

UNIVERSITY OF KWAZULU-NATAL

Pre-Implementation Requirements for the Design of a
Monitoring System for Staff-Student Interactions at a
University

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DECLARATION

I Ruchit Mahabir declare that

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For all the times you asked, “How’s the research going?”
This is how it’s going; I just wish you were around to see it.

This one is for you Dad.

Abstract

University environments occasionally fail to provide adequate levels of security for student and staff interactions. Existing policies outlined by a university document the procedures to be followed in said interactions. However, there is a lack of enforcement of these policies and any artefact to aid this enforcement. This is apparent as incidents of misconduct are regularly published. This study aims to define the requirements for an artefact that monitors these interactions, and as a result, will provide different benefits to those involved. Subsequently, a design for the artefact will be generated based on the revealed requirements.

In order to establish the major factors influencing this artefact's design, a qualitative approach with an exploratory design was chosen. The use of a modified Unified Theory of Acceptance and Use of Technology framework provided related measurables. Through a purposive sampling technique, a focus group was formed, and a discussion was held to allow for in-depth emergent and systematic analysis until saturation was reached.

Results indicated that the artefact's functionality should be tailored toward providing safety during interactions through the use of accurate identification of all involved parties. The artefact should be portable, provide adequate levels of confidentiality, and be partly autonomous - to the extent that the integrity of the recording and its details cannot be disputed. Performance expectancy, identifiability and social influence were the primary constructs associated with the system's acceptance. A system designed to the uncovered requirements and activated during an interaction, will provide users with a higher level of perceived safety and usefulness, thus influencing their behavioural intentions and overall opinion of following through on engagements with other parties.

Further investigation can be conducted through the expansion of the sample utilised. This expansion should account for the different socioeconomic backgrounds of the individuals enrolled at universities, as well as the impact of COVID-19 on the said individuals and their ability to resume studies in the changing environment.

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1. Introduction

This chapter sets the context for the research. It provides details on the gap identified by establishing the current scenario in effect. It continues to set out the research problem, research questions, and subsequently the research objectives to be achieved. The significance and justification of this research is then discussed, followed by the ethical considerations to be adhered to. Lastly, the limitations of the study are described to close off the chapter.

1.1. Topic

Analysis of pre-implementation requirements for the design of a monitoring system for staff student interactions in a university environment.

1.2. Overview

Accurately documenting interactions between academic staff and students within formal University environments is important for various reasons. This study aimed to design pre-implementation system models of an automated cloud-based recording system for use at the University of KwaZulu-Natal (UKZN). This system in question would be used during interactions between staff and students in formal environments such as an office space. The reason for this precise location is discussed in-depth as it forms part of the basis for the rationale behind this study. The use of technology is in the form of a conceptual system model designed to log the events of any interaction, as well as the attendees participating. The modelled system is intended for, but not limited to, interactions between staff and students, as it can also be used between members of staff.

The primary aspect discussed, which is classed under the broader term ‘management’, is a system that addresses the requirements of logging both events and identifying details during an interaction. The underlying question answered are: can a system provide an environment where individuals feel safe to conduct their meetings? This deals with problems that arise when information relating to the events of these interactions is lost due to a lack of correct documentation. This system additionally provides support to two secondary areas of concern, namely academic enhancement, and dispute resolution. Content generated by this system will be accessible only by the involved parties and could be used as a learning resource or in matters that require resolution. While the infrastructure capabilities of the institution in handling such a system was not dealt with in this study, an overview of the system requirements and design is presented. This is necessary to understand the perceptions of the potential users towards accepting a monitoring system.

1.3. Background of the study

Interactions between staff and student occur daily throughout a university's premises. Reasons for this include, but are not limited to, formal academic sessions, and more casual social visits. Whether formal or not, it is not uncommon to let these meetings go undocumented. Among the many reasons, students may enter a meeting with a staff member to clarify areas of concern in their studies. This concern could stem from a lack of understanding or information and thus further explanation is sought from the staff member. Unless personally conducted by an involved party, there is no standardised system implemented for logging the occurrences of the interaction. Depending on the levels of competency of the parties involved, any recordings captured may not adhere to a standard that is deemed acceptable when the resolution of any dispute is required. This also applies to documenting the interaction through written methods as the involved parties may not be able to correctly document the content and thus the information generated may be lost or of no benefit.

The current lack of a system could greatly hinder the integrity of the institution. As one's safety is of utmost importance, unmediated interactions by a neutral or trusted party could be a deterrent to many individuals. The need for one's own physical and intellectual safety may even prevent future interactions if there is a fear of one's integrity being called into question.

Misconduct does occur with cases making headlines in the past (Govender, 2012; Pillay, 2019). Some cases refer to events that occur outside of a proposed formal environment, however, cases do fall within the scope of the proposed system environment. An online newspaper article in the UK published that 1953 claims of sexual misconduct were made across 132 universities over a seven-year period (Batty & Cherubini, 2018). This figure is a basis for general sexual misconduct at a university. The article goes on to say that the conducted survey established that 732 investigations were specific to staff and student misconduct. These numbers are not complete as some universities could only provide information with the data that was available for collection. Several complaints were unaccounted for due to poor management between departments.

The inclusion of a centralised system would possibly increase academic integrity at the place of implementation. Incorporating the current policy on "Managing conflict of interest in staff and student inter-relationships" (University of KwaZulu-Natal, 2007), as well as the internal policy for "Professional conduct for academic staff" (personal communication, 27 May 2009), a system could aid in the enforcement of these policies. A supporting factor for a centralised system is that there is always a way to recall the events of any interaction between academics and students in any academic

environment at the institute. The data gathered during an interaction enquiry or provide evidence at one.

1.4. Research problem

The primary concern addressed is that upon staff and students engaging in interaction there may be no form of evidence to corroborate that any interaction or the events of said interaction occurred. This, therefore, implies that no proof of what occurs during this interaction is logged either. A leading factor in supporting this research is that there have been instances of accusations made at tertiary institutes where misconduct has been at the heart of the situation (Govender, 2012; Batty & Cherubini, 2018; Pillay, 2019). With no system in place, it could prove difficult to corroborate the accusation for any legal proceedings (Meintjes-Van der Walt, 2010).

Current methods to document interactions include personal recordings conducted by the parties involved, however, the integrity of these recordings can be questioned if accusations are made (Meintjes-Van der Walt, 2010). This data could also be easily lost due to mismanagement. There is no generally accepted method at UKZN to neutrally make a note of the participants of an interaction. If physical documents are made during an interaction, the accessibility of these documents may prove to be more difficult than when using cloud-based systems.

If a standardised system, which is approved for use in legal matters, were to be implemented and maintained by an institution, it could hold more integrity as it would be viewed as an external neutral party if accusations were to be made and evidence required (Meintjes-Van der Walt, 2010). Whether the content is academic or evidence of any form of misconduct, the recording can be retrieved from the central system to be utilised. The accessibility of the recordings will be limited to only those parties involved. Alterations will not be permitted as they will be stored on a secure external server. In this way, during an interaction, there is a digital record logging who partook in the interaction, what transpired and when it occurred.

1.5. Research questions

1. What aspects of identification, described by staff and students, guide the design of the system?
2. What functionality of the monitoring system is being necessitated by societal needs?
3. How should the autonomous nature of the system be designed to ensure an acceptable level of effort is used?
4. How can the security of the monitoring system be designed to ensure that confidentiality is upheld?
5. What software platform best suits the needs of the monitoring system?

1.6. Research objectives

1. To understand how identification guides the design of the monitoring system.
2. To determine what functionality of the monitoring system is being necessitated by societal needs.
3. To provide requirements for the design of an autonomous system with an acceptable level of user effort.
4. To define the design specification of a monitoring system where confidentiality is upheld through stringent security measures.
5. To establish the best software platform to release the monitoring system on.

1.7. Significance of the study

The proposed system requirements models demonstrate a design to generate data based on the interaction between staff and students. Thereafter two main areas can benefit from this data. The data will always be stored in its encrypted, unaltered form, thus meaning that for any clarification purposes during disputes it can provide clarity. It can also be used by an individual as a learning resource in this form accessible only to the parties involved through the use of private keys/codes for access.

To protect user privacy before processing, the data can also be de-identified. This is the process of removing any identifying details from the data. Thereafter, data mining and data analysis (with consent from involved parties) can lead to knowledge creation.

The option of implementing such a system could greatly improve the working environment on the university premises. As the system will provide neutrality and in no way impact the natural flow of a meeting, it must be automated and require no user input. Establishing the perceptions of users towards such a system could set a solid foundation for future developments of said system(s) in similar environments.

1.8. Justification for the study

The rationale for this research is primarily driven by a general lack of a monitoring system in formal environments. During interactions between individuals in a closed environment at UKZN, there is no standardised system to provide security to the parties involved. By-products of the monitoring system include but are not limited to the following:

- 1) Dispute resolution and accountability: With a system in place, any disputes over the events of the interaction can be settled by viewing the documented data.
- 2) Learning enhancement: The system would allow students to listen to the content discussed during the interaction. If the content pertains to their studies, it could be considered learning material and used to assist them.

In light of recent events and a general outcry for the fight against gender-based violence (Govender, 2018; Maphanga, 2019), a system to prevent or deter actions of misconduct needs to be implemented. Conducting this study aids in enabling the safety of individuals during interactions in universities. Left undone, the safety of individuals involved in interactions and the integrity of the university can always be brought into question.

1.9. Ethical consideration

As with any study involving external participants, ethical factors need to be considered. Factors related to privacy and confidentiality, as well as anonymity, must be addressed to protect the individuals involved in data collection. Principles from The Belmont Report (Ryan, Brady, Cooke, Height, Jonsen, King, Lebacqz, Louisell, Seldin, Stellar, & Turtle, 1979) was taken into account when conducting any interaction with research participants.

Informed consent is crucial for proper ethical treatment and to ensure that this was upheld, a thorough explanation of what the research entailed was drafted and available to be read by individuals involved in data collection. In this manner, any queries and uncertainties from the participants' side could be resolved. No identifying markers were intended to be captured, nor is data being stored for a period longer than required.

1.10. Limitations of the study

A considerable limitation in this study was not having a tangible instantiation of the artefact to interact with and observe during data gathering. It was for this reason that a modified UTAUT model, Figure 2, was used to test user acceptance of the artefact. An artefact, in the form of a model of a proposed system, can only affect one's perceptions of the system, as they make judgements based on what they are able to understand from the models and not from actual use (Venkatesh et al., 2003). These perceptions provide great insight; however, definitive conclusions can be difficult to ascertain due to the nature of the research design as well as the small sample size (University of Southern California, 2019).

Since this study was only conducted on one college campus, it may not be representative of college students in general. The sample was broad in the sense that it incorporated staff and students from different years of study and backgrounds, however, further verification of the results could be done through the use of multiple sample groups to find saturation of the system design. Such sample groups could be from across a greater variety of campuses and as a result, will contain individuals from different backgrounds and socioeconomic statuses.

The design requirements were primarily focused on students with access to mobile devices that can allow for third-party apps to function as desired with access to certain functionality. Older phones, perhaps within the group of students from lower socioeconomic status, may provide different perceptions of the design of the system.

The sample group did not include first-year students due to the restrictions applied by lockdown protocols. First-year students gained very little experience in staff student interactions as the covid lockdown was implemented very early on in their studies.

1.11. Dissertation Outline

The study starts by providing a basis for the research by establishing the groundwork necessary. This is achieved by examining secondary research and providing a review of the current applicable literature. It is followed by the theoretical framework used in guiding this research. The research methodology then outlines the semantics of the approach taken and the criteria applied to selecting the sample. The data collection methodology and secure storage thereof is also discussed. Data analysis procedures are explained thereafter. With the groundwork set, the research continues to the findings and analysis stage, followed by the discussion, and lastly, the conclusion.

2. Literature Review

This literature review investigates areas that include interactions in an educational environment, how technology is used to enhance productivity and how technology can be used in automation of processes. Data documentation methods and established recording systems are discussed, followed by the legalities surrounding recorded data. Lastly safety is touched on as this leads directly to supporting the reason for the research. The impact of Covid-19 is mentioned as the global pandemic has affected most aspects of life. The theoretical framework is then outlined to close the chapter.

2.1. Literature review

2.1.1. Interaction in education

Interaction is a vital part of human development (Bornstein & Bruner, 1989; Newman & Newman, 2016; De Felice, Vigliocco & Hamilton, 2021). The online Cambridge dictionary defines ‘interaction’ as: “an occasion when two or more people or things communicate with or react to each other” (Interaction, n.d.). As an individual grows, the type of interaction changes due to changing situations (Bornstein & Bruner, 1989). In education, this is no different, as interaction among academics is important to the development made during the learning process (Githens, 2007; Tewari, Ilesanmi, & Serpa. 2020).

Özerk (2001) found that the meaningfulness of interaction in an educational setting is affected by the number of individuals involved. When dealing with a smaller group of students, the students were more able to voice their opinions and be more actively involved (Tricio, Montt, Orsini, Gracia, Pampin, Quinteros, Salas, Soto, & Fuentes, 2019). This ability to voice their opinions could be due to the concept of intellectual safety, where students feel more comfortable in an environment and partake in the ongoing events (Githens, 2007).

Resource usage can also be affected by the relationship between students and staff. During a study conducted by Bluestein (2015), it was noted that the type of relationship built from the interactions between students and staff could have the potential to affect the students’ outlook on their studies. The more positive the interaction, the more the student may be inclined to perform better. Some students appreciate it when there are extra learning resources available (Githens, 2007).

2.1.2. Technology as a tool to enhance productivity

When introducing technology into the educational environment, one of the main topics to address is the needs of the learner (Davis, Connolly & Linfield, 2009). This, however, is not implying that the technology is guaranteed to be used. Park, Lee, & Cheong (2007) investigated the acceptance of electronic courseware by university instructors and found that incentives aid the utilisation process. For learners, flexible access to resources and facilities should be provided. The choice of resources, how to use them and what method to access them, all should be dependent on the learners' preference (Lewis, 1999). One more commonly used method to access this abundance of resources is through the Internet (Githens, 2007; Lewis, 1999; Naude, 1999). Previously, communication technology was available in South Africa, with the only drawback being accessibility to the general public. In 1999, South Africa had an Internet penetration rate of 5.5%, and that rate rose to 54% in 2016 (International Telecommunication Union, 2017). This indicates that a majority of the people of South Africa now have Internet connectivity and the opportunity to access online resources. Most tertiary education institutes provide their students with Internet access to aid the learning process, with the South African Government aiming to provide a monthly data ration to its citizens by 2024 (Business Tech, 2022). The development of cloud infrastructure has also become crucial to both providing services and storage (Microsoft, n.d.). Tertiary education institutes may provide access to cloud storage to all registered students, which they may use for personal and academic reasons. Cloud storage allows for resources to be accessible from different devices and locations, provided access to the cloud storage space is available (Google Cloud, n.d.; Amazon AWS, n.d.).

Using the Internet as a means of connecting to the resources is acceptable, granted the technology infrastructure is reliable. Businesses rely heavily on technology as it is used in improving general productivity and business practices (Caldeira, Serrano, Quaresma, Pedron, & Romão, 2012; Sharma & Sheth, 2010). This use of technology has allowed more users to access data they deem necessary, and in the same stead, provided a solid basis for the use of technology to broaden the reach of information (Sharma & Sheth, 2010).

A study conducted by Abeele (2020) investigated the gratifications associated with mobile use among adolescents. Within the research, it shows that there are 8 main areas of gratification associated with everyday life. Among these 8 areas, is the area of schoolwork, suggesting that the sample productively used their mobile.

When individuals are introduced to a new system, specifically a mobile learning system, their opinion on adoption is based on multiple factors. Included in those factors is 'inconvenience' (Shudong & Higgs, 2005). Editing on mobile devices had limitations due to the lack of functionality. Granted this research was conducted more than a decade ago, it still has a basis in the fact that if inconvenienced, an individual may choose to not adopt the new technology (Davis, 1989; Venkatesh, Morris, Davis & Davis, 2003). Cell phones were designed for communicating and not for learning, as stated by Hao, Dennen and Mei (2017).

Kim, Lee & Rha (2017) investigated the issue of resistance toward mobile learning and found that the concept of relative advantage is the most important factor to consider when trying to increase one's intention to use mobile learning. Reducing the resistance is essential for system adoption (Kim, Lee & Rha, 2017; Huang, 2014).

There is also a degree to which social influence affects the use of mobile learning systems (Hao, Dennen and Mei, 2017). Social image affected student perceptions with regards to ease of use and usefulness. They also found that voluntary use of the system positively influenced acceptance. This suggested that system use was more accepted when users were provided with a choice, rather than having the system being forced upon them.

The type of technology should also be investigated, with there being a variation of devices and platforms to utilise. With larger desktops being phased out due to the increasing adoption of mobile devices, student utilisation of these devices for learning is lacking. Device utilisation to mimic the functionality provided by that of a standard computer was displayed by a majority of all participants, however, the use of these devices for learning purposes was lacking in comparison (Alfawareh and Jusoh, 2014). Contrary to this Madlala, Civilcharran and Singh (2020) have found that students have a positive attitude towards using smartphone apps for learning purposes. It also concluded that the factors influencing the usage of the smartphone app are those constructs in the Technology Acceptance Model, henceforth referred to as TAM. It should be noted that the time at which these studies were conducted may have an impact on the conflicting results.

To show the progression of technology, a study done by Shudong & Higgs (2005) shows certain technical limitations associated with mobile learning from the year 2004. These limitations, consisting of low-quality screens, limited interaction with the device, internet restrictions, lack of standardisation across devices, and lastly storage, which was applicable at the time of the study, are

not applicable now due to technical advancements. High-resolution touch screens, fast internet, and online cloud storage have overcome these limitations. As time progresses, technological barriers would pose less of an issue (Vogel, Kennedy, Kuan, Kwok and Lai, 2007). Technological barriers realised during the sudden change to COVID-19 remote learning fall under four major themes. Device Issues, Internet Connectivity, Cost, and Skills. Device issues pertain to that of physical technology and not having compatible devices or restrictions on the device in use. Internet connectivity includes areas of stability and general access. Devices can be costly and that is why cost was uncovered as a major theme. Lastly, certain skills are required to effectively engage with the device or software used for learning.

Smartphone usage for mobile learning was perceived positively as understood from the student responses. These responses showed that students appreciated the time to work on the tasks at their own pace, with one student saying:

“So, I can download it at school and then do it at home when I have time.” (Vogel, Kennedy, Kuan, Kwok and Lai, 2007, p. 6).

2.1.3. Automation in technology

Parasuraman, Sheridan, and Wickens (2000) discussion concerning technology automation and the degree to which it can be done can be broken down into a four-step model:

- Information acquisition
- Information analysis
- Decision and action selection
- Action implementation

These stages are similar to what Ilgen, Hollenbeck, Johnson & Jundt (2005) describe in the work done by Steiner (1972), McGrath (1984), and Hackman (1987) in the Input-Process-Output (IPO) Model. This model is often taught as the structure in describing the process of converting data into information. These same processes can be done through automated technology. Technology can be used to provide aid through this process and reduce the level of human interaction, however, the initial question to answer is whether automation is required.

Automation has expanded vastly since its beginnings in manufacturing. Goldberg (2012) explains how the idea of automation is to provide a certain level of quality; quality consisting of reliability, productivity, and efficiency. Successful automation design results from ensuring that the correct level of automation is decided upon for a specific function and ensuring it completes the desired tasks (Parasuraman, Sheridan, & Wickens, 2000). Additional consideration should be placed on the factors that affect the use of technology. Mumtaz (2000) addressed the use of technology by teachers and determined that if the technology is perceived as useful, then it will most likely be used (Davis, 1989), however, there is always the possibility that some individuals may not use the technology. A common mistake is the assumption that technical competence may affect the utilisation of any new technology. This was disproven and instead, it was found that the attitude of the user is much more crucial to the adoption of new technology (Drent & Meelissen, 2008).

Automation can also have negative effects on a system's usability as users have certain preferences when it comes to the system design (Schöbel, Barev, Janson, Hupfeld, and Leimeister, 2020). If a user is specifically choosing an app because they believe it will aid their productivity, the system design does not need to prioritise innovation and customisation. If a user prioritises ease of use for the app, then adaptivity is in focus, as this determines the system use (Basoglu, Daim & Polat, 2014).

2.1.4. Data documentation methods

When looking into data and information documenting methods, minute taking is amongst the most popular form of documenting meetings. This process usually requires an objective and dedicated scribe with some prior training in the field (Smith, 2013). When taking minutes, there are two approaches: the long-form method and the short-form method. The long-form method places more focus on being thorough and detailed. It is usually used for highly important matters, where if reviewed, provides protection to all parties as all relevant data is noted. Long-form minute taking, however, can be seen as quite cumbersome if done correctly. Standing opposite long-form, is short-form minute taking. As the name suggests, these notes are concise and easy to draft, thus allowing for easy review and efficient documentation. It does not, however, bode well for understanding the thought process behind what was noted in the minutes. Short-form minutes focus on documenting the actions taken rather than the reasoning behind what action was taken (Chandler & Wardwell, 2006).

Delving further into digital transcripts and recordings, both in audio and video form, Chandler and Wardwell (2006) propose that they are inferior to properly drafted minute taking. Recordings could

include extraneous and excessive details, whereas minutes allow for the condensation of information. Certain characteristics are required to correctly take minutes, such as excellent writing skills and informed judgment on what is to be recorded (Chandler & Wardwell, 2006). It is for this reason that minutes could be less effective as learning material for students. The availability of more detail provides the student with the ability to deeper understand what has been said upon further analysis. This provides the opportunity to possibly discover new views on the information that was missed in the recording session itself.

2.1.5. Established recording systems

A look into systems that have similar traits as the desired monitoring system has revealed patterns in their results. Established lecture recording systems have provided information that has led towards its acceptance as well as limitations that hinder the system's functionality. As these are similar systems providing the same core functionality, it may provide insight into how to guide the design of the proposed monitoring system and define system requirements.

Brotherton & Abowd (2004) assessed an automated system that recorded lectures at a university called eClass. The primary objective of the system was to record the lecture through audio and video as well as any digital notes generated through discussions. This system proved beneficial to its users, that being staff and students, and was generally accepted as the users utilised it. A few drawbacks were listed, ranging from technical limitations to security concerns. Privacy when dealing with anything of a recording nature is important and a means to securely store the captured recordings is a vital part of a system's requirements. At the time of the study networking and internet access were not as readily available as it is today, as seen from the statistics provided by the International Telecommunication Union (2017), and thus management of these recordings was problematic. A more general problem was the methods involved in capturing the lecture itself. This deals with the system design and more emphasis should be placed on the quality of the recordings.

A study of four Australian universities that utilised recording technologies to enhance the learning experience found that certain changes occur when introducing technology into the environment (Gosper, McNiell, Phillips, Preston, Woo & Greem, 2010). One major concern was the development of new policies regarding the implementation and utilisation of the new technology. Participants in the study consisted of staff (N = 155) and students (N = 815) and the outcomes measured indicated

positive perceptions that would provide benefit. Eighty per cent (79.9%) of students believed the system would enhance the learning process, whereas only 49% of staff believed the same.

Groen, Quigley and Herry (2016) studied the implications of teaching and learning when using a lecture capture system. The system in question was beneficial to the users and thus deemed acceptable, however, there were considerable drawbacks to the design of the system that produced subpar quality for recordings. One issue was demonstrated in its lack of equipment, where the only device utilised to record audio for the lecture was situated on the lecturer. This led to inaudible moments when other individuals spoke. Stemming from this, a lack of robustness of the system revealed that any extensive interactions or activities conducted during the lecture proved difficult to capture and reduced the quality of the recording. Results indicated that lecturers were unaware of what was being recorded. This could be due to a simple lack of understanding of the system, or a lack of an explanation provided by the system creators or assisting documents.

It is apparent that training should be addressed when implementing new technology processes. When no immediate technical support is to be provided, ease of use should be vital to the design process of the system (Davis, Connolly & Linfield, 2009). Portability, if required, shouldn't require time or excessive effort; the set-up of the system must be simple yet extensive enough to fulfil its functionality; guides or training should be available to assist the users of the system. Suggestions presented for future designs included pre-installed or permanent systems in a venue before the event, as well as the autonomy of the system to prevent the user from being a potential point of failure.

Dommett, Van Tilburg and Gardner (2019) assessed the views associated with choosing whether to use a recording system. Secondary research in this study noted that students have positive perceptions of capturing lectures (O'Callaghan et al., 2017; Pons et al., 2012; Traphagan et al., 2010), however, the limited focus on staff suggests the contrary (Danielson et al., 2014; O'Callaghan et al., 2017). Findings of this study showed that consent was a vital area to address, as well as control over who decides on whether to conduct the recording. Further study by Dommett, Gardner and Van Tilburg (2019) revealed that individuals may adjust their behaviour when under the impression of being observed, more formally known as the Hawthorne effect (Monahan & Fischer, 2010). Of the effects noted during the study, the data suggested negative effects on the behaviour and a reduction in interaction among those parties being recorded.

When analysing the results of these systems, patterns emerge that can help guide the development of a new system. The overall acceptability of a system is influenced by how beneficial the system is perceived to be to its users. This finding is supported by the work of Calisir, Gumussoy, Bayraktaroglu, and Karaali (2014) on the examination of Web-Based Learning Technology (WBLT). Three major traits that influence the level of benefit include its performance of fulfilling its task, the quality of the captured recording and the autonomy of the system. Although implicitly conducted due to the nature of the system, there is no mention of the systems explicitly requiring the information of parties attending or participating in the recordings. Along with this, there is a visible lack of detail on legal regulations with respect to the data generated and the storage of the data.

2.1.6. Legal restrictions

When dealing with a system of a recording nature, safety and security are a priority. There are legal matters to address when handling the creation, capture and storage of content containing personal details. There is the Regulation of Interception of Communications and Provision of Communication Related Information Act (RICA) (South Africa, Regulation of Interception of Communications and Provision of Communication Related Information, 2002) and the Protection of Personal Information Act (POPI) (South Africa, Protection of Personal Information, 2013). The RICA Act states that only those parties involved in the communication may 'intercept' this communication. With regards to external parties (excluding law enforcement), only those who have been given authorisation by the parties directly involved may intercept the communication. The POPI Act ensures the protection of personal information when it is being processed by an authorised party. The authorised party could be either the parties involved directly with the communication or an external party responsible for the interception of the communication.

2.1.7. Safety culture

On a more international scale, the General Data Protection Regulation (GDPR) (The European Parliament and The Council of The European Union, General Data Protection Regulation, 2016) has been implemented as a regulation that is designed to give more control to the people over how their data is used. Within its first year of enforcement, it has generated

approximately \$56 million in fines (European Data Protection Board, 2019). In light of the recent law that was passed in the state of California, individuals have more control over the personal information that is stored by a business. Even though the California Consumer Privacy Act of 2018 (CCPA) (California Consumer Privacy Act, 2018) is not international and only coming into effect in 2020, it may set a precedent for future privacy regulation laws in developing countries like South Africa. A recording system, implemented by the institute, should adhere to these acts granted that permission has been given by both staff and students.

Globally, safety in the university environment has been an ongoing area of concern. Among the methods of harassment in the university environment, it appears that the students are quite likely to experience some form of harassment during their university studies (National Union of Students, 2018). A UNICEF-backed study of universities in Sri Lanka logs different types of harassment present in select state universities (Economynext, 2022). A larger study in the UK (Sample size = ±4500 students) indicated a 62% sexual harassment or assault rate (Revolt Sexual Assault & The Student Room, 2018). In the United States of America, a professor has been charged with sexual harassment against 8 individuals (Witze, 2017). In Australia in a national survey (sample size >30000), 20% of students indicated falling victim to sexual harassment (Australian Human Rights Commission, 2017). The same study indicates females are more than times as likely to be victimised by sexual assault, and twice as likely to be sexually harassed. Solutions toward adequate safety are a widely discussed topic in universities, as is evident from the formation of the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics (Clery) Act in 1990 (Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics (Clery) Act, 1990). This act enforces a ruling that all applicable universities disclose their crime statistics in order to be fully transparent to those involved.

Even though some stats broadly cover university-wide incidents and not those relating to staff and student involvement, there is evidence that staff and student incidents exist and as such, should be addressed in the same manner. Recommendations for rectifying these areas of concern were put forth to help guide the prevention of future incidents (Australian Human Rights Commission, 2017). Step 2 of these recommendations is titled “changing attitudes and behaviours”, this step suggests the

development of measures towards preventing sexual misconduct. Step 4 titled “monitoring and evaluation” recommends evidence to guide the process of prevention and response. Collectively, a system designed to create evidence and prevent future incidents could fit into the requirements laid out by society.

Gender-based violence is also prevalent in society. This is an acknowledged fact by the South African Government, as a law entitled Criminal Law (Sexual Offences and related manners), amendment act 32 of 2007 has been created. The law recognises women and children as being more vulnerable to sexual violence when compared to other genders. The law was designed to help the survivors of sexual violence during the justice process. There is a term called “secondary victimisation”, which is used to describe the experience of the victims due to the level of trauma and suffering.

An initiative by People Opposing Woman Abuse (POWA) and the Centre for Justice and Crime Prevention aims to create a safer environment for girls in educational environments (People Opposing Woman Abuse, Centre for Justice and Crime Prevention, 2017). During this study, a perception of one’s safety was analysed depending on one’s gender. This study’s learner sample (n = 602) had a split of 54 per cent female to 46 per cent male learners in an early adolescent stage (mean age = 13.4 years). Results showed that females felt females are at risk in terms of their safety in their community, as opposed to males, who are viewed as quite safe. A study of college students (n = 697) at two universities in the United States support said findings of there being significant effects of perceptions of safety based on one’s gender (Nolasco, Tsai, & Vaughn, 2022)

2.1.8. Impact of COVID on Higher Education

With the emergence of COVID-19, has come the emergence of associated regulations governing the interactions between individuals. Included in said regulations is the operation of higher education institutes (South African Government, 2021). These regulations have at times prevented access to the university premises and in turn, physical interactions between individuals. For certain courses this may be acceptable, however, for other courses where practical experiences are crucial for the education process, this method is not as effective, and requires visits to the university (Burki, 2020). Such courses include those in the sciences and the medical field. “*Furthermore, online learning is no substitute for laboratory work.*”(Burki, 2020, p. 758)

As a result of new requirements being created because of the unique situation, adjustments to teaching approaches have to be made (Flores & Gago, 2020). Globally, UNICEF education staff around the world are working to support remote learning environments. Discussions have been held with education ministries to promote remote processes and provide a sustainable approach to education through online means (Mizunoya, Dreesen, Akseer, Brossard, Dewan, Giraldo, Kamei, Ortiz, & Molom, 2020).

2.2. Theoretical Framework

Many theories have been established on how to conduct studies to investigate artefact creation in Information Systems (Henver, March, Park, & Ram, 2004; Vaishnavi, Kuechler, & Petter, 2019). Although different, these theories often follow the same overall process during their implementation. There is debate as to what clearly defines an artefact, however, it has been established that it can range from constructs to fully-fledged instantiations (March & Smith, 1995; Vaishnavi, Kuechler, & Petter, 2019). The Design Science methodology (Peffer, Tuunanen, Rothenberger, & Chatterjee 2007; Gregor & Jones, 2007) was used for the creation of the artefacts detailing the requirements of the system. Henver et al. (2004) provide a general Information System research framework that can be seen in Figure 1.

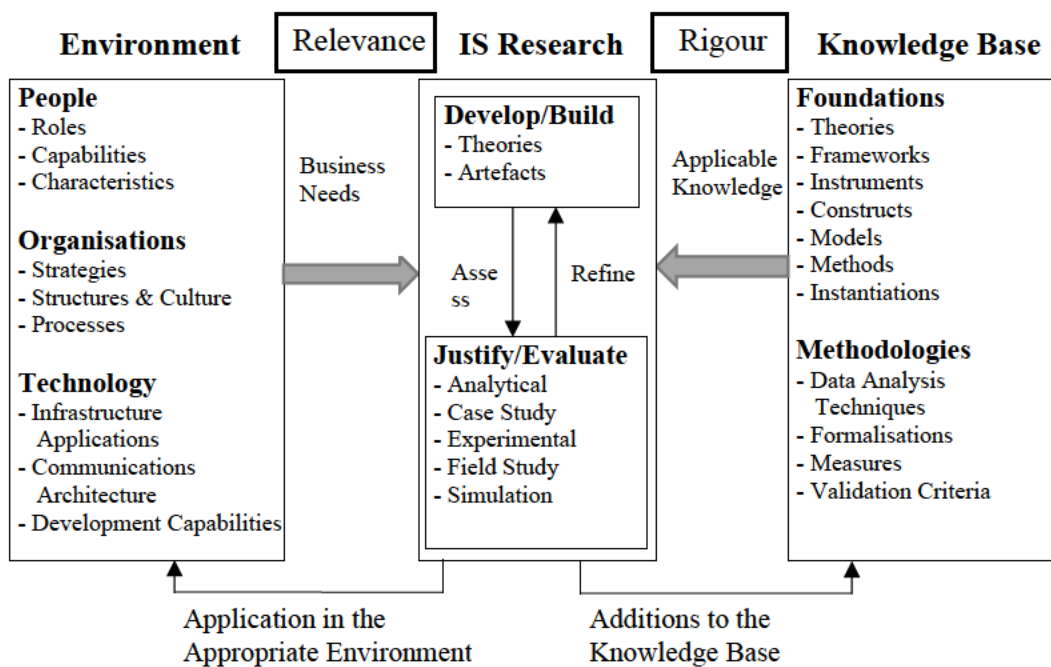


Figure 1: The Design Science Framework as described by Henver et al. (2004).

In the same work done by Henver et al. (2004), guidelines, as seen in Table 1, have been established on how to effectively conduct design science research. These guidelines are not meant to be followed to the letter; however, each guideline is there to be adapted to the specific situation provided during a unique study.

Design science research guidelines	
Guidelines	Description
Guideline 1: Design as an artefact	Design-science research must produce a viable artefact in the form of a construct, a model, a method, or an instantiation
Guideline 2: Problem relevance	The objective of design-science research is to develop technology-based solutions to important and relevant business problems.
Guideline 3: Design evaluation	The utility, quality, and efficacy of a design artefact must be rigorously demonstrated via well-executed evaluation methods.
Guideline 4: Research contributions	Effective design-science research must provide clear and verifiable contributions in the areas of the design artefact, design foundations, and/or design methodologies.
Guideline 5: Research rigour	Design-science research relies upon the application of rigorous methods in both the construction and evaluation of the design artefact.
Guideline 6: Design as a search process	The search for an effective artefact requires utilizing available means to reach desired ends while satisfying laws in the problem environment.
Guideline 7: Communication of research	Design-science research must be presented effectively both to technology-oriented as well as management-oriented audiences.

Table 1: Design Science research guidelines as described by Henver et al. (2004).

The functional requirements for a proposed system in this situation should consist of being able to conduct the monitoring of any interaction between staff and students, as well as containing any additional features deemed necessary for its operation. The artefact should be dependent on the environment it is designed for (Henver et al., 2004). This means that the people, the organisational structures, and the technologies available must be taken into account during the design process. The ‘people’ in the context of this study are the target population. It is the input from the chosen sample, through the use of the focus group, that has been used to determine the full functionality required by the system. The sample was familiar with the organisational structure that is in place as well as the

technology at their disposal. These unique factors established by the environmental setting was used in conjunction with secondary research. This provided a solid basis to justify the functionality required for the system as well as appropriate grounds on which to base an evaluation.

During the evaluation phase a modified Unified Theory of Acceptance and Use of Technology (UTAUT) model, as shown in Figure 2, was used to gauge user acceptance (Venkatesh, Morris, Davis & Davis, 2003). The modified model incorporates all areas of UTAUT that do not involve physical system interaction as only a proposed system design requirements are being created. This implies that the ‘Use Behaviour’, as depicted in the original UTAUT model in Figure 3, will not be incorporated. Some areas to include in the evaluation are its overall utility and its contribution to the current knowledge base by either adding to this knowledge base or addressing problems that have yet to be solved. The Design Science methodology has been utilised in the development of an artefact called Digital Doorway (Botha, Herselman, Smith, & Coetzee, 2012) as well as in the study conducted by Frey (2013).

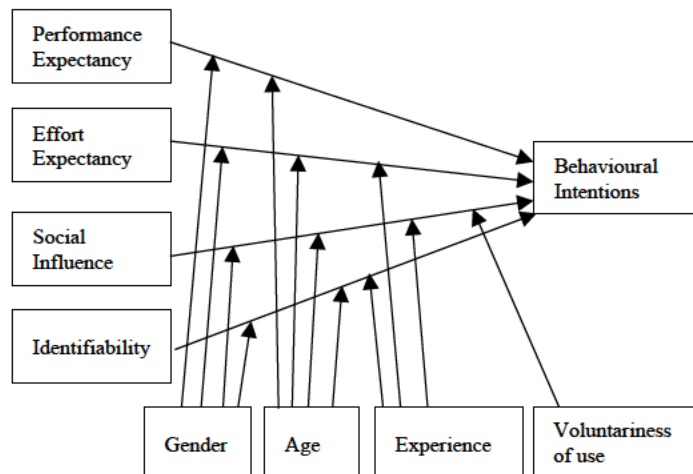


Figure 2: A modified version of the UTAUT model used for this study

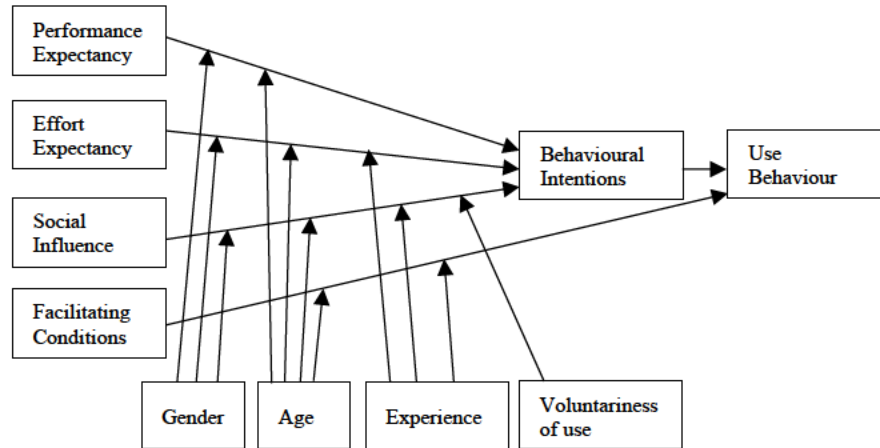


Figure 3: The original UTAUT model (Venkatesh, Morris, Davis & Davis, 2003)

Additionally, interest has been taken in the Accountability theory, first investigated by Tetlock (1985) and Media Richness Theory by Daft and Lengel (1986) as both provide support for this specific situation. The Accountability Theory proposes several constructs for increasing perceived accountability and the Media Richness Theory depicts how the different mediums of communication between individuals create different levels of media-rich information. These two theories add to an area of the Design Science framework which constitutes business needs. Business needs, as outlined in the Design Science framework (Henver et al., 2004) were a driving factor toward the development and evaluation of the artefact. Within ‘people’, as depicted in Figure 1, we have the Accountability Theory as some level of accountability is placed on the parties involved depending on their role in the interaction. The outcome of the Accountability Theory is to use one’s perceived accountability to determine one’s intention to violate a policy. Included in ‘organisational structures’ in Figure 1, is the Media Richness Theory. This deals with the structure and culture of an organisation as well as the strategies it utilises. Having the sample site as an educational institute, its *raison d’etre* is the creation of media and learning materials (Bernbom, 2001). The individuals chosen for the sample are employees with knowledge of the structures being implemented, and individuals utilising the services of the institute.

3. Research Methodology

The research methodology outlines the approach taken in this research. It includes collection methods, data analysis procedures, and sample selection. This was a qualitative study intended to explore the requirements needed for a monitoring system. Data collection would be most valuable when using first-hand accounts as a basis for extracting the requirements, and as such, discussions were held with the sample group to explore all avenues.

Data analysis is discussed at the end of the chapter, providing an overview of how the collected data was processed and analysed. It incorporates aspects of the chosen framework for the study, as well as points from the supporting theories mentioned in Chapter 2.

3.1. Research Methodology

3.1.1. Research design

Although the area of technology being used for mediation may not be an entirely new topic, when addressing the topic within this study's selected sample site new avenues arise. This study aimed to develop an information system artefact which detailed system requirements, and as such, rigorous investigation will be required to make the artefact effective. An exploratory design was used to guide this study as it allowed for in-depth analysis and understanding of what protentional users deem fundamental (University of Southern California, 2019). This artefact changed over different iterations of evaluation as it accounted for new data.

3.1.2. Research approach

The approach taken to conduct this study was a qualitative approach (Silverman, 2017). A statistical relationship between variables was not being tested and thus using a scale to quantify response was inappropriate. It is through a qualitative approach that more relevant data can be attained due to the ability of individuals to express themselves freely. The study focussed on the user's needs and designing an artefact around that, as well as establishing the necessity and context for integrating such an artefact into the environment's required structure. Personal experiences and perceptions were vital to the design process of the artefact. More commonly associated with qualitative research, an inductive approach was used to explore the topic in the desired environment and in search of new perspectives.

3.1.3. Study site

The sample site required must involve a tertiary institution with the presence of academic staff members who meet and consult with students regularly. The consults should occur outside of the lecture session in an environment catering to just a few individuals, such as a staff member's office. It is for this reason that UKZN – Westville campus was selected for the site of the study.

3.1.4. Target population

The target population are members of UKZN, Westville campus. More specifically a focus was placed on the academic staff and registered students of UKZN, Westville campus as a system based the intended artefacts will be for use by these individuals.

3.1.5. Sampling strategy

A purposive sampling technique (Lavrakas, 2008) was used to choose the sample. The study aimed to develop an artefact that satisfies the needs of all its users and as such the need for representation from students in different years of study was essential. First-year students may have different concerns when interacting with staff than those students who are more familiar with said staff members due to prior interactions. Choosing staff members who supervise or interact with students aided in gathering insight into interactions.

3.1.6. Sample size

As a focus group was the chosen method of collecting data a sample size between five to seven individuals was required (Krueger & Casey, 2009).

3.1.7. Sample

The study explored the design of a monitoring system from a pre-development perspective. The study was not aimed to test a pilot system, but rather it was focused on information gathering and validation

towards defining and designing system requirements. Artefact development included documentation, UML diagrams and wireframes.

As described in Krueger and Casey (2009), an ideal sample size for a focus group depends on a few factors. One factor suggests inviting fewer people when attempting to understand an issue or behaviour of the participants. Other factors also include the number of questions, level of participant expertise, and complexity of the topic. The proposed list of questions asked during the session would cover broad areas and enable in-depth follow up questions, thus leading to these focus group sessions having a large number of questions in total. These factors, coupled with the information presented indicating focus groups should be between 4-10 individuals, were used to determine the focus group size of 7 individuals; 6 students and 1 staff member. All participants fulfilled the requirement of having engaged in a staff student interaction, so as to speak from experience.

Due to circumstances related to COVID, first-year students had little time to interact with staff on a face-to-face basis, thus they were excluded from the sample group. Participants were from different disciplines, to allow for the range of experiences to be noted.

3.1.8. Data collection methods

An effective way to understand a user's reaction to the artefact is to ask the user directly in the form of open-ended questions. This method allows users to explain their thoughts in greater detail than what would be allowed if answering a closed-ended question survey. Silverman (2017, p. 6) acknowledges this in a paper, "Donna, along with other participants, provided a unique voice during the collection of data, yet that voice was ultimately muted by the deadening 'thud' of an aggregate statistic" As users are both staff and students, and a system that pleases both parties is required, a single focus group consisting of both parties provided the most accurate data as deliberation between the individuals was encouraged (Dawson, Manderson, Tallo, International Nutrition Foundation for Developing Countries & UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, 1993)

3.1.9. Data quality control

All data collected aimed to address the research questions. Measures were taken to avoid putting the research participant in a position where personal information needed to be disclosed. In instances where this could not be avoided in the responses, de-identification (remove all identifying details) the data before analysis was made.

3.1.10. Measurements

Measurements in a qualitative study cannot be measured according to numbers but rather involve analysing the deeper meaning in the data gathered. This study aimed to understand users' requirements and acceptance of an artefact. Based on the responses to the focus group's general line of questions (Appendix A), patterns were sought after and compared to constructs of the evaluation model, thereafter, the meaningfulness of a responses were determined.

3.2. Data analysis

An inductive approach was taken to analyse the data. Johnston (2014) indicates how "inductive reasoning follows the chain of events to help predict a conclusion" (p. 3) and later goes on to say, "there is no pre-judgement taking place" (p. 6) when speaking about inductive research. The suggested process aimed to allow for the data that had been gathered to drive the research and thereafter create theories based on said data. This process proved valuable as when designing the artefact, it was based on the gathered users' requirements. A well-established guide for qualitative analysis has been outlined in the book "Analyzing qualitative data" (Bryman & Burgess, 2002). Four steps are described and helped guide the overall analysis process.

Simple preliminary models to describe the artefact have been made based on secondary research (Appendix B). These models have been designed to address certain requirements of the artefact. The artefact has initial functionality based on the constructs of the Accountability theory and Media Richness theory, with emphasis on identifiability. Interaction-flow utilising the system has been described, as well as details of what information will be associated with a generated recording entry. These diagrams were presented to the focus group participants during the data gathering process in order to aid their understanding of the proposed system.

To initiate the analysis process, all data was recorded immediately and any other details documented. Any observed details and highlights from the collection process were noted. Qualitative data is more open to quick mental analysis, allowing for certain patterns or themes to be uncovered early on in the analysis process. Semantic themes usually appear quicker as data is taken at face value. During the capturing of the data, an initial understanding of major themes were established, as well as any unusual information that may not have followed any patterns.

As explained by Onwuegbuzie, Dickinson, Leech & Zoran (2009), the constant comparison analysis (Glaser, 1978, 1992; Glaser & Strauss, 1967, Strauss, 1987) is a method to analyse qualitative data. This process involves three phases to refine and categorise the gathered data. The first stage is to separate the data into small units and assign each unit with a code. This code is a way to describe the general feeling of the unit. The second stage involves grouping the coded units into categories. Thereafter in the third stage themes are developed according to the content in each group. Theme development may be in line with the constructs required, however, at this stage the emergent focus group design may produce new themes.

The theme's uncovered should correlate to the requirements of the artefact. In order to ensure that the functionality is verifiable, a point of saturation needs to be reached for the focus group data. It is at this point the focus group becomes a systematic focus group, used to verify the information to a point of saturation. Krueger (2002) provides an overview as well as an analysis of focus group proceedings. Five steps are defined that initiate analysis during the focus group discussions and continue through to the final report preparation. During these five steps, and before the final presentation of the reports, verification can take place to refine the data gathered and ensure reliability. To reach saturation, the modified UTAUT model in Figure 2 was used as an evaluation rubric among the participants.

In conjunction with the constant comparison analysis method, relational analysis was conducted on the themes discovered. In this way, latent themes, as well as key aspects and their relation to each other, were uncovered. The relational analysis was included as it allowed for a deeper understanding of the functions required in the artefact. Each function on its own may provide some result but functions could also rely on their interactions with each other to produce a more meaningful result.

Following this analysis, the data is displayed and structured in an easily understandable manner. Relationships and conclusions should be easily discernible from viewing the processed data. By utilising the displayed data (graphical or textual), conclusions were reached. Research questions were

answered through these conclusions and the final stage of the inductive process was conducted – the development of a theory.

Once these variables are calculated, they are presented in an easily understandable manner. Visual depictions of statistics tend to be most easily understood, and thus is incorporated to display the results of the analysis.

4. Findings and Analysis

4.1. Introduction

The research done until now laid the basis for the study, providing a guide on how to go about gathering data and analysing it. As mentioned prior, the data was coded to find prevalent themes and these themes were used in designing the conceptual models for the artefact. These concepts included wireframe models as well as unrefined and refined UML diagrams.

This chapter focuses on the analysis of the data and subsequently presenting the findings. The structure of this chapter is guided by the themes, upon which the five-step process of Figure 4 is applied. Within each theme, the gathered information will be presented and analysed per the respective theme. This analysis will consist of discussing the initial data gathered, in conjunction with secondary research, to determine the artefact requirements. Further analysis of the supplementary data – data gathered after refining and presenting the conceptual models – is conducted.

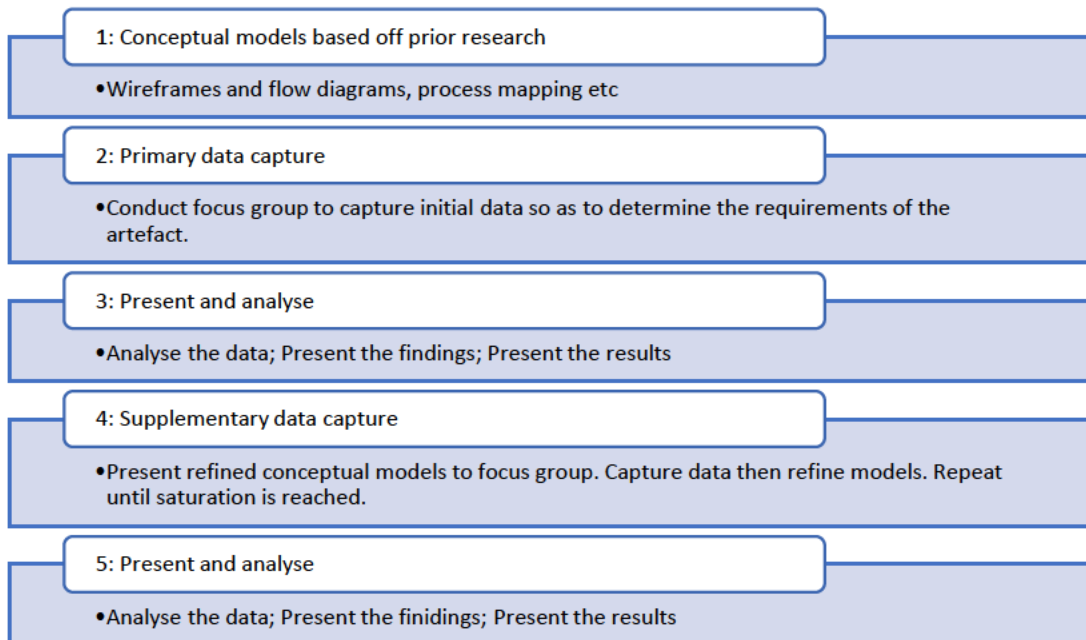


Figure 4: The structure for the analysis process of each objective

The structure of the study was designed to follow an exploratory qualitative method. The focus group questions provided a guideline in respect of analysis: the questions being separated into themes related to the different aspects of the interaction occurrence. Largely, these themes are ‘safety’, ‘necessity’ and ‘documentation’. A further ‘general’ section was incorporated to encompass any

smaller areas. As it is possible that these themes have some common ground, there may be questions that draw from multiple themes.

The artefacts' design was initially based on the preliminary research conducted. This initial design was aimed at addressing some limitations uncovered in prior research. The first design requirement was to enable the device to provide safety to those parties involved. As it is merely a device to be used to monitor the interaction, safety would appear in the form of controlling the behaviour of the parties because of their knowledge of the interaction being recorded. If there is a possibility of accountability for actions, then one would adjust their behaviour accordingly (Tetlock, 1985).

The second point to note would be 'documentation'. The device would serve both as a means to provide safety, and as a means to log the content discussed during the interaction. The opportunity to use the recording for learning purposes should be present, even if it is not being used. It should be up to the learner to choose their preferred method of access (Lewis, 1999) and allowing the use of the recordings will provide an additional method.

The last theme to be discussed is 'necessity'. It may seem like necessity would not have much influence on the design process. However, necessity by its definition is determined by one's need (Cambridge University Press, n.d.) and in this instance it is the need for the artefact. TAM and UTAUT have provided a basis indicating ease of use and potential benefits, and how it affects the intention to use. The artefact to be designed should be done so according to guidelines defined by the framework developed for this study as well as incorporating the hierarchy of constructs established.

4.2. Safety

Safety drew on the need for safety during an interaction. This theme was uncovered during prior research when indications of misconduct were widely reported (National Union of Students, 2018). This theme was focused on the safety of the students as they were the individuals who were the victim of the misconduct. It attempted to gauge whether one's safety affected the need to engage with staff members; did the feeling of vulnerability and insecurity outweigh the necessity of the interaction?

The concept of safety is unique for everyone. Different individuals require different levels of safety to feel at ease. Certain attributes contribute to one's level of safety, including but not limited to, age, ethnicity, and gender. Gender-based violence is of primary concern when dealing with interactions, as evidence shows females fall victim to gender-based violence more than males. During analysis,

the gender of the participant and staff member ultimately determined the level of safety that was felt during in an interaction.

The initial question posed to the group to start the discussion was:

“Are you ever worried about your safety when going into an interaction with a staff member or student?”.

As the question prompted a binary response, it included the standard ‘Yes’ and ‘No’ replies. However, one participant prompted further discussion from the participants who initially just resorted to the binary response. The response being:

“I have. I don’t want to worry, but I can’t help it. I’m not the smallest of people; I can hold my own but there’s still that social stigma or whatever you call it attached to being a female. We’re seen as the weaker sex, and people try to take advantage of that. I don’t know the staff members I’m going to interact with - well at least I didn’t when I first started at university, and going into a meeting with them scared me. Sometimes I genuinely didn’t even go to see a lecturer because I was that worried. Eventually, over time, I started to get to speak to the lecturer during lectures and in passing, and that’s when I started to slowly trust them. After that, I used to go into meetings with them. Don’t get me wrong. I was still worried because there’s always the possibility, but it was less of a worry because I knew the person now.”

This response allowed for follow-up questions. When asked why the individual felt this way, the response indicated it was the environment not being able to provide adequate safety. This environment relates not only to the physical space in which the interaction occurs but the culture associated with that space. Whether it be from an institutional level or a societal level which feeds into institutional culture. The student felt it was due to a societal level of insecurity being carried into the workplace environment.

A participant who initially responded with just ‘Yes’ provided a follow-up after hearing the prior response. This provided insight as to why she said ‘Yes’.

“I’ve always been aware that there are times when students get taken advantage of by lecturers. Maybe I noticed it from news reports or I’m mistaking stuff from movies as memories and it’s just influencing my opinion, but as a female we’ve always been taught to be cautious

when going into an environment with another person, especially a male. My parents always told me, 'Do this to keep yourself safe' or 'Do that when meeting someone'. For example, they always say 'know your exits and environment'. If you're being chased or followed, know where to go. I think what they're saying is to plan and think of the possibilities, so you're never caught off-guard."

Digging deeper into this line of questioning, a further question was asked:

"Do you take any steps to make the environment safer for yourself?"

The following is an extract of the transcript containing several responses:

"If it's possible I usually arrange any meetings in a public space. It's open and deters any trouble. If that doesn't work, I tell a friend or family member just so they know."

"If it's possible I do the same, by trying to make it public or outdoor. But when I meet with any lecturer indoors, I usually ask them to keep the door open if they make a move to try to close it. That way I feel safer and if anything were to happen, I can easily call out for help. Most of the time though the lecturer doesn't bother with closing the door, so I don't need to ask."

"As teachers, we try to take steps to encourage students to come through and interact with us. I practise the open-door policy when my students come through and, on occasion, they have thanked me for that."

The information in the excerpt indicates that females feel more vulnerable when planning a meeting or going into an interaction with a member of staff, and specifically a male member of staff. This vulnerability stems from one's need for personal safety and is instilled in them by society through prior incidents of relatable gender-based violence, or through their upbringing which makes them constantly on alert for danger. There are certain steps which they take to lessen the level of danger present, and these steps are not only taken by the female participants but possibly by teachers as well - as indicated by a student's response. There may be a generalisation among the responses, but it is evident that there are staff members who actively try to aid students by putting their minds at ease when engaging in an interaction.

A note should be made that during this discussion very little input was provided by the male participants of the group. These participants unanimously responded with a ‘No’ when asked if they felt worried about their physical safety during an interaction. Because of the lack of input, a question was asked to the male participants:

“Are you aware of gender-based violence?”.

The results were again unanimous. All male participants had heard of gender-based violence. They were aware of the problems associated with GBV; however, they felt they were not at risk because they understood GBV to be associated with females being victimised. Figure 5 shows how all participants who felt for their physical safety were female, whereas with other forms of safety, males felt more at risk.

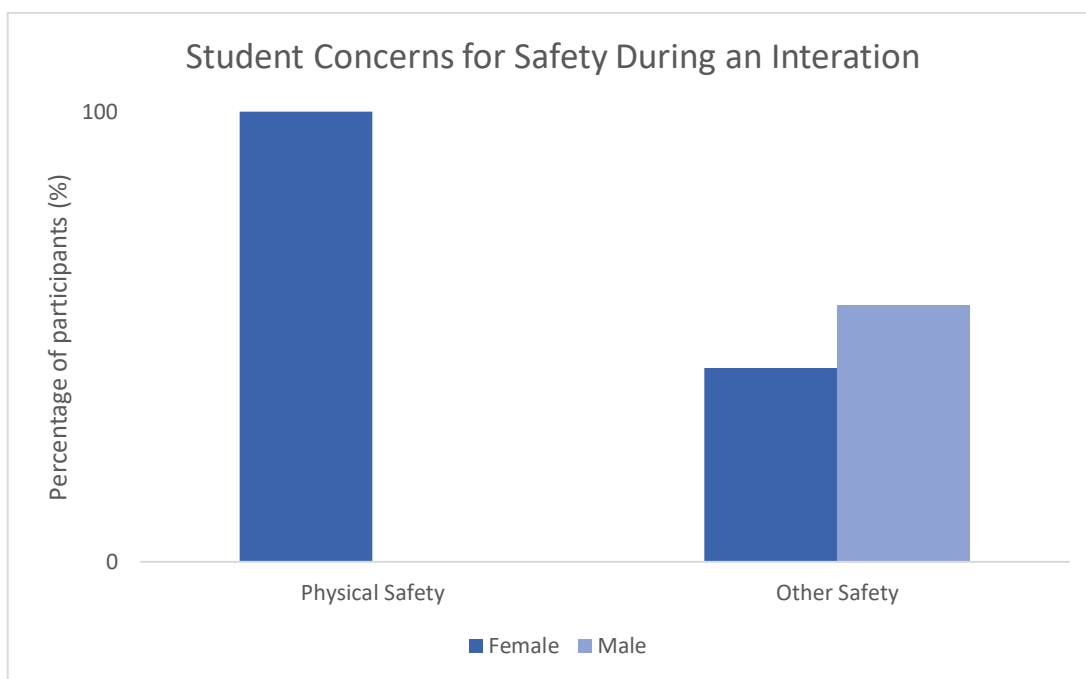


Figure 5: Difference between the safety concerns of male and female participants.

The discussion was brought back to the point raised about not knowing the staff member well enough to feel safe. The group was asked to think back to their respective first year of studying at a tertiary institution. They were asked about their thoughts on interacting with a member of staff. All students in the group responded with feelings of hesitation and intimidation. When utilizing the natural divide that occurred because of the initial question of safety, when separating the responses by gender it

became clear that the reason for the hesitation was different. The males feared more for their social safety than their physical safety. They did not wish to be negatively characterised by the lecturer. The females feared more for their physical safety – not wanting to put themselves at risk. Females consider taking extra precautions when planning a meeting. This includes going out of their way to inform a third party, whether it be family or a friend, that they are meeting with a member of staff at a specific time and at a specific location. The contrast was visible from these two responses:

Response from a male student:

“I was also intimidated but not for my physical safety. It was more like I was afraid of looking stupid in front of the lecturer. I didn’t want to go to the lecturer at times because I wasn’t sure whether what I was going to ask was even worth their time. I really didn’t want the lecturer to class me as ‘that kid’ for the rest of the semester. As for the students, we barely knew other people in the class at that point right, so there weren’t many people we could ask and even if we did ask another student, it’s not like they’ll know either because we’re all in the same boat. As a first year, you’re still getting used to the place and people. You’re being taught by people that have years of experience and are experts in their field. Then you get yourself, fresh out of school, barely knowledgeable in anything let alone the field you’re in. Over time it changed. Now I knock and walk in, and we have a good chat about life and then get down to work. You build up that trust over time I guess.”

Response from a female student:

“In my first year, I never went into a lecturer’s office alone. I was lucky that I had a friend from school in my course so when needed, we used to go see the lecturer. But only if needed, and I mean we would spend some time trying to figure out our problem first before even considering going to the lecturer. If we did end up going, we’d always let someone else know, like a family member or some other friends on campus. But here’s the thing. It wasn’t just for male lecturers, [but] we did this for female lecturers too. We feared for our physical safety with a male lecturer but with the female lecturer, it was more the intellectual safety I would say. That whole concept that was discussed earlier about not wanting to look stupid.”

The lecturer admitted to not being able to remember their first year but chose to respond with observations about the first-year students:

“I’m not sure if this will help at all but I’ve noticed that there is some hesitation and general all-around shyness from first-year students. Those same students over the years change how they behave with staff, myself included. They’re very quiet and formal in their first year, but as they get to know us and feel more comfortable in the department, they tend to become a little more casual when talking to staff. On the point of physical safety, I’ve never asked them why they’re quiet or nervous. I always just assumed it was because they were talking to someone new and senior and felt uneasy about that.”

The response from the lecturer suggested that lecturers are aware of the situation where students can feel nervous when interacting with staff members. The comments also aligned with what was said about how the students felt more at ease after some time, because of a relationship forming. It was widely accepted that over the years of their studies their experience of interaction and familiarity with staff members increased and as stated, it became easier for individuals to converse and engage with staff.

The next question was brought up to help define what the participants understood from the phrase ‘conflict in an office environment’. The definition included multiple different areas that could lead to conflict – ranging from physical actions to the more subtle act of passive aggression. All participants voiced their own understanding of conflict and collectively all added to an overall definition.

“Usually, people associate conflict with physical behaviour and aggression, and yes that is a type of conflict, but to me you need to include the non-physical more verbal type of conflict. When students engage with their supervisors a conflict of ideas can happen, which causes a little bit of tension.”

Conflict extends further than just physical violence. This definition can be simplified down to an engagement between more than one party, where one or more parties cannot come to an agreement.

It was noted that staff members are able to bring about conflict because of their status in the environment. They are the senior members in the interaction and as such could feel entitled to their opinion being right. This was displayed in the following extract:

“I agree with the previous statement. It’s not just about the physical conflict we immediately think about. There are also the passive-aggressive methods used by the staff.”

A follow-up question was made on why ‘staff’ was specified.

“Well in most interactions, you have people who lead the conversation and those who follow it. In most cases at campus it’s the staff that lead the interaction because they are senior and have experience in this kind of thing. This usually means that they control the tone and all that. Students are less likely to make remarks that seem passive–aggressive because they’re too afraid.”

Visible again, was the notion of feeling afraid - not for physical safety but for intellectual safety. During the discussion the lecturer only spoke about their observations of students but not about their current personal safety. When asked why there was a lack of comment on their personal feelings of safety, the lecturer indicated that they didn’t fear for their safety when dealing with students, but was constantly aware that they should act within the allowed regulations for the safety of others. This highlighted the point that there is an unspoken hierarchy during the interaction – the lecturer leading and the students merely following.

As the lecturer had mentioned regulations, the discussion was subsequently directed to institutional policies, specifically policies towards conflict. Policies are in place to help guide behaviour and actions for those who fit the criteria, whether it is an employee or someone using the services. In this case, the policy on conflict resolution and professional behaviour at the institute was highlighted. The group presented mixed results when asked if they had any prior knowledge of the policies in place. The lecturer had a positive result which is as expected, as a result of being an employee and personally being made aware of the policies through internal communication broadcasts from the institute’s administration. The students, however, faltered, with no recollection of policy announcements being received.

With interest now placed on the conflict policy, only the more senior students in the group were aware that policies are in place in the event of a conflict. Their reasons for knowing this ranged from personal interest, to having nearly been in conflict themselves. The student who indicated that they had been in conflict during their studies, said that they only searched for the policies to ensure that they were prepared if anything was taken further. The student who mentioned it was out of personal interest said the following:

“One day on the news I heard about misconduct at a university. They spoke about how the policies weren’t effective. It made me wonder if our institute had any such policies in place. So I checked around. It wasn’t easy to find, seriously. I looked through the institute’s website and couldn’t find it. I eventually Googled some keywords I thought would work and there it was.”

Professional behaviour works hand-in-hand with conflict. If you follow the regulations outlined by the professional behaviour policy, then conflict will be minimised (Society for Human Resource Management, n.d.). Just as with the policy on conflict, the staff member indicated prior knowledge of the policy, having cited extracts from it and even offering to provide the students with a copy if they so wished. The students followed the pattern with conflict, indicating that they were unaware of any professional behaviour policy but aware that there are general rules on professionalism in a work environment.

It is apparent that the institutional policies are not something that is clearly communicated to the students and is only sought after if the need arises. The students were aware that there may be policies in place as they form part of business regulations. However, they have not viewed said policies. Staff on the other hand, are made aware of these policies by other staff members and frequent communication from the administration.

Ending the theme of safety, one very distinct result was visible. A clear feeling of vulnerability in one gender and less so in the other. Females exhibited concerns about their own physical safety. They felt at risk when planning an engagement with a member of staff. Their awareness of GBV meant that they thought they may be a victim of misconduct because they are female. The males of the group showed fewer feelings of vulnerability, indicating that they took fewer precautions when planning an engagement with a member of staff. They felt less at risk when dealing with staff and are aware that it is so because they are male.

Figure 5 displays is the breakdown of the concerns of the sample in terms of safety. There are two categories, ‘Physical’ and ‘Other’. ‘Other’ includes, but is not limited to, intellectual safety and social status safety. Males presented no feeling of physical vulnerability and voiced concerns that fall into the ‘Other’ category. Females focused on physical safety but also included concerns similar to those presented by the males, but with less emphasis. Figure 6 depicts how the theme of safety was interconnected to the constructs defined in the framework. It has a close relation to social influence

and identifiability. Additionally, further breakdowns of social influences and identifiability display how the genders have engaged in those specific constructs on the topic of safety.

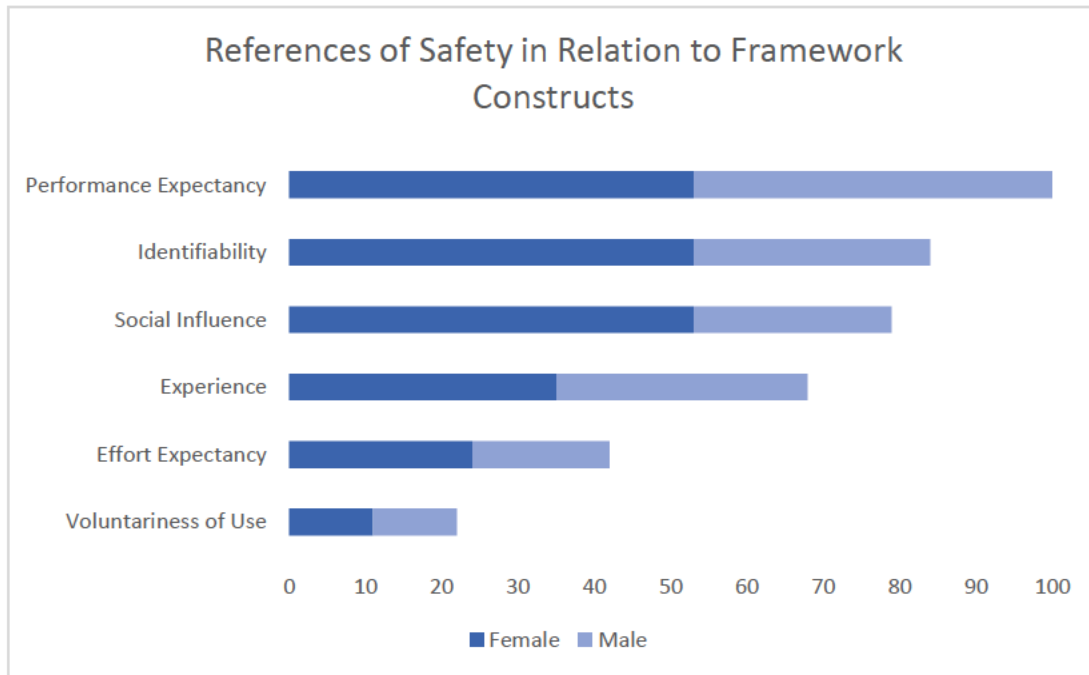


Figure 6: Measure of safety references to their associated framework constructs.

The lecturer in the group provided insight from the perspective of an observer, and highlighted that during the initial years of students' studies they approach the lecturer less, but as time progressed and they become familiar with each lecturer, the meetings started to become more frequent. This point was supported by all students of the group. It highlights the vulnerability all students felt towards approaching unfamiliar staff members when dealing with academic work in the earlier years of their studies. Various actions are taken by staff members to lessen that feeling of vulnerability and aid in putting the mind of the student at ease so that focus can be placed entirely on the content at hand rather than being wary of one's actions.

4.3. Documentation

The next theme to be discussed is documentation and the process of documenting the interaction. The appearance of this theme stemmed from prior research indicating recordings had been used solely for documentation. Documentation in respect of this research covers the areas of capturing and securely storing information of the interaction that is occurring. The information can be both digital and non-digital, and the storage method can be as desired by the individual. This theme aimed to determine what information the users felt should be recorded and logged. It also aimed to determine the type of

method for organising the information once it had been captured. Manual paper-based methods may be currently used. However, through process mapping, a digital system can be created to replicate the manual process.

Documentation questions were mainly focused on an individual's ability to generate accurate, concise, and thorough documents while interacting with others. Ranging from 'the fluidity of the conversation while making notes' to 'how notes are organised after the interaction is complete'. This, coupled with the actual content of what was documented, aided in determining the functional requirements of the artefact.

The initial question may seem like it only applied to the students. However, it can be viewed in a more general sense and become applicable to the lecturer.

“Can I please get a show of hands as to who makes notes during an interaction with a member of staff?”

The question prompted a simple binary response with 'Yes' or 'No' answers. All students indicated that they do make notes during interactions. The lecturer was asked the same question with no specification of it having to be with a member of staff. This implied that it was just a general meeting for academic purposes. The lecturer replied that notes are taken most of the time if it is academic-related. If a staff member is simply stopping by a fellow staff member's office to catch up, then there is no need for any notes to be taken, as this is personal.

“No one really documents personal stops, right? I'm not going to want my casual meeting with a colleague where I tell them about my sons' birthday the past weekend documented.”

From just the show of hands, it was clear that during academic meetings, notes are taken.

Following from whether notes were taken, the question of what type of notes were taken was then asked. Possibilities proposed were between digital, or paper-based notes. Responses indicated a mixture of methods. Participants not only stated that they have used one of the methods, but all except two participants have at some point used both digital and paper-based.

Paper-based methods were defended by the students as being tried and tested. They have a proven track record, being utilised throughout their schooling careers.

“All through history we have documents and manuscripts and all those things. They’re all written down and have lasted centuries.”

They explained how they were reluctant to switch to a new method of taking notes and organising it because the change was a big step. The extra overhead involved with converting old notes to follow the new system was deemed daunting, and an excessive amount of work – with not enough perceived reward. This concept of perceived usefulness was investigated further. There was complete agreement that if there was a new system being introduced and they felt that it was easy to use with substantial reward, they would consider it and possibly attempt to use the method.

Students who used both digital and paper-based methods agreed that the overhead involved with utilizing both methods was more than if they had stuck to just one method. Individuals indicated that at some points during their studies they could not find their notes. They could not remember whether it was a digital version or a paper-based version and that added extra work for them. Positive remarks were made about the use of digital notes, as they were seen as convenient and much easier to organise. Recordings and typed documents were grouped in folders, with labels and tags to aid in searching. The folders could be further organised and easily rearranged. Their direct comparison was to that of paper folders, with paper documents inside. They remarked that the arrangement of these paper documents proved more work than organizing their digital counterparts. When needing to store documents, physical space needed to be used. Constant upkeep of these documents is required and if amendments need to be made the document needs to be manually searched for by sifting through the folder to locate the specific file. In contrast, the digital version of this would be to simply search for the name, tag or label associated with a file.

The lecturer provided a more general overview of how students addressed the method of document-taking. The lecturer sees a variety of students and as each individual is unique, they have their preferred methods:

“I’ve seen students use mainly two methods for documenting. The main way most students use is the written-documents method. They walk in, get past the pleasantries of greeting, sit down, and pull out a book or exam pad and leave it on the desk to make notes on if they need to. The

other method is voice recordings. The student takes out their phone, opens some app and starts recording. Some ask if they can record, others just record without asking, and it doesn't affect me whether they ask me or not. I mean, it would be nice to be told but I'm not a stickler for that. Very few students use a recording device, you know those small devices that specifically record audio."

Being able to observe multiple students, the remarks by the lecturer helped gauge the bigger picture of how students interacted with staff during academic meetings. It should be noted that users being informed when a recording is taking place was highlighted by the group during this part of the conversation.

A question to investigate the current documentation methods was posed to the group:

"Would you call your system efficient?"

A response from a student:

"No, it's not efficient but it works for me. I'm not saying that it will work for everyone but over the years I've grown accustomed to my method. Admittedly it could be more organised like I said before, and I know for certain that would make my life easier, but I'm set in my ways right now and changing methods seems difficult. All my current notes follow my method and to switch to digital would involve remembering how to work with two separate methods of note taking and documentation, or, converting all my previous notes to a new digital method which is a lot of work."

Figure 7 displays the satisfaction students felt toward their current method of documentation. This considered the following metrics for the currently chosen methods: attitude; effectiveness; efficiency.

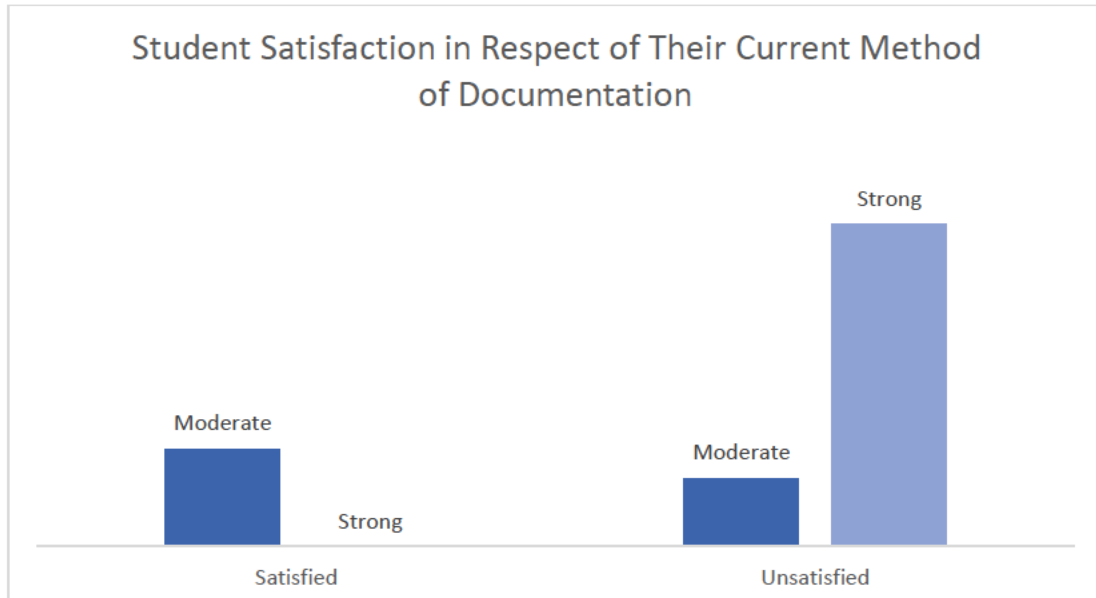


Figure 7: The satisfaction of a student in respect of their chosen documentation method.

In contrast, the following graph, Figure 8, shows the opinion of the sample toward the new proposed system. The new system was designed to incorporate some functionality to address the drawbacks of non-digital documentation methods. It was clear that students felt these features aided the process

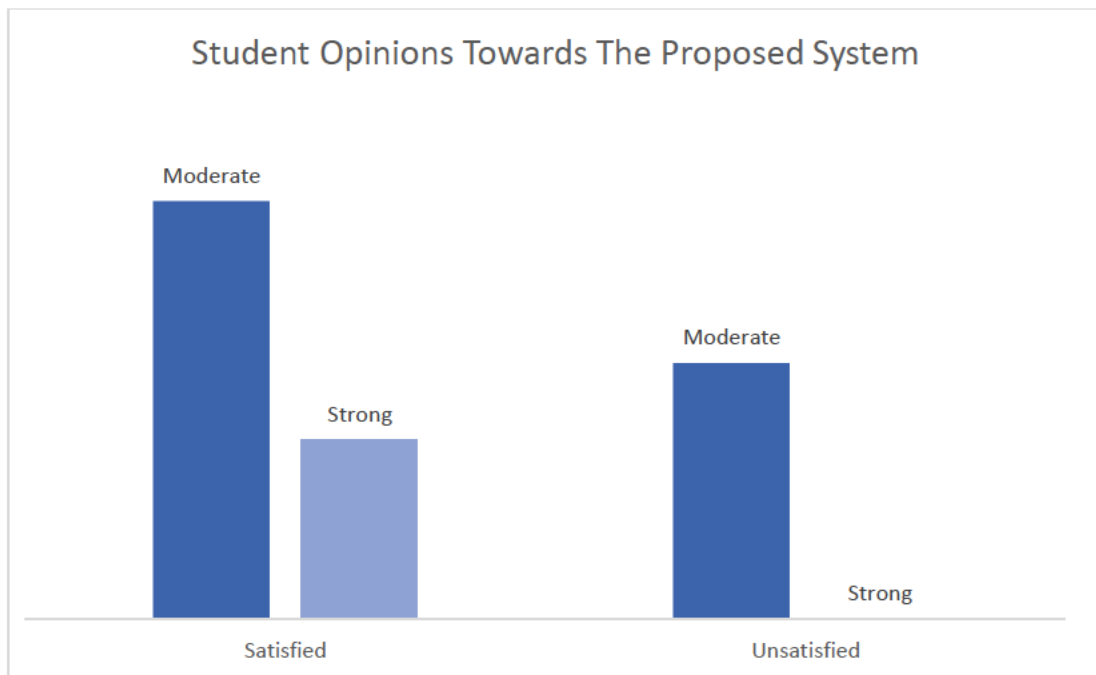


Figure 8: The opinion of students towards the new system

When asked about the ability to effectively make notes while engaging in the conversation, a pattern of being unable to accurately make notes while holding a fluid conversation was present among the responses. The task of taking effective notes includes, but is not limited to, listening to the content, understanding the content, processing the content, and then capturing the relevant data. Being able to determine what data is worthy of capturing is determined by the individual, however, this process of doing so requires some level of prior knowledge as only then can the individual decide what is important. Coupling this reasoning process, with that of formulating a response to engage in the conversation, is where individuals found difficulty. The lack of fluidity in responses prevents a natural flow of the conversation and could prevent avenues of discussion due to effort being required to note take instead of the same effort being used to generate an engaging response.

“In the moment, I don’t like taking notes. It breaks my concentration and flow. You can miss a point while writing something said previously. The problem is you don’t want to stop writing to listen because you’re afraid you’ll forget to jot down what was previously said so you’re forever in this loop of writing about what was just said while listening and responding to new content while attempting to phrase it to write down.”

As there was difficulty in being able to effectively create notes based on the current discussion, the level of detail of the notes was compromised for multiple reasons. The students had a general lack of professional note-taking knowledge. This could include courses on how to conduct note-taking or minute taking for meetings, of which the students have attended or had training in neither. Prior institutions during schooling careers showed a lack of training on how to effectively make comprehensive notes for a meeting or interaction, thus allowing students to uncover a method that works for them. Students indicated that these methods changed over the years due to experience, and trial and error, culminating in a summarisation method unique to the individual, but one that is not necessarily the most effective. This uniqueness included post-meeting document management, however, work towards expanding the notes and contextualising the information in the notes was required. This expansion and contextualisation process was necessary as students who relied on their memory unsuccessful in recalling all the information. An issue presented for this method is that between capturing the information during the meeting and reviewing it directly after the meeting, some thoughts and understanding had already been lost.

“...half the time I’m fairly certain I forgot things because days after the meeting I’ll randomly remember something related to the meeting that I knew I was supposed to write down, but I had forgotten to”

In contrast to the lack of detail, there was an overabundance of detail by one student. This high level of detail still affected the interaction of fluidity of the engagement as noting all the details consumed time; time which could have been used to process and formulate a thought-provoking response to better understand the content. Focus was placed on the documentation to preserve the content discussed, however, the quality of the content discussed was compromised due to this.

To further explore this point of detail, students were asked what changes they would make, if any, to their documentation style. This question was posed primarily to the individuals who conducted paper-based documentation as it was them that had trouble managing their current method, however, all students responded. This suggested that even though technology was being used by some students to aid their methods, they still felt it could be improved in some manner. Attempts to make changes to their methods have been made, however, not all attempts have been successful. In the cases where it was successful, it was adopted and incorporated into the future occurrence of documentation from that point forth.

Delving further into detail, when students were asked to describe the identifying descriptors associated with any interaction in an office environment, a list of commonalities was uncovered. This list included the full details of all parties present: name, surname, and student or staff number. Date and time, location, duration of the meeting, with meeting end time being implicitly included.

Each field in the list was further analysed. It was discovered that instead of just being able to “insert” the details, these details should either be automatically captured or selectable from a prepopulated list displaying relevant data. This feature requires access to the central database which stores details of all associated individuals. In this example, the database would contain all details for students and staff associated with the university. Having this ability will ensure that details are accurately captured, lessening the possibility of human error. These attributes collectively contained enough information to describe key points of the interaction that occurred.

“...looking at these points it kind of makes sense. Putting all of them together paints a whole picture. Who was there; where and when it happened; what was discussed; and what time it finished up?”

The breakdown of the proposed attributes was uncovered through a process of trial and error by the students. As established, none of the students had attended any formal training in documentation methods and any details they had noted in their documentation were purely based on the fact that they thought it worthy of being noted. These styles have risen through observing others and through experimentation.

“No, I haven't taken any courses. I've really only learnt how to take notes from what I've seen people do and been taught in school. Write down key points and use that.”

In contrast to the lack of experience by the students, staff indicated that during their professional careers, they had participated in formal training on documentation methods. Relying entirely on memory of their experience as a university student, no recollection was made of having participated in any formal training during that time. For the staff, any formal experience that took place was done so during their professional employment and had been a regular occurrence since.

The content of training sessions often included areas such as style of writing, formatting, content to capture and administration. This was training for what processes need to be carried out during a meeting, however, little mention of post-meeting processes was made. Students often have meetings in groups and during that interaction, the process of documentation differs according to the group. The most common method stated was for all individuals to take notes and discuss the notes after the meeting to refine and finalise the different views. Second to that was the process where one individual was designated to take notes of everything happening while not engaging in the interaction unless necessary. Students who had attempted this method indicated that post-meeting reviews fail in comparison to if all students in the meeting were to take their own notes. This is not only because the notes were being made entirely from one student's perspective and ability to make notes, but because of their ability to coordinate and distribute the notes thereafter. The individual designated to document the content would be required to contextualise the notes as other students would be viewing the notes for the first time after the meeting.

The group agreed that post-meeting organisation was just as important as the content. A method to help organise the documents collected after the meeting should become the norm, as well as the distribution of the recorded information.

“...and if you can’t organise the notes you’ve just taken, it wouldn’t be of any use to you. You could have the best skills in processing what’s important and making a note of it, but if you can’t arrange it in a manner where you can find it easily and review it, then what’s the point?”

The students listed a few methods for organising their notes. Paper-based documents were categorised first by module, then by topic, and then by date, as shown in Figure 9.

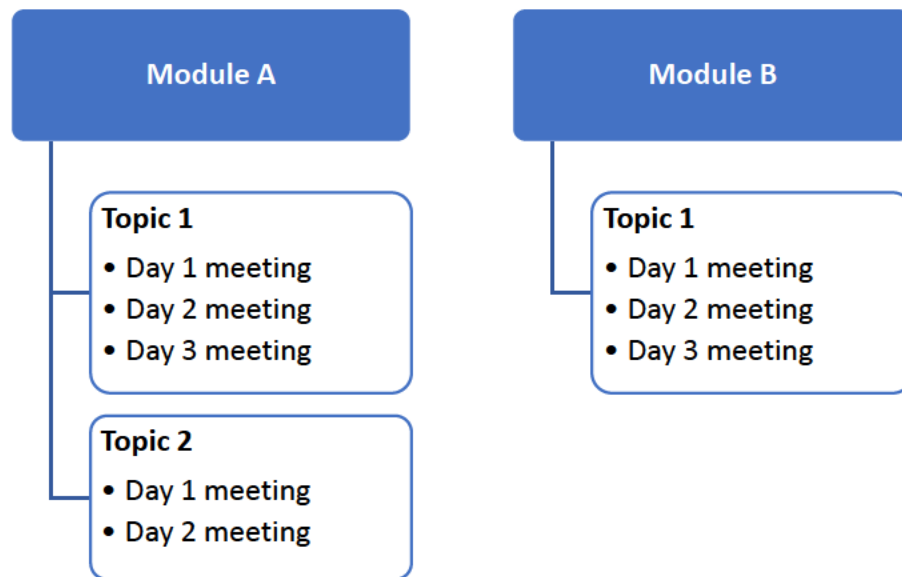


Figure 9: A visual depiction of the organisational structure used by students for their paper-based notes.

Paper and electronic methods were categorised in the same way, displayed in Figure 10, with references to the electronic versions noted on the paper copies. The overhead involved with organising the two sets of notes was deemed unrewarding to some, and as such, they reverted to purely paper-based methods. Others who saw some benefit from using both methods stuck with the process and adapted to the overhead efforts.

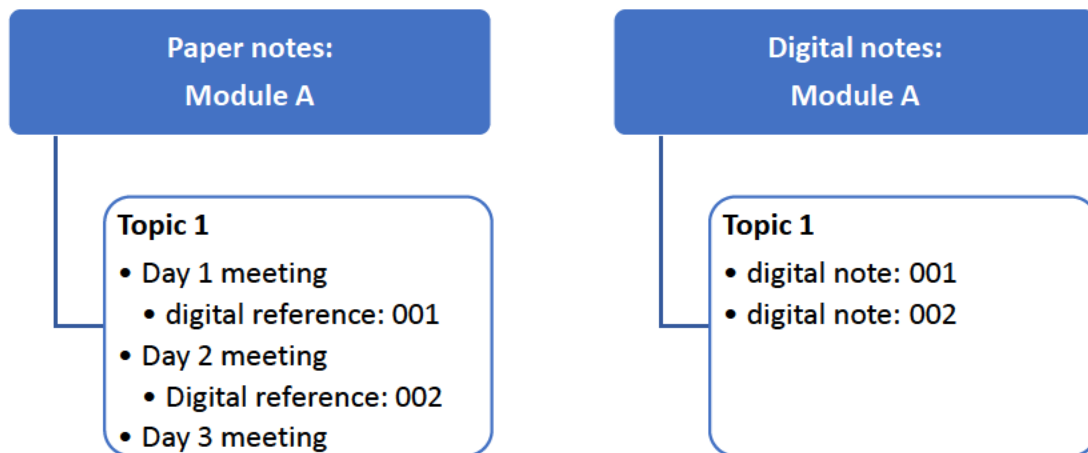


Figure 10: An overview of the organisational structure used by students for a combination of paper-based and digital notes.

A tagging system had been used for both methods. Aside from the hierarchical order of categorisation, tags were associated with the notes based on keywords. These tags reduced retrieval times when the documents were being requested and improved overall productivity, however, this was reliant on one's ability to meaningfully tag the documents during the organisation process.

The organised notes not only consisted of what was noted down during the interactions, but also contained additional notes created outside of this context. Notes created during lecture sessions, tutorial session and personal betterment were all grouped together. The resulting structure was like that depicted in Figure 11.

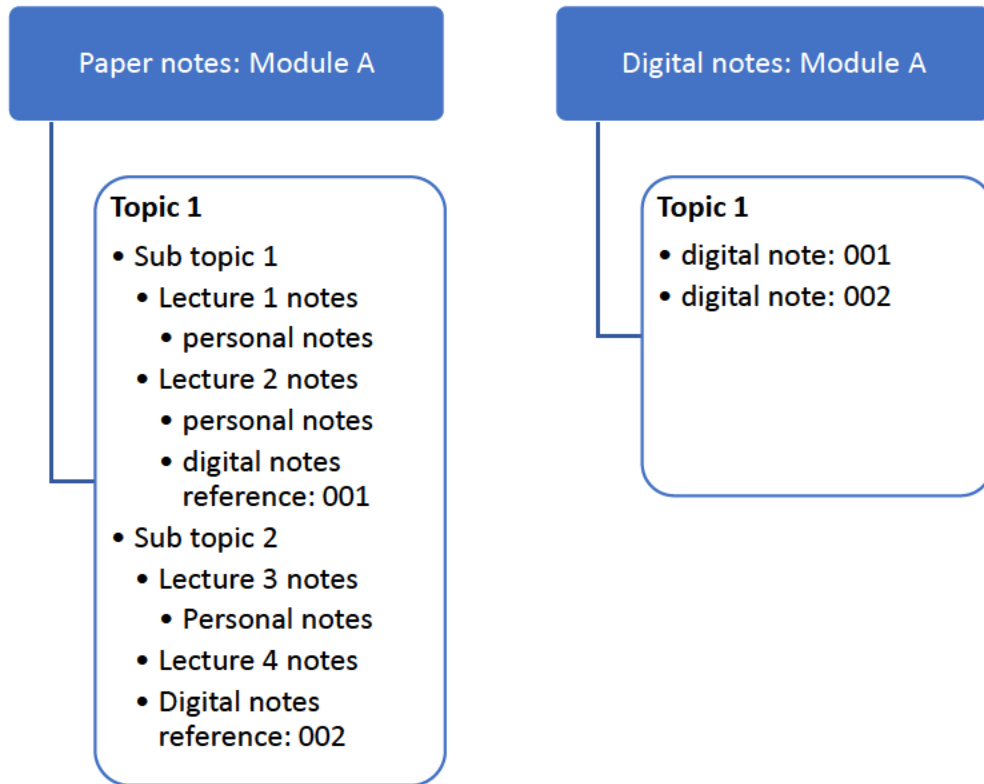


Figure 11: A detailed visual depiction of the organisational structure used by students for a combination of paper-based and digital notes.

As visible, there are multiple sources of input for documents, and the overhead involved with organizing the notes was perceived to be excessive by some and confirmed as excessive by others with prior experience. Visible through the different methods, a pattern has emerged: the more methods of documentation being conducted by an individual, the more work is required when organizing the notes. These methods of input were not fictional as students indicated that personal notes were made to deepen their understanding of topics. The information provided to them was not always clear and sometimes lacked adequate content, and as a result, students searched for more information. As students progressed further into their studies their knowledge base grew. This was because of specialisation and depth in specific areas of their studies. The knowledge base thus needed to be effectively organised to be adequately useful.

“I do it because I’m not really happy with the content that’s provided to us during lectures. It’s very basic stuff and what gets asked during tests and exams is much more detailed than just the stuff we go through in lectures. Plus, it helps me understand the content much better.”

It was clear that there isn't a lack of opportunity for professional training in the documentation process as the institute offered short courses. The failure of satisfactory documents was due to a lack of emphasis placed on the process of documentation. As mentioned, there was a visible gap in this area during the early years of one's schooling career. This was the time in which habits and methods were developed. What was indicated by the students, as well as the patterns uncovered, was summarised clearly by the lecturer in the group, as the lecturer shared the same sentiment toward the students note-taking during meetings.

"I have noticed a few things. With written notes, the students almost always struggle to follow the conversation and keep it flowing. Their focus is split between listening to and absorbing what's being said, and listening and writing it down. While they're writing, I think some find it difficult to process what's being said, so they make their notes, process it, formulate some sort of response, and then follow up. It's a very unnatural way of having a conversation. They're here for a better understanding of concepts but to do that I feel like you must have a clear and flowing conversation to dig into the real talking points and explore all areas. If you are making notes, those are more surface-related type of notes, touching on the basics of the concepts and you don't have that free flow thought process to think up ideas and ask about them because you're more focused on writing things down.

4.4. General

The general section is aimed at addressing the minor areas uncovered during prior research and covers many further concepts. Such concepts include behavioural alterations, digital security, and general technology literacy.

The initial question investigated an individual's feelings towards being recorded. A few notes should be made: no context was provided; the participants could interpret the environment in their own regard. The second is that this question was posed as the role of the individual being recorded, and not the one conducting the recording. Lastly, the recording could occur in either a video or audio format. A distinguishing factor was made which identified two separate scenarios for recordings. The first being whether they were being recorded around friends and family, the second being if they were recorded in a more formal environment. A difference was noticed in the behaviour during these two separate contexts.

When interacting in a less formal environment, students indicated their behaviour to be that of a more natural style, being unaffected by the fact that a recording is occurring. They had this understanding that the recording was not going to be viewed by the public and due to that restriction, they were able to behave as if there was no form of recording at all. In comparison, when in a formal environment, the behaviour of the individuals changed, as they knew that the recording could be viewed by external parties. Some likened this sense of ‘acting for the situation’ to a graduation ceremony:

“I think the best way I can describe the difference is using graduation. During the graduation ceremony on campus everyone is formal, dressed in their suits with the graduates’ wearing robes. The students followed the rules throughout the ceremony because they knew they were being recorded and that they were being watched by people who they don’t know. Now after the ceremony, when they go out to celebrate with friends or family and people are recording, they don’t care too much because its people they trust”

The lecturer in the discussion concurred with the students, suggesting that on some subconscious level the knowledge of being recorded may have affected the behaviour of an individual, even if they had no objection towards the action. Over their academic career there had been multiple events where a meeting had been recorded, but the effect it played on the behaviour of the lecturer diminished over time, suggesting one becomes more at ease with the concept of being recorded.

The lecturer’s comment:

“... After a while, I suppose you just get used to it and it affects you less.”

What the lecturer failed to confirm was whether their behaviour outside of the recorded interaction changed. This question was asked to establish if there was a definitive feeling of being unaffected by the recording, and it was not definitive. Some students did confirm a change of behaviour when being recorded. This change was entirely based on the situation. In the event of a meeting, they attempted to improve how people perceive them by using better grammar and vocational methods.

“...but rather just trying to make myself seem, better. I’d choose my words more wisely trying to seem smarter. I’d purposely try to make my speech clearer too, to be heard properly.”

In the context of university interaction, the understanding of why an interaction should be recorded was met by all, as they felt it provides an extra layer of security. The perception of the users was that

having the knowledge that all the events of the interaction were being logged, helped the involved parties feel safer in knowing that if any problems arose, there is proof. The concept of proof was mentioned frequently as students felt that their word carries less weight than that of a staff member. The underlying issue for this reasoning was again, upbringing. Students agreed that there is a social hierarchy where the word of an adult is usually the truth, and children are prone to lying to get out of trouble. Without knowledge of the correct procedures for conflict resolution, this underlying issue persists as prior cases have followed the same path (Toppo, 2018).

“In several recent cases, presidents who mishandled abuse cases made one key error, said Susan Resneck Pierce, president emerita of the University of Puget Sound, who now serves as a consultant to presidents and trustees. She said they hadn’t created a campus culture in which it was expected that they’d be informed of allegations of inappropriate behaviour.”
(Toppo, 2018, para. 4).

The group agreed when asked if they wanted to be informed of any recording being conducted. This contradicts the statement made earlier by the lecturer, indicating that being recorded doesn’t affect their behaviour. When shown the contradiction, the response to explain the differences suggested that understanding why the recording was taking place was important. The reasoning behind the recording did not affect the approval of allowing the recording. The reasons were always understandable and benefited the individual requesting to record. The perceived risk towards allowing the recording was minimal and as such the recordings took place. The perceived safety of the parties involved increased when they felt that their actions were being recorded and could be supported if allegations were made.

To further gauge the level of perceived safety, a hypothetical situation was presented. One in which the recording was automatically conducted by a neutral party that logged all essential identifying details and that was stored on an external neutral server which only authenticated users could access. The files could not be deleted without the appropriate level of access and only those associated with a particular file could access that file. The perceived safety of the parties involved increased further when they were introduced to the concept of automatic and constant recording on a neutral storage location. The concept of a neutral online location was questioned further in respect of the understanding of such a concept among the participants. There was visible interest in such a system being described in the hypothetical.

For most of the group, their excitement about the proposed system was merely perceptive as they believed it would be beneficial. They understood very little about the intricacies regarding the workings of the system and the system requirements, only that it could aid them both in safety and academic work. Only one of the participants had experience in the digital sector, with knowledge of systems and cloud infrastructure for storage. Their view on cloud infrastructure was positive, because of research into the topic and first-hand experience with it. The security of the files themselves was also discussed and was determined as a must-have. This helps prevent unauthorised access and distribution. Whether it is through encryption or copy prevention, the files need to have a layer of security over and above the security associated with system access. Most of the group understood the concept of security as being limited to user access and have heard the term “encryption” before but provided very little in the way of an explanation of what it is. Individuals who had worked with file vaults and password protected files, understood it as being a doorway that one needed to unlock before accessing the file.

“I’ve used file vaults previously and if I were to compare it or try to explain it to someone, I’d say it’s like having a lock on a filing cabinet. You can’t access the files without unlocking them first, right?”

Some merely understood digital security as password-protected access, to the extent that passwords should be difficult to identify.

“... passwords should be cryptic and not be your date of birth or ID number or anything personal to you.”

The lecturer involved brought in the topic of policies for digital security. Mention was made of policies and regulations regarding how to interact with the institution's technology, with details of what actions are not allowed. The students then realised that they have seen mention of rules regarding conduct in the computer labs on what can or cannot be done. It was visible that the students were aware of what actions they can perform, however, the association between these rules and digital security was not made, implying that they did not understand the deeper context of why these rules were in place. This suggests that they followed the rules only to monitor the rules set by the institution, without being informed of the reasoning behind their implementation

The rule most remembered was the use of external flash drives. All individuals at some point during their academic career admitted to having inserted a flash drive into a university computer. It supports the notion earlier discovered that cloud storage was new to many of the individuals, as many still relied on physical storage devices. Some have had experience with the OneDrive storage provided by the university, others with Google Drive or iCloud. After a brief explanation of cloud storage there seemed to be a general sense of approval due to its functionality and ability to be more portable than a flash drive, however, security concerns were voiced. This was because not many users understood how security worked for cloud storage. Their belief of it being out of their personal control was something they would consider when choosing what to store online. Knowledge of the topic is what divided the users. Those who understood how cloud storage worked indicated a preference for using it, however, those who knew of it but not the workings of it, chose to stick with a physical storage device. Understanding seemed to be the key factor in helping individuals consider the new technology.

Technical knowledge was also lacking in the individuals as only one participant was aware of large-scale security breaches that had been in the news. When asked about knowledge of the cloud hack events that occurred recently, there was a response from only one participant. This individual's field of study was in the IT sector and as a result, provided some background as to why they investigated IT related news.

This lack of knowledge was further established when those individuals who favoured cloud storage were made aware of the drawbacks and recent failures of cloud storage security - particularly the PlayStation Network hack (Sinclair, 2021) and the iCloud hack (Lewis, 2014).

Access to a cloud storage space was another area of concern as it requires an internet connection to send and receive files. Internet access can be made through multiple different platforms and as a result, is important to determine the most common type of platform being used at the university, as well as what is perceived as the most effective platform to use. To rank this, effectiveness, efficiency, and functionality were used as performance metrics to decide on a platform

Participants listed cell phones, tablets and laptops as the most common devices used for internet access while on the institute's premises. The local computer labs provided desktop computers for network access however these labs had with their respective list of problems, ranging from accessibility to lack of availability.

“I almost always have my cell phone on me whenever I go anywhere, but my laptop stays in one place usually. Like at campus, I have my laptop with me but if I were to go into a meeting, I don’t always carry my laptop unless it’s necessary, but I do always carry my cell phone. It works the same as my laptop and I can use it to google anything or jot down some quick notes”

Portability was the resulting concept from the above response, with most responses indicating that smaller devices were preferable. Devices starting with cell phones and tablets, then ending with laptops. Efficiency proved more difficult to narrow down a clear preference as the efficiency depended on the task at hand. When dealing with general web browsing and accessibility, mobile devices were the first choice, however, when handling a more resource-intensive task, a laptop was the first choice as it provided a large area to work with while having more functionality relative to the task. For example, when editing a document, the physical keyboard on the laptop trumped the digital keyboard on a mobile cell phone. Tablets provided a compromise between all the devices as they traded off more screen real estate than the cell phone, but for a slight decrease in performance when compared to the laptop. Functionality, after discussing efficiency, was dependent on the task in question. All devices did fall victim to the issue of usage time. Each device relied on battery power and had a difference in their maximum battery life.

For students, the most common device was determined to be the mobile cell phone. Due to the wide variety of available options, this made it more feasible for all students to use. With the introduction of the recent partnership between institutions and technology providers, laptops have become more accessible than before, however, they still fall behind due to the technical literacy of the user. The less-informed users found it difficult to choose a laptop over a cell phone as it was considered a large investment.

Cell phones fall victim to having less storage space than laptops, however, this is counteracted by the use of online storage. The files are not stored locally unless necessary and as such, the requirement for larger storage would be voided.

4.5. Necessity

It is at this point in the discussion that the participants were introduced to conceptual models of the system described in the hypothetical situation described. These models displayed interfaces and system structure but were simple enough to allow all participants the chance to understand them. This

system was prototyped on a mobile device as secondary research indicated it is the most widely used and accessible among students (Abeele, 2020).

This section was used to determine a potential user's opinion on the proposed system. It discussed topics such as the necessity of said system, as well as what possible functionality it could include.

The observed behaviour of the individuals, when introduced to the hypothetical situation, was coherent with the behaviour displayed upon being introduced to the proposed system to monitor student and staff interactions. This system saw the interest of all individuals increase. The more they understood and asked questions, the more they felt that the system should be implemented. The observed actions, vocal tones, and body language indicated a sense of intrigue and excitement towards the system.

As previously displayed during the discussion on perceived safety, there was an observable show of interest in the system, with initial comments being about the ability to quickly understand all of the screens as depicted in Appendix C.

“In some app’s there’s just information all over the screen. It’s too cluttered and difficult to figure out heads or tails of what’s happening on the screen.”

The other participants agreed, with app interaction playing a big role in its long-term use.

“Some apps have nice layouts, but the tapping of certain things gets annoying because the buttons are so small! I know I’ve removed some games because it wasn’t tapping where I wanted it to.”

Participants indicated that for them to be satisfied with the app use, it should be easy to use while not being overbearing. If interaction with the app is complex, then the usage time of the app is lessened due to the individual not wanting to use it. Instructions should be clear and concise with an adequate amount of information on the screen, but not too much to overwhelm the user. The level of interaction was brought up by a student as this also played a part in their preferences. If an app required too much interaction for simple tasks, then it would be used less. The app was required to automate certain processes, which in turn, decrease the interaction between the system and the user.

The level of interaction for this system ranged from none to minimal. This was because users believed that if it were to be believable when being scrutinised in the event of misconduct, it should not have had the chance to be interfered with by any user. The system should be fully automated, but if not possible, any interaction with the system should be logged and timestamped, with the user's details being associated with the interaction to identify the individual.

“...like an audit trail. It would log who made changes to the system details, when it was made and maybe even why it was made. If someone is changing the data, there better be a good reason.”

Clarification was made on what type of changes could be allowed to the system process. When instructed that the system would fully automate the process of identifying the involved parties, the date, time, and location, the individuals felt less inclined towards needing an audit trail. This was because they understood that no changes could be made to the system process. If there was a need for minimal interaction, then the audit trail was agreed upon by all participants, however, there was a lack of definition on how the individuals identifying information would be verified.

A prioritised point made by a student was that of consent. The users would need to consent to the recording process before having the recording started. This is a legal matter and as such laws and regulations should be considered when attempting to implement the system. Issues relating to ‘how long the recordings are stored’ were also brought up, as students believed they shouldn't be stored forever or even after an individual has left the institution. The storage duration would need to be disclosed when providing consent. Students were also curious about what else the recordings will be used for.

“Besides the opportunity to review it for academic purposes and legal proceedings, could the information be used in data mining?”

As the recordings would be stored on a secured cloud server, and due to the purpose of the system, identifying details would respectively be stored and protected. In the event that the information is being used for any research purpose, consent would need to be provided for this too. Consent should be intertwined in the system's operation as without consent the system should not be operated.

Addressing the issue of necessity, the participants were asked how important such a system is, and if it will provide any tangible benefits to them. All participants agreed that the system is necessary, however, some felt conflicted due to the concept of privacy invasion. Concerns also included the level of queries, including false queries, that could be brought forward. An example provided by the lecturer:

“If I have a student in my office and we’re chatting, and everything is fine with the recording being done. What happens is the student comes back a few days later having lodged a complaint of misconduct but I am unaware of any said allegation or infraction. I thought I did nothing wrong, but this student thinks otherwise. Perhaps to the student, it was offensive but for me, it was not. Where do we draw the line on what can be logged as an allegation that requires review? With this system, we would have the opportunity to review everything as it is always recorded and stored securely so the legitimacy is undisputed, but is there a need to review all? What are the standards and regulations for using the system?”

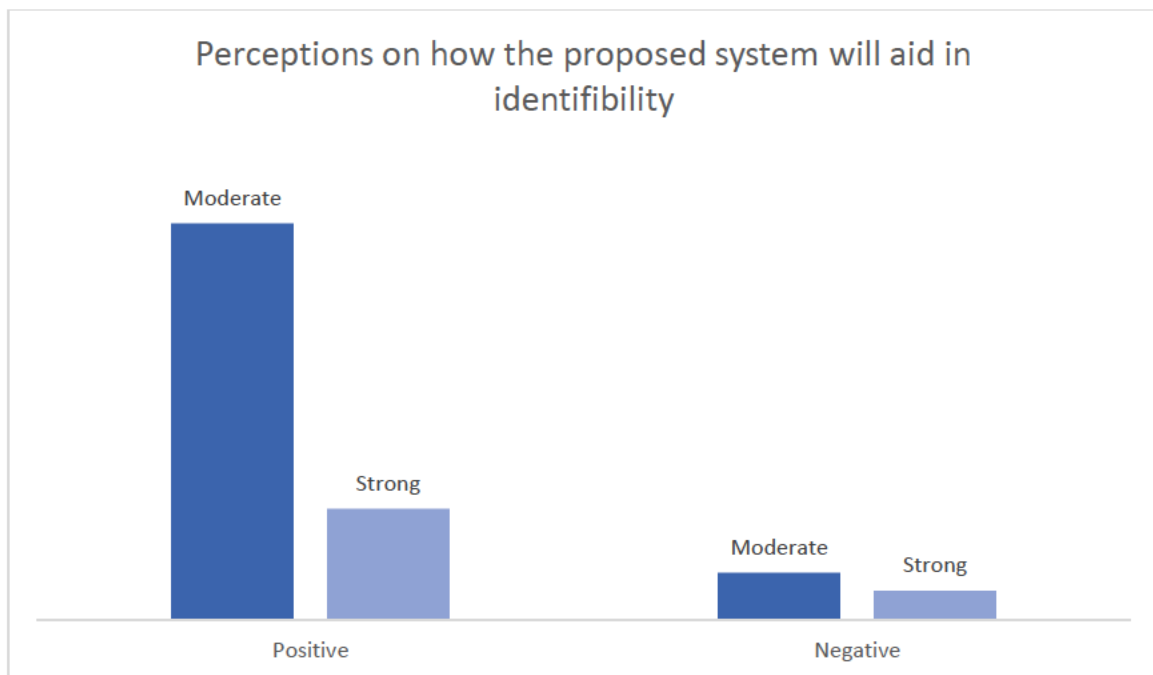


Figure 12: Students’ perceptions of the increase of identifiability provided by the system.

The point brought up by the lecturer indicated concern about expenses once the system has been implemented. Expenses in the form of time and status. If a false allegation was made then disproven,

the allegation was still made, and could possibly attach a social stigma towards the involved parties. A student suggested that guidelines be provided for the use and operation of the system.

“Just like with any system, there are terms and conditions that need to be accepted by someone before they can use it. These terms could include the regulations that we’re talking about.”

Necessity was also deemed important by a few participants, purely from an academic standpoint. These individuals believed that it could allow for follow-up reviews of any interactions and help in deepening the understanding of what was discussed. Others felt that it wouldn’t be beneficial as if an individual lacked understanding of the concept during the meeting, the post-meeting review wouldn’t be any better. This was if a post-meeting review were to occur.

When asked about the general functionality of the system, users provided some additional features they thought could be of use. One suggested allowing for video recording instead of just audio, as this will capture the visual aspect of the meeting and provide further proof in any investigation. One user questioned the current functionality of the full automation.

“Why does the system need to activate for all interactions. Surely there are times when people, not specifically staff and student meetings but maybe staff and staff meetings, don’t want to have themselves recorded? What about the confidentiality of whatever was discussed during that meeting? Maybe some lecturers are discussing a new project or paper and don’t want this information getting out. Having the recording going on in the background is a means of letting the information get out where if there was no system, it wouldn’t have.”

It was evident that this individual distrusted the level of security associated with cloud storage. This distrust stemmed from a lack of understanding of how cloud security operated. When asked about the level of security of files on their personal device, participants suggested that they keep their devices secure. Not allowing other people to look through their devices, protecting important files by putting passwords on them or hiding them in folders somewhere unusual. Not visiting any malicious websites or downloading unusual software which could compromise their device. Users seemed to be aware of the basic protective measures.

Participants were asked to provide opinions on whether local storage is better than cloud storage. There was debate and no clear solution was decided upon. This was because the type of storage

required seemed entirely context-dependent. When understanding this context of the system, users agreed that cloud storage would be preferable.

“Cloud storage would probably be better. It's accessible from anywhere or on any device, which is great. I'm not stuck having to use just my phone or just my laptop to listen to the recording. If my battery dies on a specific device, then I can just use a different device because it's online.”

Cloud storage provides greater versatility as access can be made from different devices. Access can also be provided authorised parties. Local storage would prove difficult as access is restricted to just that device unless copied across to another, and distribution to other parties would be required to be done manually, again through the copying of the file.

In addition to the automation of the recordings, another member added that there could be social ramifications:

“These recordings could be used to name and shame and ruin someone's reputation. Not only in the case of the recording being downloaded and distributed where the offender is identified, but where an individual gets ridiculed for saying something silly. If I said something silly by accident, I wouldn't want it getting out. Anyone could use it and ruin my reputation, it's probably worse for established lecturers and staff.”

This line of discussion seemed to have sparked some thoughts with the other participants, as one mentioned the area of mimicking a police state. Cambridge dictionary defines a police state as “a country in which the government uses the police to severely limit people's freedom” (Cambridge University Press, n.d.), the keywords being “limit people's freedom”. When introducing a recording system into a free society (Butler, 2013) there may be push back, as those opposed to being constantly supervised/monitored may object.

“We live in a free society right, so we have the choice to do and say what we feel as long as it's within the law. I don't break the law, but I obviously don't want someone watching over absolutely everything I do, scrutinising what I say and bringing up menial issues which could ruin my reputation”

Another individual mentioned conflicting consent between the involved parties. When parties meet and one wishes to record an interaction, what would happen if another involved party denied consent? This introduced the area of authority. Who is the leading authority when in an interaction? Would it be the university, the most senior member involved or a majority vote?

Further functionality requested involved a tagging system where recordings are tagged based on easily identifiable keywords. Depending on whether the system is automatic or manual, these keywords need to be determined by the system or manual inserted. A name for the recording should also be allowed to further ease the identification. This discussion suggested that when the system stores the recordings it should do so in an organised manner. One in which it is easy to find specific recordings. In this instance, separation according to the module was recommended by the individuals, however, system design could include separation according to any attribute the user requires (date, module, party involved, etc.).

As evident from the discussion after introducing the conceptual models, the system was deemed a necessity. The general functionality of the system is agreed upon and supported by the participants, where it will record interactions and store them securely online, however, issues regarding the implementation of the system were undecided. These issues included areas of consent and automation.

4.6. Systematic analysis

A systematic analysis process should occur iteratively until saturation occurs, which in this instance is concerning the functionality and system design. The systematic focus group discussion occurred after refinement of the system was made and this discussion focussed specifically on the recommendations proposed by the sample. Appendix B-2, B-4, B-6, B-8 were presented to the sample upfront for them to explore and understand.

Similar to the Delphi Method, saturation was reached for the opinions of the focus group. The Delphi Method relies on a panel of experts, whereas this research utilised potential users of the proposed system. The following areas were addressed during the iterative systematic process. The area of consent was the primary topic, thereafter the area of distribution was to be discussed. Lastly, the functionality additions were to be addressed. This functionality includes previously mentioned concepts of the search and organisation feature, the local storage process, and the availability of the guidelines.

Having made refinements to the proposed system between rounds of discussion, the first area that was addressed was that of consent. As no consensus was reached by the participants initially, the proposed system design prioritised the user's consent over the enforcement of the system. In this manner, the parties can discuss the idea of recording the interaction amongst themselves and if agreeing upon conducting the recording, utilise the system. This adjustment was explained to the participants, who agreed with the changes and the reason behind implementing them. It was suggested that this design would help the system adoption as they themselves would accept it in this manner.

“I'd rather have the ability to choose when I want to be recorded than constantly being recorded. Would feel like I'm in an episode of Big Brother otherwise”.

This was a sentiment shared among all participants. What was noticeable is that the female participants brought forward the idea of recording without consent, and it was subsequently discussed primarily by said female participants. This could indicate that females are more concerned with their safety than males as they entertained and discussed the idea of constant recording at length.

With regards to the distribution of the recordings, there was hesitation towards allowing the sharing of the recordings, as some participants feared being ostracised socially. This was due to the belief that there may be an event where an individual says or does something to affect their social reputation and

it is recorded. If this recording were to be released publicly it would be detrimental to their reputation. With this requirement incorporated into the system design, the recording could be designed to not be downloaded or shared, and only playable through a streaming service in the system. All participants felt this was the best method to ensure the integrity of the recordings and this social reputation, however, soon changed their mind when discussing the final area of additional features. The final verdict for a streaming only feature was dismissed and now the incorporation of offline playback alongside a streaming service was agreed upon.

The final area addressed was the inclusion of additional features. The first feature was to incorporate a search and organisation feature for the recorded files. This would aid in the location of specific recorded interactions. The organisation feature would allow for the managing of recordings according to criteria the user defines. Be this by module, by date, by location, or any other detail captured. Local storage is part of the system's core design as constant internet connectivity should not be a necessity. The offline accessibility of the system should be prioritised due to levels of internet bandwidth penetration (International Telecommunication Union, 2017). To properly allow for offline playback, the recordings should be playable only through the system. It was at this point that the participants were made aware of their earlier statement requesting a streaming-only service. Understanding the contradiction, acceptance of offline playback through the means of downloading and local storage was now provided. Recommendations for securing the locally stored files were also made. Online storage was subsequently discussed further as new insights were made into the online storage location. As a member of the institution, individuals are provided with a personal online storage location in the form of a 'One Drive cloud storage' space. This space could be utilised to store personal copies of the recordings.

The last feature was to ensure that the policies and guidelines for the system's use are available through the system. In this way, the documents are in a central, easily accessible location. Both staff and students came to the understanding that this accessibility to important documents would be beneficial.

4.7. Relational analysis

Further relational analysis was conducted on the data gathered to determine how the distinct themes uncovered related to each other. This step was important as it provides an in-depth understanding of why users may have felt the way they did and how the concepts they discussed possibly supplemented

each other and reiterated the theme. This analysis will provide a more overall understanding of the data.

In secondary research, the major themes discovered were safety, necessity, and productivity. Uncovered during the discussion was the important concept of consent, relating to the construct 'voluntariness of use'. Although important, less time was spent discussing the concept of consent, or 'voluntariness of use', when compared to other constructs.

Consent related directly to the adoption of the system and users suggested that if not given the choice, they may oppose the use of the system as no level of privacy is allowed. Analysis of the constructs depicts 'voluntariness of use' as being the lowest factor influencing the intention to use.

Focussing on the dependent variables, Figure 13 depicts how the discussion time was spent for each of the dependent constructs. It shows all the dependent constructs and how each of the independent constructs is associated with them. Performance expectancy consumed a large proportion of the discussion (39%), followed closely by identifiability (32%), then social influence (20%), and lastly effort expectancy (9%).

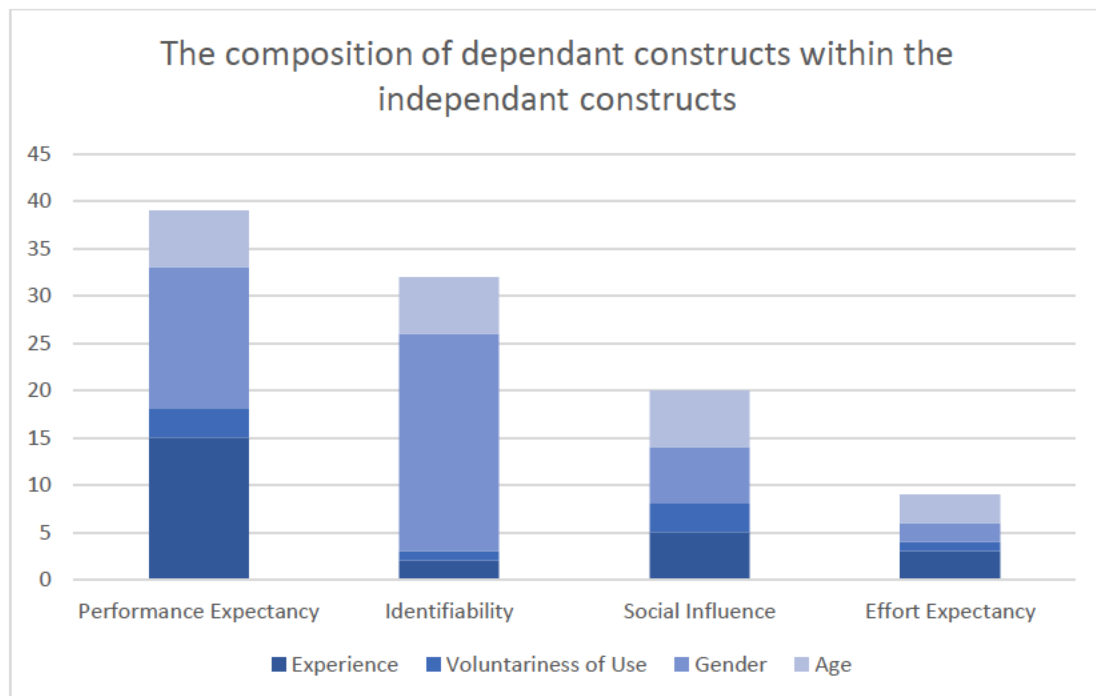


Figure 13: A graph depicting the composition of the dependant constructs and their make-up of the independent constructs.

Incorporating the research framework design, we are able to see the extent to which an independent variable affects a dependant variable, as shown in Table 2:

Table 2: Analysis of the independent constructs and their effects on the dependent construct .

Dependent	Independent	Effect
Performance expectancy	Gender, Age	Equal effects from both male and female students, however, there was also a strong effect from younger students.
Effort expectancy	Gender, age, experience	Stronger effects from younger students, specifically female students, with little experience.
Social influence	Gender, age, experience, voluntariness of use	Greater effect from younger females
Identifiability	Gender, age, experience	Stronger effects from younger students, specifically female students, with little experience.

Older students felt comfortable enough to not require the monitoring system, thus, performance wasn't an issue for them. Younger students felt the need for it to perform accurately, and all of the time, as the presence of the system provided them with a greater sense of benefit than any alternative methods.

All students preferred if the system was effortless, but the levels of accepted effort required diminished as the age of the students grew. Females had a higher tolerance for the effort required and their perceived benefit outweighed the extra effort.

Social influence towards system use was presented through experience, age, gender, and voluntariness of use. The more experienced students, usually correlating with age, would have preferred a system like this in their earlier years, and as a result, passing this knowledge on to new students would influence their opinion of the system.

“I would have loved to have something like this when I just joined campus. Would have saved me a lot of time organising myself”

Female students felt more influenced to utilise the system as there was a general sense of it providing more safety for themselves. Lastly, the voluntariness of use was a minor factor, as if it wasn't a mandatory event, it would be manually initiated with the consent of both parties.

Identifiability had a similar result as effort expectancy. Female students felt identifiability should be a large factor in the design. Secondary to that, age had an effect on those with less experience as well as the younger students.

5. Discussion

This chapter will contain the discussion aspect of the research. The structure is defined by the research questions, with each subsection addressing a specific research question. There is a final subsection discussing the UTAUT model and the influence it has had on this research.

5.1. What aspects of identification guide the design of the system?

The need to identify the members in the interaction and have them be held accountable for anything said or done is vital. Identification should be elaborate enough to provide substantial evidence to identify the individuals in the interaction with no sense of ambiguity. Feelings toward this sense of identification were reciprocated by both students and staff as the evidence was deemed valuable in providing proof in the event of misconduct. This indicates that there is a general sense of hesitation and restraint when engaging with individuals as the involved parties wish not to say or do something that can be misconstrued. These results provide vital information for identifying key areas of the requirements for the system. Individuals felt that any information being captured must provide an adequate level of identification, thus meaning multiple layers of identification should be used. This comes in the form of audio or video recording, coupled with identifying details, and accepting that the details are in fact correct. Once accepted, in the event that the recordings are required to be reviewed, they cannot be disputed as they were accepted by all parties involved.

Utilising the modified UTAUT model, Figure 2, certain constructs have found their respective associations in the results. Regarding age and gender, the idea of identification is more prevalent in junior years of study, when students are still in the early stages of developing relationships with the staff. Younger female students regard identification as a must-have characteristic of the system. Junior students feel nervous when engaging with staff and have a higher level of hesitation towards arranging an interaction than senior students. This is due to the feeling of being in a new environment with new people whom they do not yet know well enough to feel an adequate level of safety with. They are afraid to engage with staff as they have yet to feel comfortable approaching them on a personal level in an office environment. It was not only the junior students in the discussion who felt this way, senior students agreed to having felt this way during their junior years at university.

“All through life we are taught not to talk to strangers, then we’re thrown into an environment with thousands of new people and hundreds of new staff. For those who are less sociable, this is a nightmare”

Students stated that if they were assured some level of safety when considering an engagement with staff then they'll be more likely to follow through and conduct the interaction. They associate the idea of being able to identify the users in the interaction and having it on record, with a high level of personal safety, suggesting that if security was provided in the event of a conflict, a resolution could be made with adequate evidence that ensures justice. This is important as the university's *raison d'être* is learning enhancement, therefore encouraging student-staff interactions aids in that manner. Age and gender have a direct and noticeable impact on the identifiability construct, with higher approval levels from the younger female students.

Providing an environment that is safe to engage other scholars may supplement the frequency of interactions. Staff are willing to aid students in their need for safety during an interaction through open-door policies and institutional policy awareness, where they help students become aware of policies in place. Lessening the workload for the staff, the system could provide a central location for the policies where the users will be more aware of their existence if the system design promotes accessibility.

Documentation methods also drive the need for a monitoring system. This is due to interactions being recorded with the content discussed in the interactions being readily available for use. Students indicated that they were not completely satisfied with their current method of documenting interactions and would appreciate the extra content being generated.

5.2. What functionality of the system is being necessitated by societal needs?

To survive, there are basic needs which are required (Maslow, 1943), as well as societal needs that have been defined to ensure society develops (Holtgrewe, Millard, n.d.; Organisation for Economic Co-operation and Development, n.d.). Associated with social needs are the challenges towards providing for these needs. Globally there are challenges, however, in Africa, there is a prevalence of violence (Allison, 2020) and a lack of education (United Nations Educational, Scientific and Cultural Organization, 2019). Providing for these challenges could be through multiple methods, but the focus should be placed on overcoming these challenges and providing adequate safety and education.

Societal needs are a broader area than identification as these deal with, but are not limited to, social stigmas. Two areas that have proven relevant in both literature and data gathering are that of gender-based violence and misconduct allegations towards staff. Age and gender once again play a large role

in this objective as students have stated that they have concerns in the area of staff misconduct when alone in an interaction. It should be noted that not all students felt as strongly about this concern as others did. Among the females, it was evident that there was a higher level concern for their safety as they were aware of the possibility of misconduct being higher against them. This concern is associated with gender-based violence as statistics indicate that females are more likely to be victims than males (Plan International, n.d.). What should also be noted is that the concerns displayed were varying, as students during their first year indicated a higher level of concern, however, as time at the university progressed and they proceeded through their studies into their latter years, their concerns slowly diminished due to becoming more familiar with the environment and the people in it. The staff and other students were no longer strangers to them as they had, in some manner, engaged with each other. This means that as the students grew older they felt less at risk when engaging with staff.

Societal needs and the attempt to resolve them relate closely to the theme of identification. Allowing for identification to occur is perceived as a sense of high security. When identification can occur, students feel less vulnerable and more open to interactions. Identification can help aid in lowering misconduct as behaviour changes occur when individuals are aware that they are being recorded. This behaviour change is because they are now liable for their actions through a recording that is logging all the events of the interaction. Behavioural changes can reduce the feeling of a free environment as one is self-conscious about being on record, however, if no misconduct is intended then there is no need to restrict one's actions. Being recorded acts as a deterrent for any misconduct, but it should be disclosed that it is not a system that will guarantee absolute safety, but rather aid in reducing the chances of it occurring.

These recordings would also aid individuals during the pre-interaction phase. Those individuals who go out of their way to ensure their safety by informing third parties could remove this step, although the choice is directly up to the level of security felt by the individual.

The area of consent is one to be taken into consideration as recording conversations could be considered illegal under certain circumstances. Consent relates directly to the voluntariness of use construct. Stated in the Regulation of Interception of Communications and Provision of Communication Related Information Act (RICA), recording a conversation of which you are a party to, without the consent of the other involved parties, is not illegal (Regulation of Interception of Communications and Provision of Communication Related Information Act, 2002). This implies that any individual involved in the conversation may record the conversation without explicit consent

from those involved. Consent may be appealing to the parties utilising the monitoring system, however, it is not a requirement in order to conduct the recording.

5.3. How should the autonomous nature of the system be designed to ensure an acceptable level of effort is used?

The primary feeling toward automation, which is also the ideal situation, is that there should be no human interaction with the system during its execution. This is because of the idea that humans could manipulate the information being recorded if given an opportunity. In an ideal system, this high level of automation could be possible, where a robust device designed for video recording and audio recording could be placed into the environment and provide a level of identification adequate enough to identify an individual with absolute certainty. This system would require no interaction as visual identification would be enough to verify a user. In the environment studied, and incorporating its unique context, such a system is not what is being requested, as a more portable, low resource intensive system is the preferable choice. The platform for system deployment would be fulfilled through the use of a mobile device. Utilising this device for video and audio recording would require specific placement of the device, this would also rely on the individual to initiate and conclude the recording, as well as relying on the quality of the device and the present battery life. This effect of increased battery drain eliminated the opportunity for video recording an interaction. The system would now rely solely on audio recordings, as storage and resource requirements are less demanding for this method. Because of the new requirements, the system will require human interaction to allow for users to verify that they are indeed partaking in the interaction. This verification acts as a signature as visual confirmation cannot be provided and used through the system. Along with signing off on being a participant, identifying details will also be captured, such as student/staff number, date and time, and location. Only details that cannot be automatically generated, such as student/staff numbers, will be input fields in the system.

Included in the area of automation is the aspect of documentation. Taking notes during interactions is favoured as it helps individuals retain the knowledge they have gained in the discussions. Unfortunately, there are instances when students are unable to make notes and as a result, a majority of the content of the discussions is lost as it is never documented and often forgotten.

This need for additional material is supported by the fact that students have indicated they lack the formal expertise for creating a high-level learning material document. Standards towards documentation are often self-taught and dependant entirely on the user and their experiences in prior learning institutions, such as schools. Being able to accurately document critical points during a

discussion proves difficult for some students and this leads to the documented content being below par in terms of providing substance to learning. Allowing students this additional means of reviewing the discussion for a deeper understanding of the content is positively perceived as students believe it will aid them in their studies.

Three distinct points have come to light while analysing the responses. The first is quality, the second is fluidity, and the third is effort. There is some compromise being made when documenting notes solely through paper-based methods. When trying to stay engaged in the meeting, the quality of the content is high, this leads to a deeper conversation on the content and aids in one's overall understanding. The compromise appears in the form of an inability to effectively document this content during the engagement as more effort is spent on the fluidity of engagement rather than the documentation. If more focus is placed on the quality of the notes, students lack the ability to hold an engaging conversation, therefore affecting the overall fluidity of the engagement. More effort is placed on documenting highly detailed notes instead of keeping the conversation fluid and meaningful in terms of quality. The effort expended and where to focus it is determined by the individual documenting the interaction. Providing the system to record an interaction removes the necessity of manual documentation as the content of the recording is available post-interaction for review. All students felt that the effort involved with operating the system should be as minimal as possible. It should not distract from the natural flow of the interaction and not be a burden to the users when in operation.

Students showed dislike towards constant recording at every instance of an interaction, but to provide a reliable level of safety and system integrity, the system should operate at full capacity during all interactions. Allowing for the choice of when to record an interaction can diminish the integrity of the system as it cannot provide logs of all occurrences and relies solely on the initiative of an individual. The system should also adequately provide notification if it is in an active state as there is a fear of being recorded while being unaware.

5.4. How can the security of the monitoring system be designed to ensure that confidentiality is upheld?

The security of the system should first and foremost provide user authenticated access. Enabling a user login method of access will ensure only those users with legitimate access to the system have the ability to use it. In this instance, the users will be those staff and students registered and working for the university. Usernames are already provided to each member by means of their student/staff

number, and this can be used as the username for this system. Passwords should follow conventions deemed acceptable for an adequate level of security, or follow password regulations set out by the system or institute. Such regulations often specify the use of an alphanumeric password, with uppercase and lowercase characters, and special characters.

Confidentiality should include the area of the recording files themselves. There is strong distrust towards allowing for the distribution of these files, as such all files will be restricted from being distributable, modifiable, or removable. Confidentiality of the involved parties is ensured in this manner as unauthorised distribution cannot occur. An audit trail will be used to log all streams and downloads for the recordings. Unfortunately, this desire to restrict distribution produces drawbacks in the event of offline file access. Due to the nature of filing systems on electronic devices, access to unsecured files can be attained. Individuals indicated the desire to have access to these recordings even in the event of a lack of internet access. This interest was brought about due to the regular occurrence of 'load shedding', where users do not have electricity for certain periods. Allowing for the offline access of these recordings on devices powered by batteries may allow for playback even in the event of a lack of internet due to internet equipment being unpowered. Understanding the need for confidentiality, as well as the need for offline access, a level of encryption is required to allow for secure playback and restriction of playback on unauthorised devices.

5.5. What software platform best suits the needs of the monitoring system?

Secondary research has proven to be vague in this specific situation, however, similar systems have been produced or examined for similar scenarios. Such scenarios include recording devices installed in the lecture venues of tertiary institutes. According to literature, these devices are more permanent fixtures in the venue, incorporating both audio and visual recording. These devices provide the level of detail required for clear identification as it contains visual proof to identify individuals. It does lack in the audio recording aspect if microphones are not strategically placed. Due to the size of the venue, microphones need to be placed to capture audio clearly and provide an accurate depiction of what is being said. Such placement may involve multiple microphones, depending on the size of the venue. They should also be placed in locations that are not easily accessible to individuals to prevent tampering. A location close enough to the individuals in the venue is required to provide clarity for audio recording, however, distance is required to prevent individuals from interfering with the microphone itself and affecting the recording integrity. These requirements are specific for a lecture venue which is often larger than an office environment at an institute, and as such, this information should be incorporated when designing the office monitoring system. Due to the nature of the system

not allowing for visual recording, more dependency is placed on the audio recording, and audio clarity is a priority. All this information points to an audio recording device near the individuals in the interaction. An office environment is a smaller space, with generally less traffic than that of a lecture venue, and as a result, the device can be placed closer to the participants as interference or tampering will be more noticeable by attending parties who can question the actions.

The device is required to be portable, as indicated by the sample group. The data gathered show that individuals would prefer to be able to use a system like this not only for formal interactions in office spaces but for informal interactions outside the office space. This level of portability is supported by the desire to provide playback at any time or location, and not just when situated at a large stationary device like a desktop computer. A highly portable device that can be placed near the individuals engaging in the interaction supports the use of mobile technology, such as cell phones and tablets. Laptops can be incorporated into this list of potential devices but may be ruled out due to the desire for user convenience. This convenience, supported by the framework of TAM, states that if a system is easy to use and provides usefulness, it will be used. The functionality of the system will not differ whether it is on a cell phone or a laptop, however, due to the more portable nature of handheld devices like cell phones, there is an associated level of convenience.

“I almost always have my cell phone on me whenever I go anywhere, but my laptop stays in one place usually. Like at campus, I have my laptop with me but if I where to go into a meeting I don’t always carry my laptop unless it’s necessary, but I always carry my cell phone. It works the same as my laptop and I can use it to google anything or jot down some notes”

With cell phones being used as a replacement for larger desktop systems, these devices are being used to access learning material and documented content. Contrasting studies have indicated that documentation levels using mobile devices have changed over the years. The desire to use mobile devices to access learning content has stayed the same, however, with a positive uptake indicating that students have and still are, using mobile devices to access learning content (Alfawareh & Jusoh, 2014; Madlala, Civilcharran & Singh, 2020). With the growth in internet connectivity, cloud storage availability, and technological advances in mobile devices, these factors aid in providing less resistance to adoption of technology (Vogel, Kennedy, Kuan, Kwok & Lai, 2007).

5.6. UTAUT Model

Throughout each of the above subsections, results have aligned with the constructs of the UTAUT model being used in the research. Although split, each construct has been referenced at some point, with a few being associated with multiple results. The independent moderators – that being age, gender, experience, and voluntariness of use – applied certain influences onto the four dependant constructs of Performance Expectancy, Effort Expectancy, Social Influences, and Identifiability.

Age and gender guided the system design in a manner that prioritised identification. Younger female students felt the need to accurately and unambiguously identify the parties involved with the interaction. Age also affected the social influence construct, as younger students feared ostracisation in the event of misconduct. Gender impacted social influence with female students choosing to use the system to ensure their physical safety. Male students chose to use the system to protect their mental safety. The reasoning behind these decisions stemmed from society providing a negative influence on these two areas of safety outside of the institute, as visible through the statistics for GBV.

Voluntariness of use was associated directly with the concept of consent. This moderator affected social influence as society is moving towards a more inclusive culture of asking permission to perform actions. Socially it would be questionable to record individuals without their consent, and thus the same virtues carries though into the system to ensure functionality accounted for party consent.

Experience was an overall moderator that affected the system as a whole. If students felt the system to be too cumbersome to use, they would be less inclined to consistently use the system. The only instance where extra effort would be allowed is if the performance of the system far outweighed the extra effort required. Experience was initially a limiting factor as students without knowledge in the IT sector were hesitant to pick up such a system as they were afraid of what could happen with the recordings and their personal data. It was later established that with a little more knowledge on how the system worked, adoption of the system was positively affected. Experience was a large factor in affecting the construct of

performance expectancy even though the research model made no such relation. Less experienced individuals highlighted wanting to have a system that performed autonomously as their lack of experience could have impacted the proper execution of the system.

The diagram below depicts the findings and how each moderator affected the constructs. The line thickness leading out of a moderator indicates the level of influence it has on the construct line it points to.

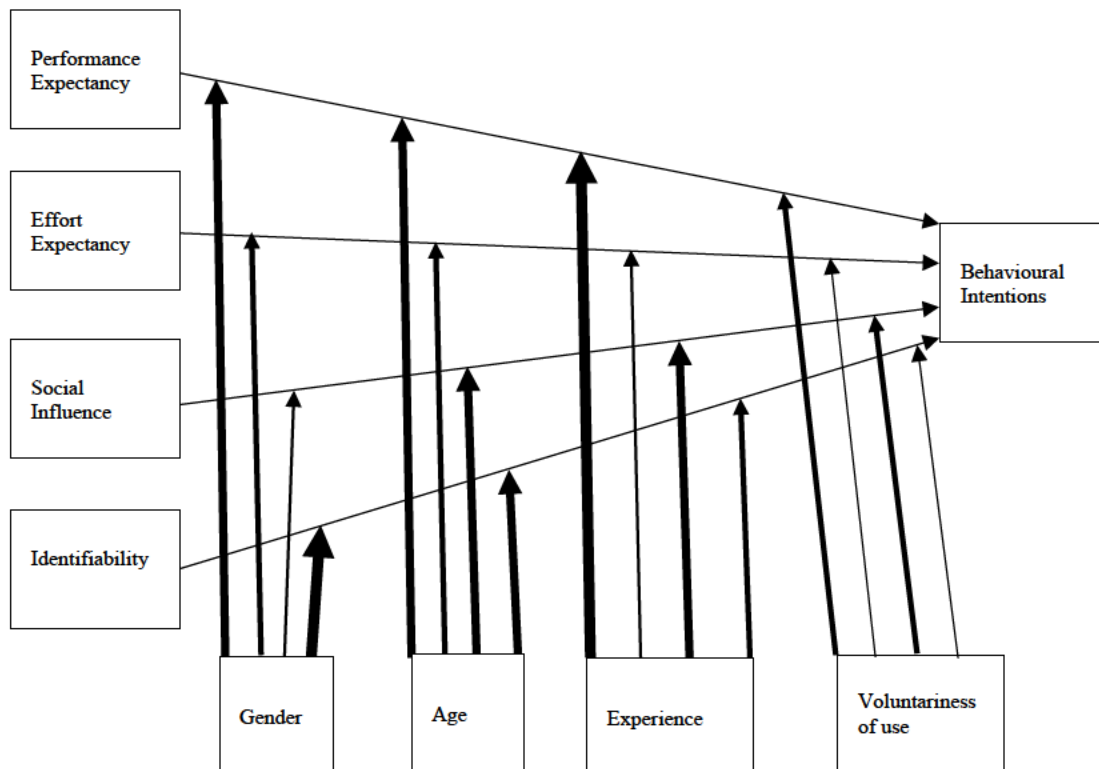


Figure 14: A UTAUT model depicting moderator influences based on findings

6. Conclusion

6.1. Introduction

Having concluded the qualitative exploratory research, the data analysis indicates that individuals feel the need for a monitoring system during interactions in formal university environments. Students from different backgrounds shared their experiences and opinions on interactions between staff and students. Experiences were also provided by a member of staff from the institution. This data was analysed to produce requirements and guidelines towards the creation of a tangible artefact, that being a monitoring system in the form of a recording device.

6.2. Dissertation conclusion

Certain functionality has been determined as essential for the system design. In the event of development, the research showed the system should include the following functions:

- User authentication through the use of a login feature.
- Audio recording of the interaction upon activation by a user.
- A semi-autonomous nature to prevent any unnecessary points of failure.
- Secure storage to allow for the integrity of the recordings to be unquestioned.
- Portability to allow for access to the system from any location deemed necessary.

The design of the system has been determined by the requirements presented by the sample. The primary objective of the system is to help identify all involved parties without ambiguity. In the desired context of the office environments at the University of KwaZulu-Natal, it has been determined that individuals place importance on the area of identification, and because of the nature of the platform restrictions, identification can only occur through specific detail capturing and relies solely on audio recordings. Individuals associate the idea of identifying the parties involved in the interaction with a sense of safety during said interaction. As a result of this, the level of identification attained plays an important role in the level of perceived safety. This means that the design of the system should place high importance on the identification of all parties involved during any interaction.

The platform should be a portable device capable of internet access with the functionality to provide audio capture and playback. It should also be available to all individuals and have a level of security

to ensure the protection of the recorded data. Incorporating these requirements, the device that fits the criteria most accurately is cell phones. These devices are more accessible than that of their larger counterparts like laptops or tablets, but also entail the functionality that is required in the way of audio capture and playback, and internet access.

The construct of societal needs is closely tied to identification, as it is a primary driving factor for high levels of identification. Broader areas also supporting the need for identification are those related to illegal actions. Gender-based violence and misconduct on university premises have been widely reported, with efforts to combat such activities showing promise – but not a cure.

Autonomy in a system is decided by multiple factors. Tying in the need for confidentiality and integrity, the level of autonomy should be high enough to dispel any argument of foul play. The system should provide adequate information while restricting the ability of the user to alter key details. Consent by all parties should be provided at some stage before system use, however, mandatory recording - if decided upon - would be a discussion at the policymaker level of the institute.

Confidentiality is a requirement when dealing with any system holding an individual's personal information. Policies and regulations about the individual's access to the stored data are discussed in depth globally and laws define the actions available to the individual. The distribution of the said details as well as the stored recordings should be regulated through the use of policies to which the users have access and are made aware of. This is ensured with consent being provided before using the system.

6.3. Limitation and Future Work

Certain limitations have been uncovered during the process of this research. The ability to generalise the results has limitations in the way of not considering the sample group from a large enough population. The population of this research was limited to a specific campus of a university, thus reducing the total viable participants. This restriction also affected the available schools of study to be included in the research.

The systematic sampling process was repeated using the same sample group. Saturation was reached, however, saturation across multiple sample groups would provide more generalised results.

This research can be enhanced by including a larger population, while also using multiple sample groups through the refinement process.

6.4. Conclusion

A system designed to monitor the interactions between individuals inside of a formal university environment, that being offices, is viewed favourably by the intended participants. The system would provide a primary benefit of deterring individuals from conducting forms of misconduct, with a secondary benefit of allowing a recording of the interaction to be used during the learning process. The system should include features that provide adequate forms of identifiability, as well as event logging to capture what transpires during the said interaction. The device used to implement the system should be portable so as to allow for the use of the system in any location deemed necessary. The information captured through the system must be securely stored in a central location, accessible only by authorised parties, while being incorruptible and unmodifiable.

7. Appendix

7.1. Appendix A – Focus Group Procedure

My name is Ruchit Mahabir and I am a Masters student at the University of KwaZulu-Natal. My research is in the field of Information Systems and is titled: “Analysis of pre-implementation requirements for the design of a monitoring system for staff student interactions in a university environment.”. This research aims to determine the functionality required for a system that would act in a monitoring state during student and staff interactions.

The structure of this discussion will consist of a preliminary set of simple questions to allow everyone to feel free to talk, followed by more in-depth questions, thereafter, I will provide you all with some documents to outline the proposed system I have created based on prior research. A final set of questions will be asked after all individuals have understood the proposed system. the aim of this discussion is to provide your insight on the topic being discussed by relaying the experiences you have personally had. These questions are designed to be non-intrusive and will in no way put you in harm’s way, nor will it be distributed or used in any manner other than that of this research project.

Your experiences, feelings and perceptions are all welcome as this system will need to have the requirements deemed necessary by the users, which will be all of you. All information is useful including the manner in which you speak, as a result, don’t feel afraid to speak if you have concerns or questions. Lastly, this is a discussion, I will guide the discussion however I wish that you all talk, not just to me, but to each other, and question each other and their points.

The following questions serve as a guide for the focus group discussion.

Safety

- Are you ever worried about your safety when going into an interaction with a staff/student?
 - Describe the environment that makes you feel the way you do?

- If you do feel at risk, what steps do you do to make the environment safer?
- Does this include going out of your way to inform a friend or third party that you are engaging in a meeting with someone?
- Think back to your first year, could you describe your thoughts towards interacting with a member of staff?
 - Were there any thoughts that made you hesitant towards approaching a staff member?
 - How has that changed over the period of your studies?
- What is your own understanding of conflict in an office environment?
 - Have you ever been made aware of or used the policies towards resolving conflict at UKZN?

Documentation

- How does writing notes affect your ability to focus and/or keep the interaction fluid?
- How would you describe your level of detail in the notes you write down?
 - What methods would you take to improve your note taking abilities?
- What details/information would you make a note of if you were to make a formal document for the interaction between two or more parties?
 - How experienced are you in taking notes?
 - Have you taken any courses?
- What methods do you implement to organise your notes?
- Are you always looking for more learning resources outside of the lecture environment?
 - Where do you search for these resources?

General

- What are your feelings towards being recorded in an interaction?
- Think back to any moment you were being recorded – did it make you act differently?
 - How did it affect your behaviour and mentality?
- What do you know of digital security and how to secure confidential files?
- What are your thoughts on the security of online cloud storage?

- Are you aware of the recent breaches with online storage? For example, the iCloud breach, the Garmin breach, the PlayStation network breach?
- Amongst the most common form of technology (mobile devices, laptops, and desktop computers), could you name some of your own pros and cons of use from experience.
 - Have you had instances where you were unable to access the UKZN network during an important period? For example, exam time or days before an assignment is due?
- What form of technology do you think is most accessible to the student of UKZN? For example, mobile devices or laptops or desktop computers?

Potential System explained:

The system in question relates to any office environment on UKZN grounds. The idea is to provide a system that records interactions and then stores it on a neutral third-party server. The recording is available to any parties involved in the interaction for download by way of secure access to the stored item, but these recordings cannot be edited or deleted in any way. Uses of the recordings are two-fold: it could serve as learning materials to students, and it could be used as proof/evidence if any misconduct allegations were made on anyone in the interaction (cases of students claiming sexual misconduct for example). An ideal system would allow no party involved to interact with the system and recording of interactions would commence automatically. The system could use some sort of recognition to identify the individual(s). Facial recognition or RFID readers to scan active RFID student cards as someone walks in, or even a video recording instead of just audio recording. In the more contextual situation, we realise that this may not be the most feasible or even the most convenient, that is why we will discuss it now.

To summarize, the system will record office interactions between individuals. It will identify said individuals and allow access to the stored recording for the individual to access without editing. The aim is to provide a safer environment for individuals to interact.

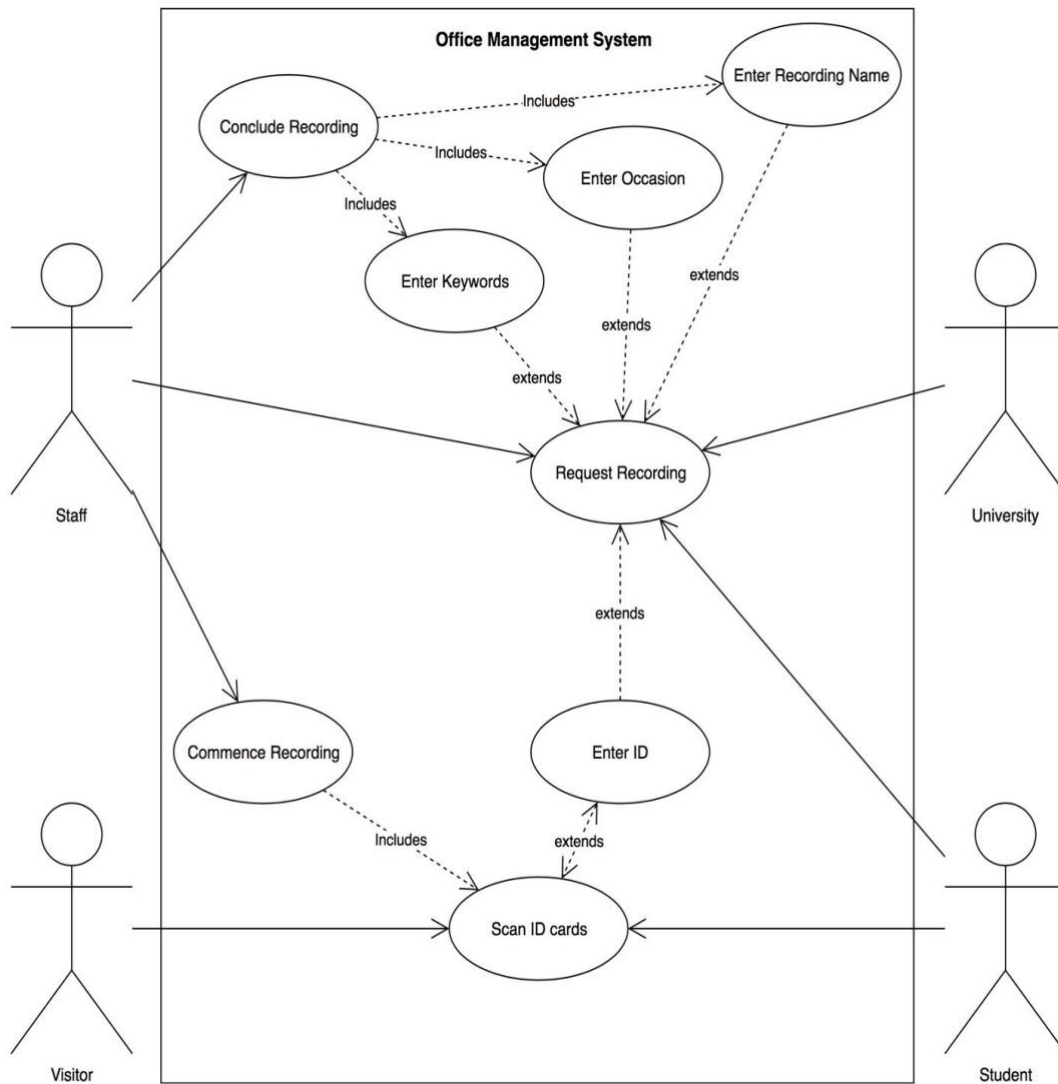
Necessity

- How necessary is a system like this in your opinion?
 - Why do you think it is necessary/not necessary?

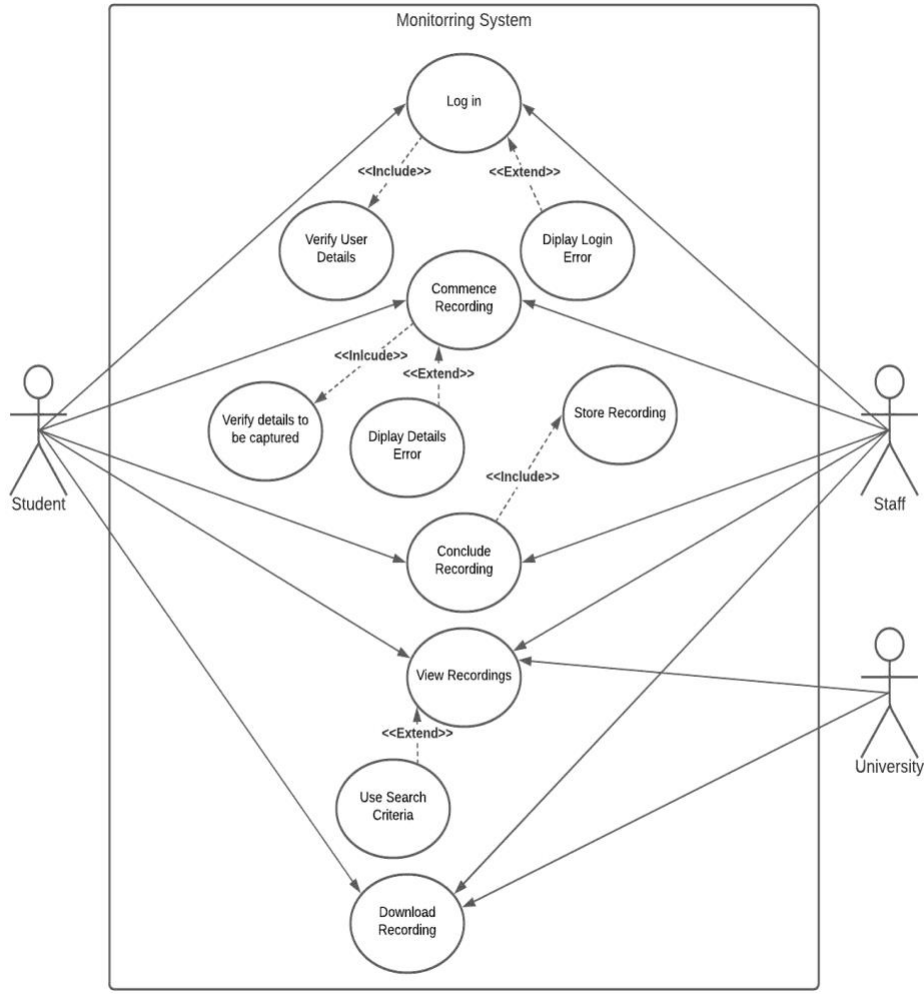
- What sort of interaction with the system would you deem as acceptable/necessary?
- What social influences could affect the use of the proposed system?
 - Are social stigmas or stereotypes involved?
- What functionality would you think is necessary in the proposed system? Besides the recording and downloading functionality, is there anything else you would like to see incorporated?

7.2. Appendix B – Theoretical system models

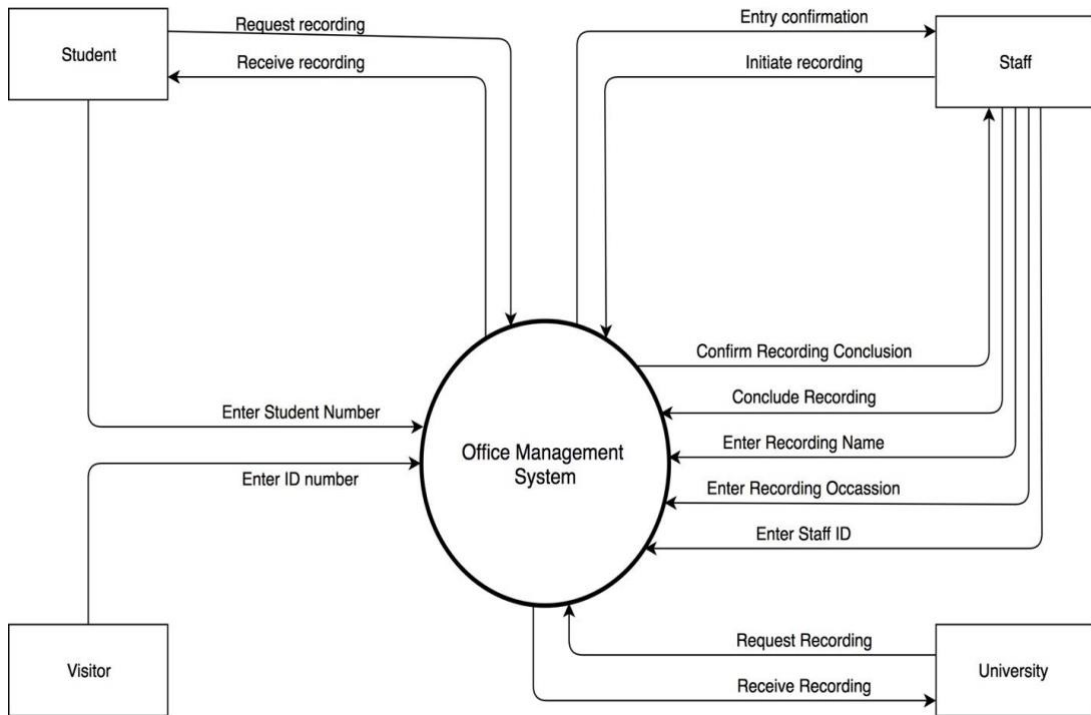
Use Case Diagram – Pre Focus Group Discussion



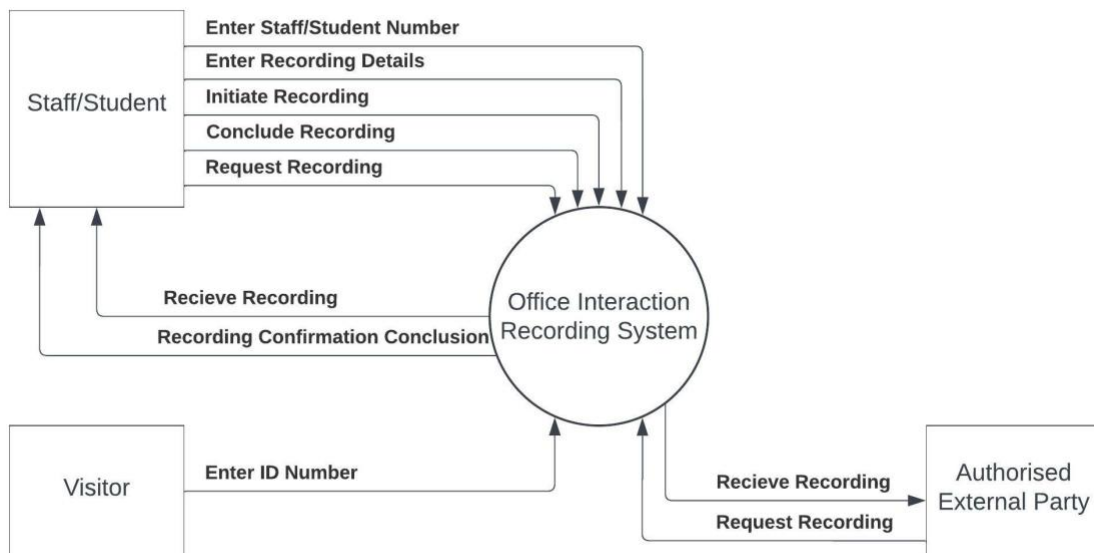
Use Case Diagram – Post Focus Group Discussion



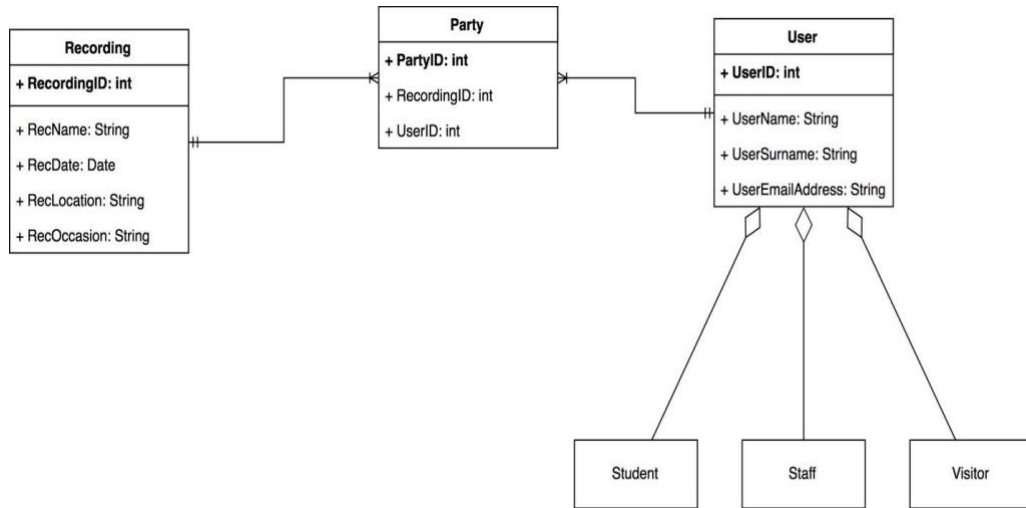
System Context Diagram – Pre Focus Group Discussion



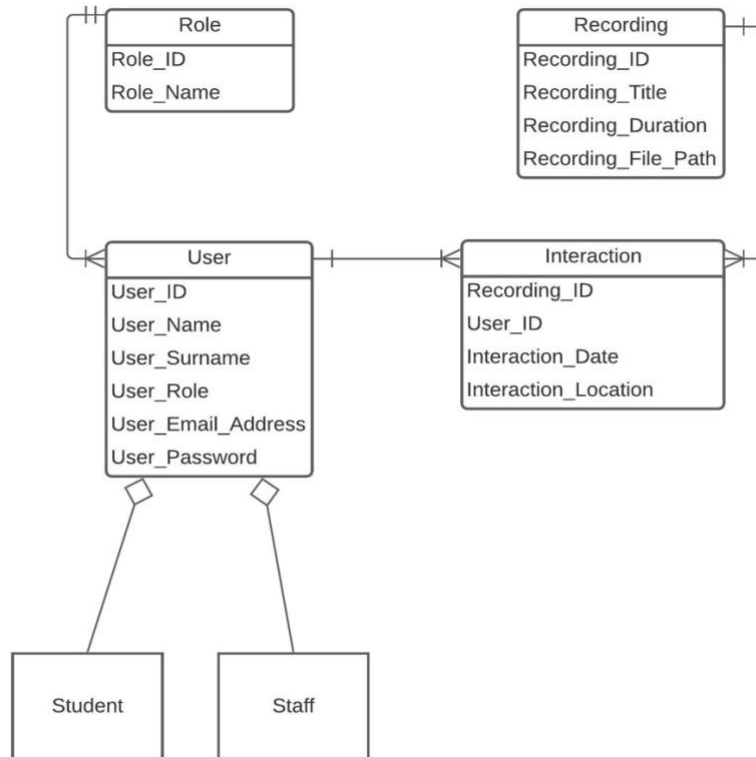
System Context Diagram – Post Focus Group Discussion



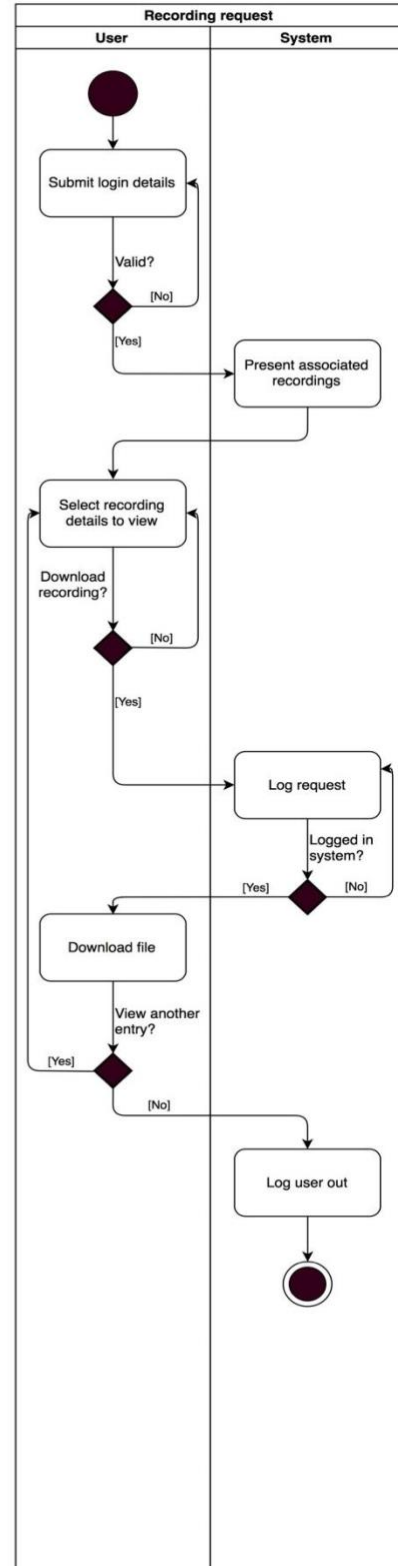
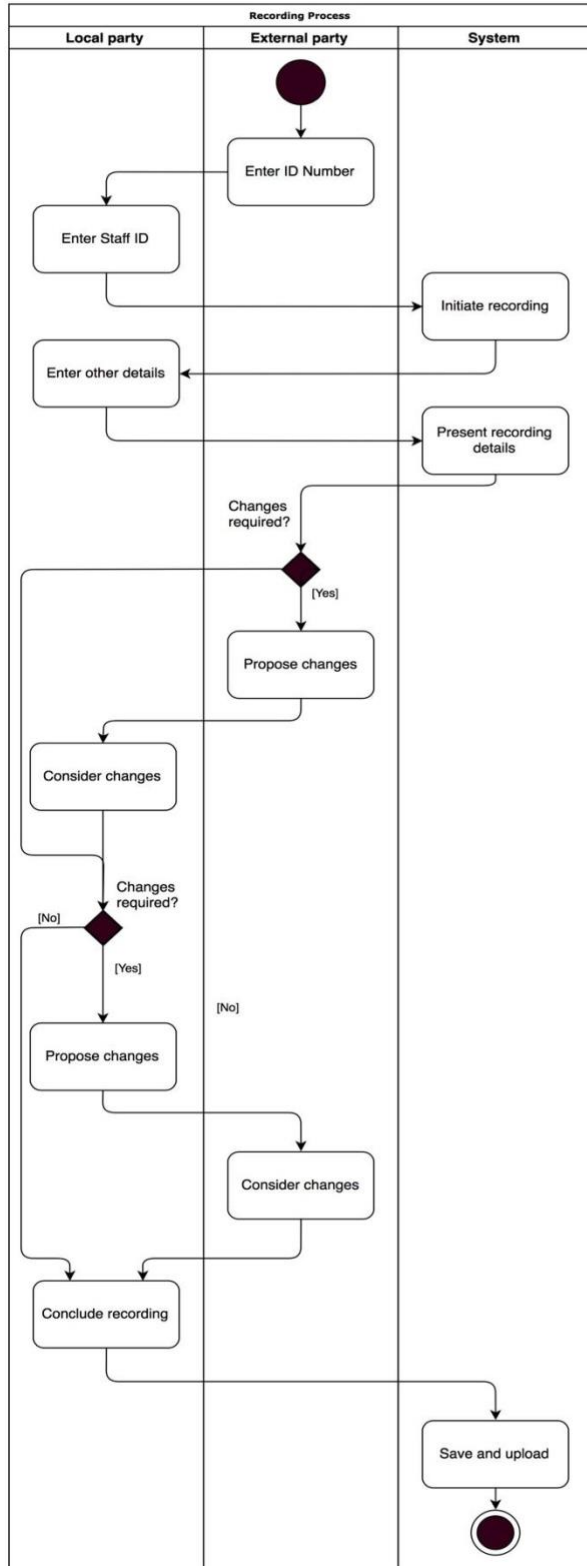
Entity Relationship Diagram – Pre Focus Group Discussion



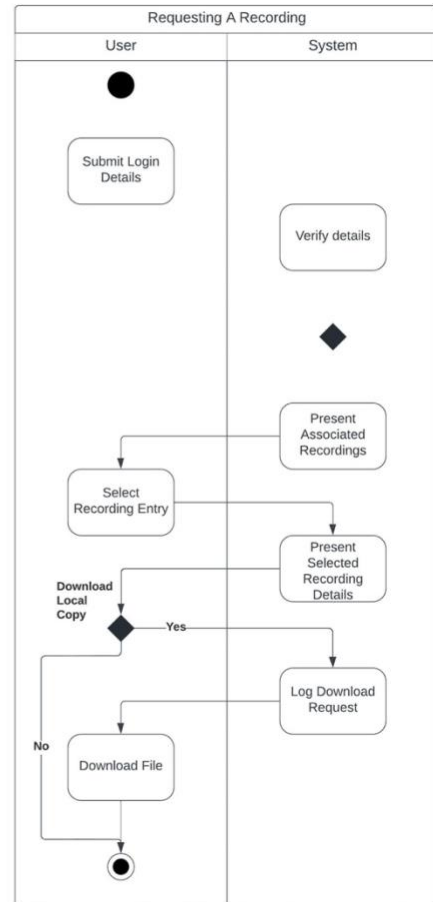
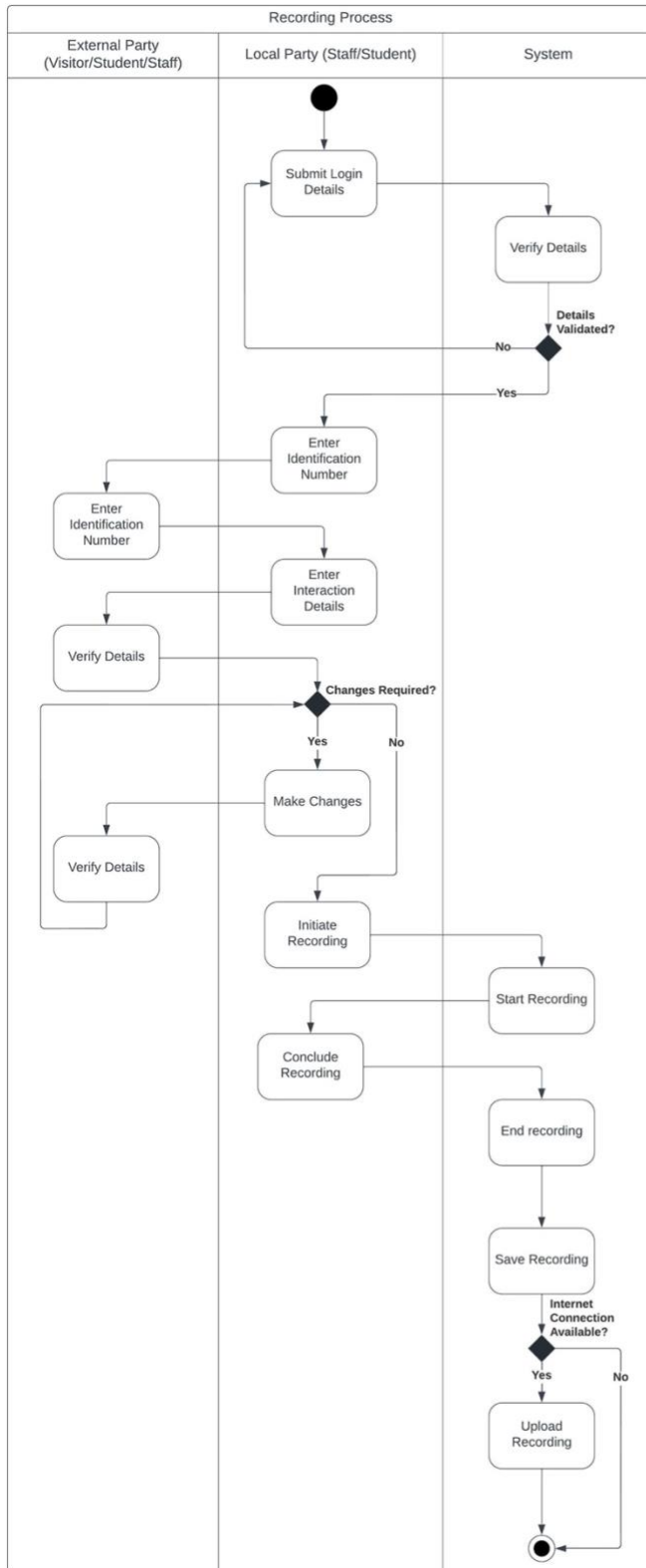
Entity Relationship Diagram – Post Focus Group Discussion



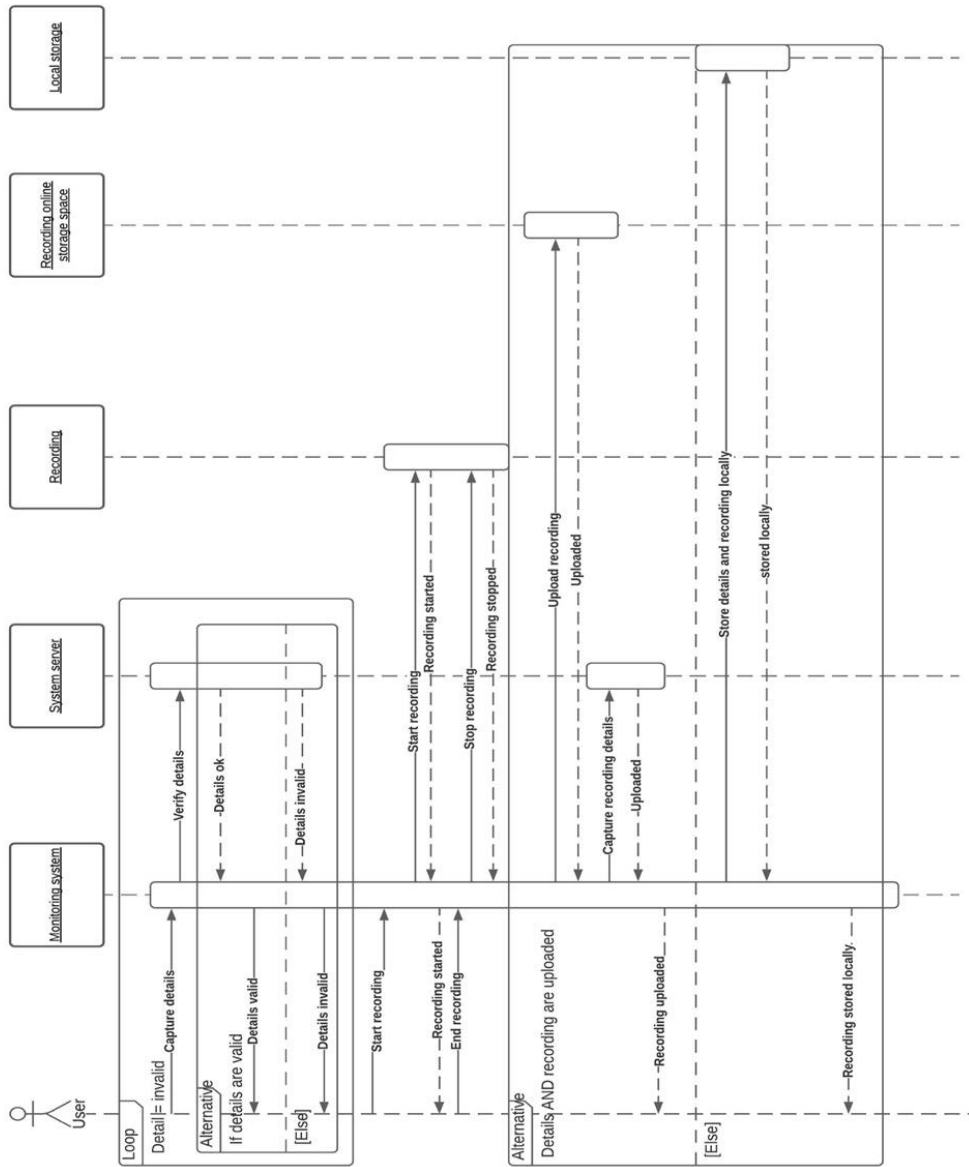
Activity Diagrams – Pre Focus group Discussion



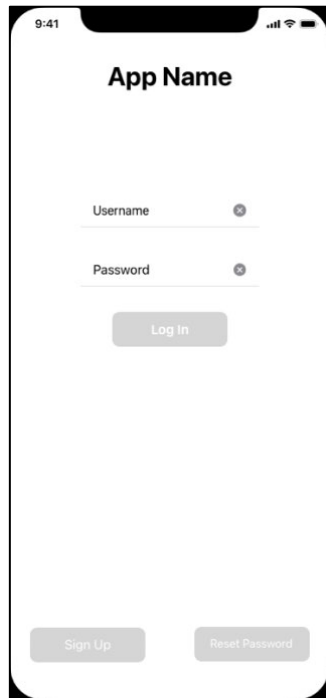
Activity Diagrams – Post Focus Group Discussion



Sequence Diagram

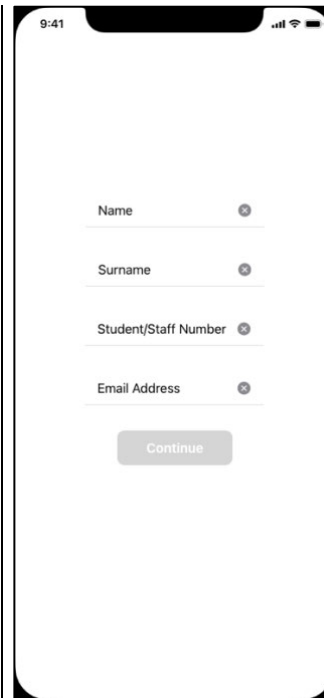


7.3. Appendix C – Wireframe Designs



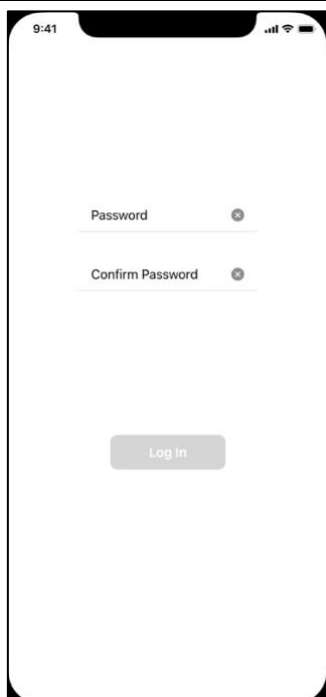
Log in

Log in screen where registered users provide their access details.



Register

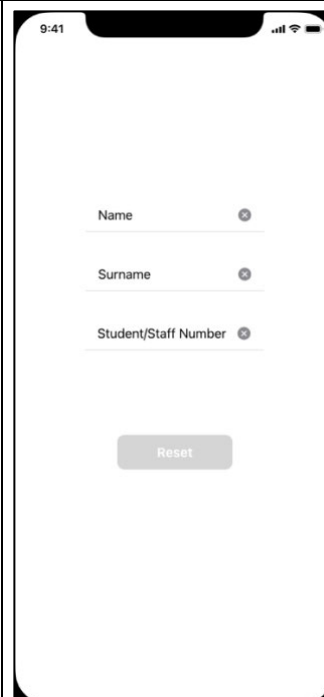
New users can register for the app by providing details



Set Password

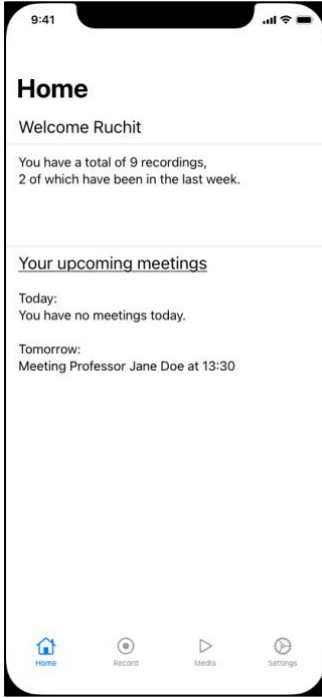
New users can set their password.

Registered users will reset their password.



Reset Password

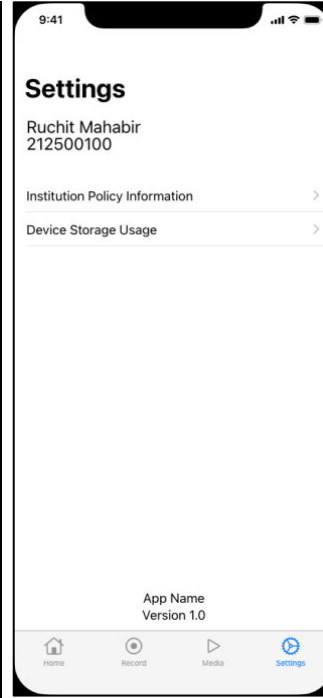
Registered users provide their details. If these details correspond to that stored in the system, they will be directed to the 'Set Password' screen.



Dashboard

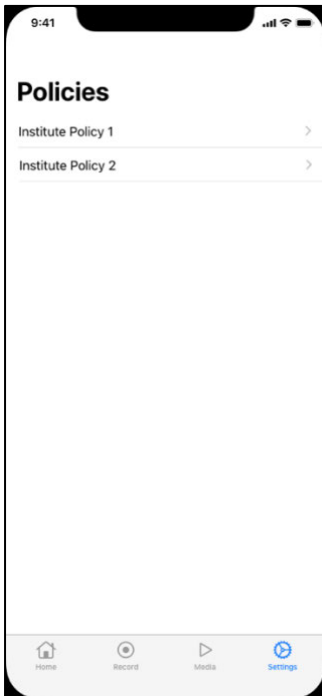
Once logged in users will be presented with a dashboard screen providing details at a glance.

Utilising the tabs at the screen users can navigate the app.



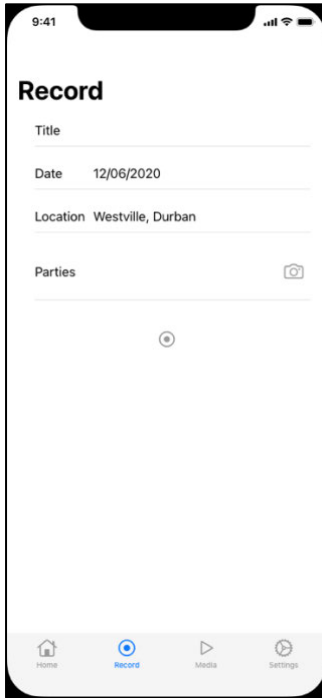
Settings

The settings screen can be used to view details of the app. Policy information about the institute is also available through the settings.



Policies

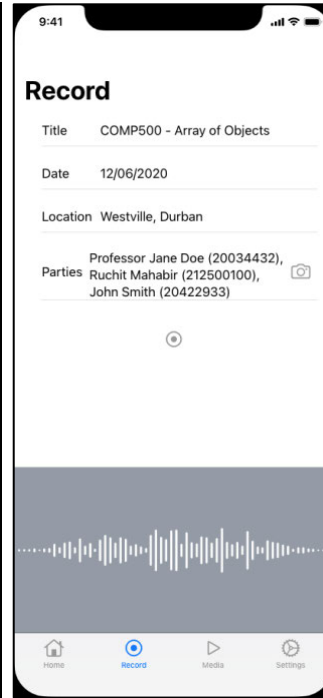
Users can view policies by selecting the policy.



Recording Setup

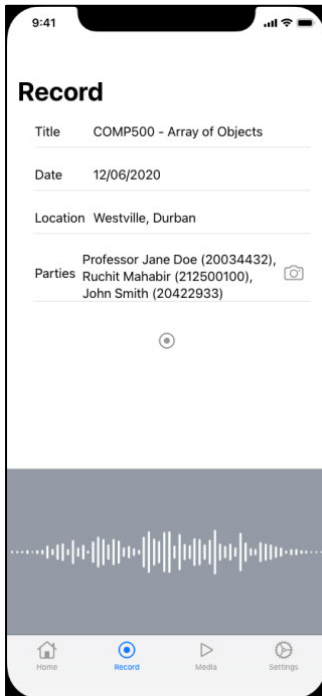
The recording screen. Certain details will be auto populated. Other details can be entered.

Student/staff card barcodes can be scanned to populate the 'parties' field accurately.



Recording

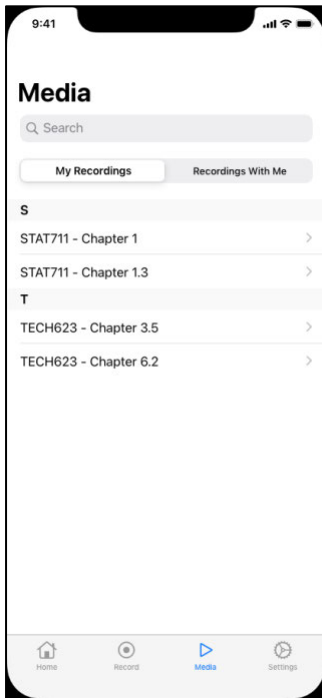
Once the details have been entered, users will activate the recording. If the details are verified the recording will start and visual confirmation will be provided.



Recording

Once entered users will activate the recording. If the details are verified the recording will start and visual confirmation will be provided.

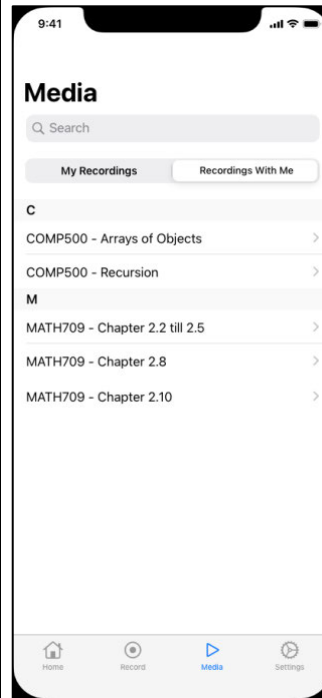
Recording Viewing



Prior recordings can be viewed.

Recordings are separated according to recordings initiated by the user and recordings the user partook in.

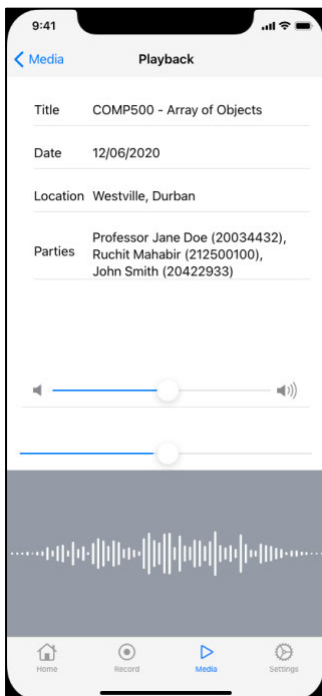
Recording Viewing



Recordings the user partook in are visible by selecting the option.

A search function is available to search all recordings according to the search criteria

Playback



Users can play the recording.

No alteration or distribution is allowed.

7.4. Appendix D - Ethical Clearance



27 October 2020

Mr Ruchit Mahabir (212516842)
School Of Man Info Tech & Gov
Westville Campus

Dear Mr Mahabir,

Protocol reference number: HSSREC/00001726/2020
Project title : The design of a monitoring system for staff-student interactions in formal university environments
Degree: Masters

Approval Notification – Full Committee Reviewed Protocol

This letter serves to notify you that your response received on 28 September 2020 to our letter of 15 September 2020 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

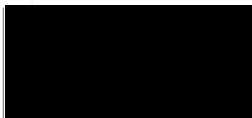
This approval is valid for one year until 27 October 2021

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours faithfully



.....
Professor Dipane Hlalele (Chair)

/dd

Humanities & Social Sciences Research Ethics Committee
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Tel: +27 31 260 8350 / 4557 / 3587
Website: <http://research.ukzn.ac.za/Research-Ethics/>

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

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