivity in terms of quantity. For example, social loafing in collaborative tasks
Critical		The risk has a minor effect on the enterprise productivity and need action to improve the system. For example, information overload due to excessive transparency
Marginal		The risk can be avoided by individual strategy. For example, stress that stems from certain task can be avoided by trying one of the alternatives of that task

➢ Risk impact based on Activity properties

Catastrophic	- If activity has positive contribution on soft-goal/task/ goal - If activity has no alternatives - If Activity has dependency from another task/ goal/ resource - If activity is part of AND decomposition
High	- If activity has no alternatives - If Activityhas dependency from another task/ goal/ resource - If activity is part of AND decomposition
Critical	- If activity is part of OR decomposition with one alternative - If Activity has dependency from another activity/ goal/ resource - If activity has no positive contribution to another activity
Marginal	- If activity is part of OR decomposition with more than one alternatives - If activity has no dependency from another task/ goal/ resource - If activity has no positive contribution to another activity

➢ Risk Ranking Template

	Activity 1	Activity 2	Activity 3	Activity N
Risk 1				
Risk 2				
Risk 3				
Risk 4				

Risk Impact Matrix

2. Goal-Based Risk Stakeholders

Assessment team with assistance from system analysts and managers can use the ranking risk template, goal model, and risk analysis tool to create future wheel as follows:
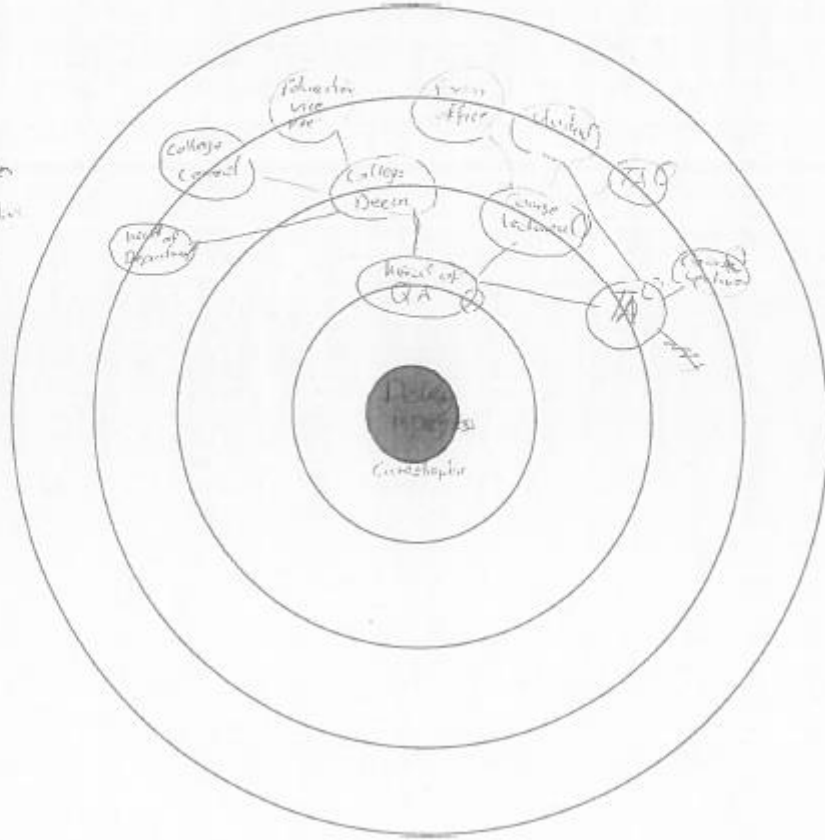
1. Select the risk that has a severe impact form the risk-ranking matrix. For example, start with risk that has Catastrophic impact

2. Identify the stakeholders of the risk by following two steps:

    a. Identify stakeholders directly from the analysis tool in case participants reveal their roles in the observation sheet.

    b. If the participants do not reveal their roles, identify the activities that affected by the risk from the analysis tool and then use the goal model to:

        i. Determine the first related stakeholders (Direct stakeholders) by listing the actors (Roles) who perform this activity

        ii. Determine the second related stakeholders (indirect stakeholders) who depends on the direct stakeholders on the identified activity

        iii. Determine the third related stakeholder (indirect stakeholders) who has a dependency with the direct stakeholders on another activity

3. Return to step 1 to choose another risk from the risk ranking matrix and start a new future wheel.

4. Once the future wheels of all risks is completed, the assessment team can get a clear overview of the direct and indirect stakeholders who may influence by the occurrence of the identified risk

Risk stakeholders wheel

Risk stakeholders wheel