CRANFIELD UNIVERSITY

MUDHAFAR RASHED SAEED AL WAREA ALEFARI

Employee performance modelling using system dynamics

SCHOOL OF AEROSPACE, TRANSPORT AND
MANUFACTURING

PHD
Academic Year: 2016 - 2019

Supervisor: Professor Konstantinos Salonitis
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ABSTRACT

Employee performance is something dynamic, but can have great impact on the overall performance of any company. This is understood by companies and human resource management departments are responsible for measuring the performance of the employees, and come up with ideas on how to improve this constantly. Such practices include training of employees, providing initiatives such as bonuses and day offs. Furthermore, the literature review has highlighted that leadership style can have a great impact as well.

Looking in the literature of employee performance, it was clear as well that there has not been a model that can be used for predicting the impact of such initiatives from systems point of view. So the initial aim was to develop such a model that can help manufacturing companies better handle the dynamic nature of employee performance and if possible help with the decision making when deciding which initiatives to be introduced.

The literature review was focused in identifying the factors that have an impact on the employee performance and their possible interrelations. Then the best modelling approach was investigated. Modelling techniques such as discrete event simulation, agent based modelling and system dynamics were considered, with the latter selected at the end as the focus is on the impact of the change of policies and not the individual employees who cannot be modelled due to the random way of their behaviour. System dynamics models were developed based on this analysis and collecting data protocols were formulated for collecting information from companies. The models were validated in two companies in UAE. They can predict the impact that specific changes in policies will have in the employee performance and can guide the companies about what changes they should introduce.

Keywords:

Employee performance; Modelling; Manufacturing

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LIST OF PUBLICATIONS

Journal publications

[1]. <u>Alefari M.</u>, Salonitis K. (2020) "Improving employee performance through modelling" submitted for publication

[2]. <u>Alefari M.</u>, Almanei M., Salonitis K. (2020) "A system dynamics model of employees' performance" accepted for publication at *Sustainability*

[3]. <u>Alefari M.</u>, Almanei M., Salonitis K. (2020) "Lean manufacturing, leadership and employees: the case of UAE manufacturing sector" *Production and Manufacturing Research* Vol. 8, Issue 1, pp. 222-243

Conference Publications

[4]. <u>Alefari M.</u>, Salonitis K. (2018) "Assessing the employees' performance and the role of leadership" Proceedings of the 16th International Conference on Manufacturing Research ICMR 2018

[5]. <u>Alefari M.</u>, Barahona A.M.F., Salonitis K. (2018) "Modelling manufacturing employees' performance based on a system dynamics approach", Procedia CIRP, Vol. 72, pp. 438-443, DOI: 10.1016/j.procir.2018.03.161 (Proceedings of the 51st CIRP Conference on Manufacturing Systems)

[6]. <u>Alefari M.</u>, Salonitis K., Xu Y. (2017) "The role of leadership in implementing lean manufacturing" Procedia CIRP, Vol. 63, pp. 756-761. DOI: 10.1016/j.procir.2017.03.169 (Proceedings of the 50th CIRP Conference on Manufacturing Systems)

TABLE OF CONTENTS

LIST OF FIGURES

viii

LIST OF TABLES

LIST OF EQUATIONS

LIST OF ABBREVIATIONS

AS	Agent Based simulation
CA	Cronbach's Alpha
CLS	Causal loop diagram
DES	Discrete Event Simulation
EWB	Employee well-being
GCC	Gulf Cooperation Council
GDP	Gross domestic product
HR	Human Resource
HRM	Human Resource Management
IT	Information Technology
KPI	Key performance indicator
PCA	Principal Components Analysis
RO	Research objective
SD	System dynamics
SFD	Stock and flow diagram
UAE	United Arabic Emirates

1 INTRODUCTION

1.1 Background and motivation

Employee performance lies within the merit of Human Resource management (HRM). HRM refers to the policies, practices and systems that have an impact on employees' behaviour and performance (Noe et al., 2012). A number of textbooks have been written on the subject, identifying the key practices of strategic HRM, such as the analysis and design of work, the planning of human resources (HR) with regards the needs of the organization, the recruiting process for the selection of the best employees, the employees' development and training, the management of performance (evaluation and rewarding) and the development of a positive working environment.

There are evidences indicating that HR practices in the Middle East countries suffer certain deficiencies. However, these evidences are based on anecdotes and personal observations, and the present research will investigate the extend of these deficiencies. Companies face challenges nowadays that impede reinventing their HR practices related with employee performance. Also, companies in this part of the world lack the ways and techniques of evaluating and managing the employee performance. The ways companies manage their employee performance are so traditional to the degree that it makes these companies lagging behind the ones in the developed countries. Therefore, workplace organizations in the Middle East countries find no way to cope with modern trends in HR management related with the employee performance except to the embrace new approaches in a continually shifting business world and talent market.

There are four main challenges that organizations in the Middle East countries face in their endeavours to adopt lean thinking in managing HR employee performance namely; learning and development, reinventing HR practices, leadership and culture and engagement. Hence, companies in the Middle East lack the readiness to address these challenges. In addition to the previous deficiencies, Middle Eastern countries organizations lack the sound measures of

quality that help accurate measurement of the employee performance. Organizations in the United Arab Emirates do their best to address the beforehand mentioned challenges yet further steps are needed to cope with the latest trends adopted worldwide.

As one of the developing countries, the United Arabic Emirates (UAE) exerts much effort in each field to be one of the developed countries around the world. Several steps have been taken to develop the work in various sectors within the emirates under the portico of the central union government, a spirit of harmony prevails the work system in terms of laws organizing the work environment. However, certain fluctuations in measuring HR employee performance.

According to Iles et al., (2012), the Arab countries in the Middle East represent an area of increasing economic significance, also city-states such as Dubai and Abu Dhabi, media companies, and airlines such as Emirates have become key international players in a globally competitive market. In addition, these leading companies do their best to meld the appropriate elements of the contemporary HR practices in relation with employee performance as practiced in leading-edge Western organizations to a management matrix that conforms to local customs and expectations.

Dubai - for example - has evolved from a trading enclave to become the leading Middle East business/leisure centre, aiming to become a hybrid East/West economic, social and religious model that may act as a catalyst for change, Bahrain also has a national aspiration to be the financial capital and "Switzerland of the Middle East," utilizing good educational and health care systems, world-class transportation and telecommunication infrastructures, and a qualified and highly competitive labor force. These aspirations will not come true without paying a due care to smart management of the labor forces though adopting the most effective approaches to HRM worldwide (Iles et al., 2012).

Today's organizations have got no alternative to be a winning player except to adopt the modern management techniques and approaches as the real problem for the Middle East countries is not the scarcity of resources rather it is a problem of management. Prahalad (1983) and Pfeffer (1994) argue that an organization's

talent can be a source for a sustained competitive advantage; such talent can affect important organizational outcomes such as survival, profitability, customer satisfaction level, and employee performance.

The work environment prevailing organizations and institutions in the developing countries lack the sound criteria for developing HR practices related with employee performance for better organizational performance. The lack of reliable and trustworthy tool for managing HR employee performance represents an excuse for the poor practices in such part of the world. Gulf Cooperation Council (GCC) countries has achieved certain progress in the field of employee performance such as learning, training, and professional development, yet there are more steps to stand on an equal footing with the organizations in the developed countries.

The manufacturing sector in the UAE face the same challenges as all the other business sectors. In the UAE in 2015 the manufacturing sector contributed 14% to the overall GDP (Rahman, 2015). The policy that have been deployed aims that by 2021, the manufacturing sector contribution will be increased to 20% and in 2025 this should be 25%. The manufacturing sector is composed of SMEs (94% of the companies) Tsetsonis (2014). Approximately 5,200 industrial units employed almost 400,000 workers in the UAE (Wright, 2016). The challenge for manufacturing enterprises though is that employees have diverse backgrounds and nationalities. Human capital is considered as one of the major drivers for achieving the increase in the contribution to Gross Domestic Product (GDP) set in the beginning of this paragraph. The motivation for the present research is focused on human capital and especially the ways to improve employee performance.

One of the key trends in manufacturing enterprises all around the globe is the introduction of lean management in all types of operations, and not only on the production floor. Lean management principles in the field of HR practices in relation with employee performance helps coining a group of integrated components; people and processes components on the one hand and internal component related to the firm and external component related to the customers

3

(Alireza et al., 2011). Customer satisfaction is the ultimate goal of all organizations, thus, removing waste in time and effort help adding value to such organizations.

1.2 Aim and objectives

The **aim** of the present study is:

> To develop an improvement model based on system dynamics for enhancing employee performance in the UAE small and medium manufacturing enterprises.

To achieve this aim, the following research objectives (ROs) were set for the research:

RO 1: To analyse the current global trends in employee performance assessment and employee performance improvement through a thorough literature review focusing on how lean principles can improve these

RO2: To assess the current practices with regards employee performance in the UAE based manufacturing companies focusing in identifying (i) the methods used for employee performance assessment, (ii) the factors that affect employee performance, (iii) the ways adopted for improving employee performance and their efficiency

RO3: To develop a model based on system dynamics for the continuous improvement of the employee performance in the manufacturing companies.

RO4: To validate the model through a number of case studies.

1.3 Novelty of the framework and contributions to knowledge

The extensive literature review that will be presented in chapter 3 revealed that no model and/or framework has been presented for the introduction of continuous improvement on the employee performance. Furthermore, no model has been developed or adjusted to the needs of middle east manufacturing SMEs.

The research will lead to a tool that can be used from companies in order to assess ways to improve employee performance. The model will be composed of: (i) an auditing method (what to measure and how to measure the impact of different stakeholders and activities related to employee performance), (ii) a simulation model based on System Dynamics to assess the impact of proposed changes and finally.

1.4 Thesis structure and organization

The thesis is composed of seven chapters (Figure 1-1). In the following section a brief introduction of all the structures is presented. Table 1.1 presents an overview of the chapters in this thesis along with their contents.

Table 1-1 Thesis organization

Chapter 1	Introduction	• Research background and motivation • Research aim and objectives
Chapter 2	Research Methodology	• Research description • Research philosophy • Research methods used • Data analysis approach • Research approach
Chapter 3	Literature review	• Literature Review strategy • Motivation theories • Leadership models • Employee performance

		• Research trends • Research gaps
Chapter 4	Employee performance management in UAE manufacturing sector	• Industrial field study description • Interview results • Discussion of field study results
Chapter 5	System dynamics modelling of employee performance	• System dynamics basic background theory • Causal loop diagrams • Stock and flow diagrams and model • Verification of model
Chapter 6	Case studies	• Data collection protocol • Case A • Case B
Chapter 7	Discussion and conclusions	• Research contribution • Research limitation • Future
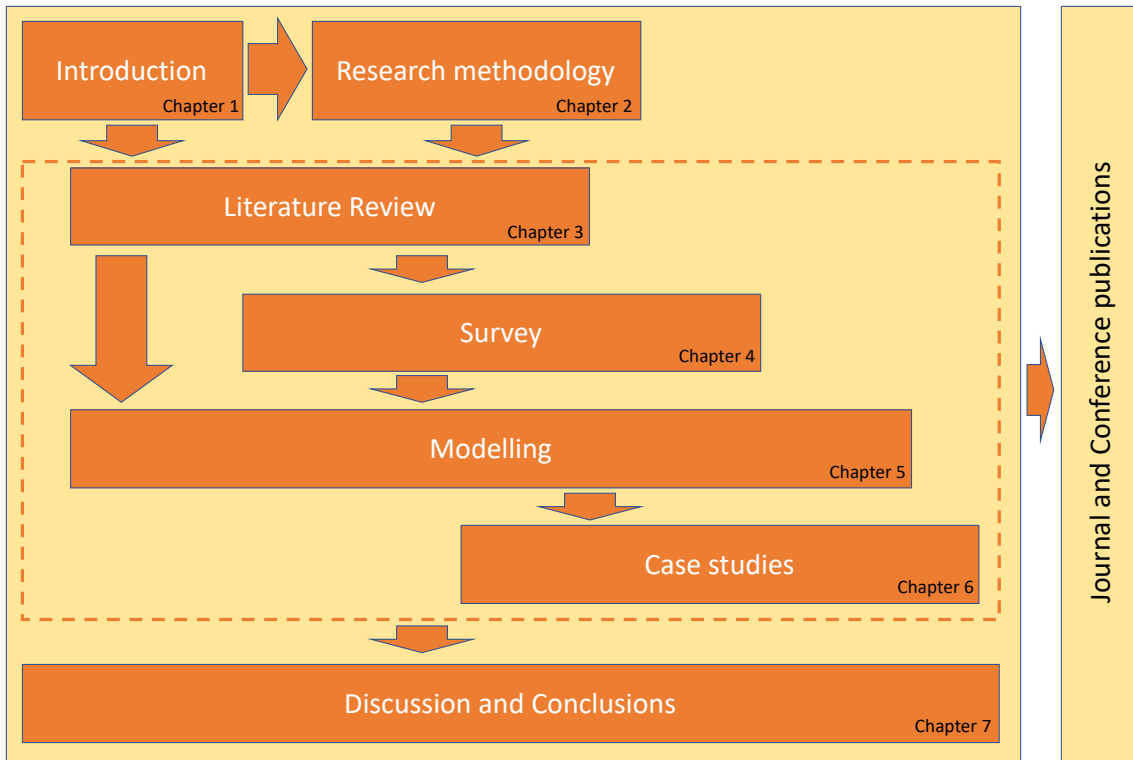
Figure 1-1 Thesis Structure

2 RESEARCH METHODOLOGY

2.1 Introduction

This chapter is presenting the research methodology employed for the present study (Figure 2-1). The chapter is divided in five subchapters. Subchapter 2.1 presents the introduction to the chapter. The second section (subchapter 2.2) highlights the philosophical stance of the researcher with regards the aim and objectives of the present study. It discusses the research ontology, epistemology of the present research. The various research methods are also compared for selecting the most appropriate one for the present study. Section (subchapter 2.3) discusses the research structure that the researcher adopted for addressing the research objectives set in the first chapter.
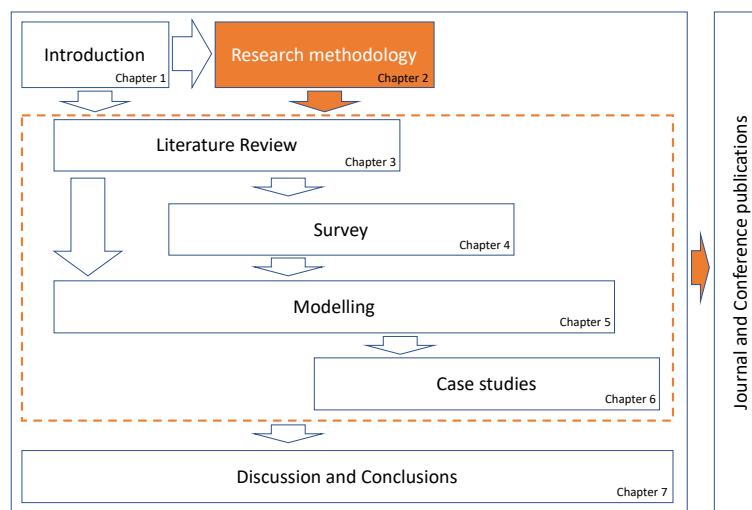
Figure 2-1 Chapter 2 within the whole thesis

2.2 Research methodology

Research methodology provides a theoretical framework to systematically conduct research towards achieving research objectives (Saunders, Lewis, & Thornbill, 2000). The selection of the research methodology depends on different factors (Walter, 2006), (Mackenzie & Knipe, 2006), constituting a key aspect towards the success of the conducted research. There is a plethora of different methods for addressing the research design, being sometimes even confusing to select the best suited one. In such a context, it is crucial to deeply understand the

research problem as well as the main aims of the conducted research in order to be able to select the most suitable research methodology to address it.

2.2.1 Research onion

Sunders, Lewis and Thornhill (2012) presented the various elements of the research philosophy in a systematic way. They have established a framework, named the "research onion" that allows the examination of the research methodology in a more systematic way (Figure 2-2). It is structured in six layers, including research philosophy, approach, strategy, methods, time horizons, and techniques and procedures. Within this framework, the onion layers are peeled off, from the outer (more general) to the inner (more specific) ones, towards the core of the onion, i.e, the core of the research. In this way, the onion framework allows the researcher to address the decision-making involved in each stage (layer), in terms of defining the philosophy, approach, strategy, methods, time horizon and procedures, in the suggested sequential order to achieve a complete insight into the studied issue. In the following paragraphs, each layer and the alternative options will be presented in more detail as to help clarify the researcher's methological decisions.
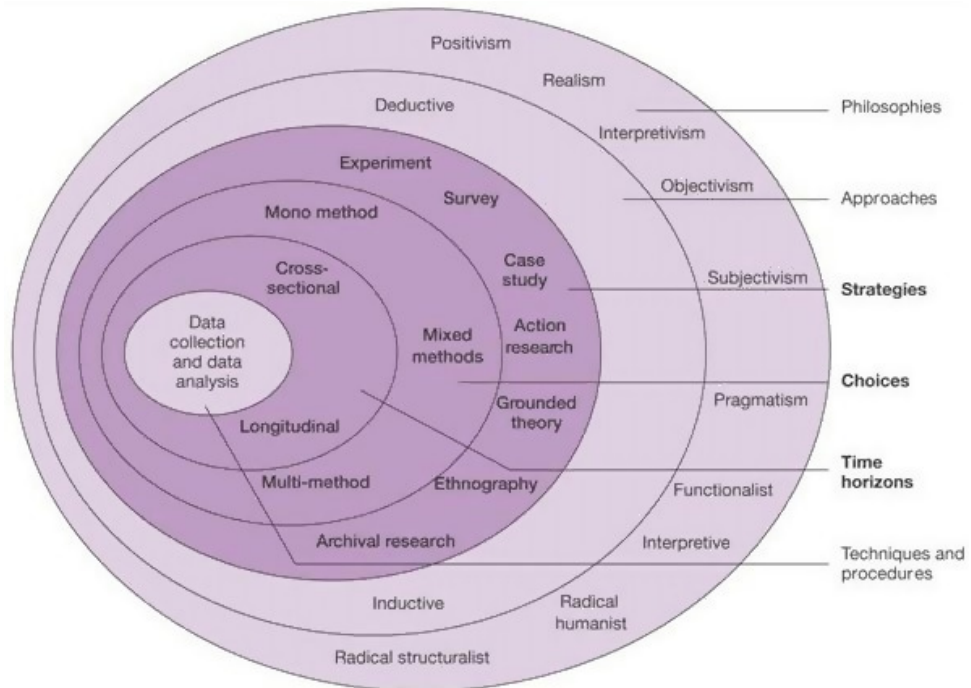
Figure 2-2 Research onion (adapted by Sunders, Lewis and Thornhill (2012))

9

2.2.2 Research Philosophy

The research philosophy is defined by the way the researcher assumes the world, the nature of reality in the world as well as the assumptions for investigating the world. It reflects the researchers' perception and thinking, constituting the conceptual framework setting the basis for the beliefs and assumptions that support the researchers' work towards achieving their research objectives (Holden & Lynch, 2004). All the above-mentioned philosophical stances are defined by two terms, i.e. the research ontology and the research epistemology:

- *research ontology* defines the researcher's assumptions with regards the nature of reality, and
- *research epistemology*, defines the assumptions with regards the approach to inquire the nature of the world

Furthermore, the *axiology* of the research is of particular interest as well. Axiology is a reflection of the views of the researcher on the role of values in research. The techniques employed and selected for the data collection are affected by the researcher's stance with regards the ontology, epistemology and axiology of the research.

A number of research hand books have been published for helping researchers decide the research paradigm and philosophy that is the most appropriate for their research (Gibson & Gareth, 1979), (Eastman & Bailey, 1996), (Holden & Lynch, 2004), (Hirschman, 1986), (Tuli, 2010), (Taylor, 2008). Johnson (2007) have concluded that the main research philosophies within the business and management fields are *positivism, interpretivism, realism* and *pragmatism*. In table 2-1 the most important characteristics of each one of these research philosophies are presented and compared (Saunders, Lewis, & Thornbill, 2000). The two extremes are positivism and interpretivism, with the former related with objectivism, and the latter related with human interests and thoughts (Cooper & Schindler, 2006). The other two prominent philosophies are *realism* which is based on the idea that reality is independent from the mind (Phillips, 1987), and *pragmatism*, that is based on the idea that more than one research strategy are necessary to address real world problems (Taylor, 2008).

Table 2-1 Comparison of the most prominent research philosophies (based on the work presented by Saunders, Lewis, & Thornbill, (2000))

	Positivism	**Realism**	**Interpretivism**	**Pragmatism**
Ontology	Reality is coming from the external environment; it is objective and does not depend on the social actors	Reality is objective; It exists independently of the human beliefs and thoughts, pre-existing knowledge. It is interpreted through social conditioning.	Reality is socially constructed; it is subjective and may change in time. There are multiple realities.	Reality is external and multiple. Its vie is chosen to best enable answering the research questions posed.
Epistemology	Only observable phenomena can provide credible data, facts. The focus is on causality and law like generalisations, reducing phenomena to simplest elements	Observable phenomena provide credible data, facts. Insufficient data means inaccuracies in sensations. Alternatively, phenomena create sensations which are open to misinterpretation. Focus on explaining within a context or contexts.	Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meanings motivating actions.	Either or both observable phenomena and subjective meanings can provide acceptable knowledge dependent upon the research question. Focus on practical applied research, integrating different perspectives to help interpret the data.
Axiology	Research is undertaken in a value-free way, the researcher is independent of the data and maintains an objective stance.	Research is value laden; the researcher is biased by world views, cultural experiences and upbringing. These will impact on the research.	Research is value bound, the researcher is part of what is being researched, cannot be separated and so will be subjective	Values play a large role in interpreting results, the researcher adopting both objective and subjective points of view

Data collection techniques	Highly structured, large samples, measurement, quantitative, but can use qualitative as well	Methods chosen must fit the subject matter, quantitative or qualitative	Small samples, in depth investigations, qualitative	Mixed or multiple method designs, quantitative and qualitative

The overall research aim of the present study is to develop a novel model for predicting the impact of strategies and changes that manufacturing companies might experience with regards their employees' performance. In this line, the conducted research is intended to propose, design, develop, validate and test a novel model. In order to do so, the deep understanding of the current practices that manufacturing organizations are employing with regards the monitoring and improvement of employee performance is critical. This will be addressed by conducting an exhaustive and objective literature review in order to give an in-depth insight into the current trends in employee performance and, on the other hand, surveys (mainly based on quantitative questionnaires) within the real manufacturing scenario in order to deeply understand the current manufacturing situation. Then, the conducted research is intended to analyse the current manufacturing situation regarding employee performance, describing and pointing out the most relevant contributions to the field, as well as by collecting specific and precise data from the real manufacturing environment. In this way, based on these analyses, the findings will be able to be generalised towards, in a first stage, developing and, in a second stage, validating a novel model. In this sense, the research philosophy of the conducted research can be related to the positivism, which is tightly related to the objectivism, based on the idea that reality is stable, observable and describable, being mainly focused on data collection and interpretation towards proving (or rejecting) hypotheses, making special emphasis on the statistical analysis and the generalisation of the results. In addition, further links between the positivism and the conducted research can be found regarding the way in which the research is carried out since, within the positivist framework, researchers resort mainly to the quantitative approach, as it

is the case of the conducted research, being their observations not influenced by human factors and minimising their interaction with the research participants.

It is important to highlight that, although mainly based on quantitative questions, the questionnaires used to conduct the surveys also include some qualitative questions. In this way, it is intended to analyse the practitioners' opinions and thoughts regarding employee performance and how this can be improved, and their perceptions about the current practices within their companies. In this case, the research would also include qualitative aspects, allowing it to be related to interpretivism, which usually resorts to qualitative methods, such as, interviews and observations, enabling the researcher to directly experience and share practitioners' environment to better understand their opinions.

According to the above discussion, the conducted research involves positivist as well as interpretivist points of view. In this context, to combine both research philosophies and resort to each one of them whenever it is necessary appears to be the best strategy to conduct the present research. Saunders, Lewis, and Thornbill (2000), suggested that whenever the research question does not unambiguously imply the adoption of positivism or interpretivism, the pragmatist philosophy allows working with both philosophies. Several researchers favour the multi-paradigmatic research, arguing that multi-paradigmatic research gives the researcher more freedom and flexibility as well as a wider range of tools to conduct his research (Taylor, 2008). Furthermore, a fundamental argument of the pragmatic philosophy is that the adoption of the research philosophy is mostly determined by the research question rather than by the researcher's beliefs. In this line, Tashakkori and Teddlie (1998) argue that the pragmatic position allows researchers to focus exclusively on answering the research question, considering the research aim more important than any (pointless) debate about which research paradigm should be adopted. In such a context, the pragmatist philosophy is adopted to conduct the present research in order to be able to apply positivist or interpretivist philosophies whenever the researcher deems it necessary, basing his decision on practical convenience rather than on theoretical assumptions, being allowed to focus exclusively on the core of the

research, that is, on answering the research question towards achieving his research objectives in terms of filling the current gap.

2.2.3 Research approach

As can be seen in figure 2.2, two main research approaches exist. The *deductive* and the *inductive*. The decision that the researcher reaches with regards the research approach to be adopted is related to how the testing facts and the research findings are considered in order for the researcher to reach conclusions. The *deductive* approach is a top-down approach consisting in developing a theory, followed by formulating hypotheses, collecting and analysing the data, to finally accepting (or refuting) the formulated hypotheses. In this way, the deductive approach allows the researcher to obtain empirical evidence of the studied phenomenon (Cavana, Delahaye, & Sekaran, 2001). The *inductive* approach, on the other hand, is a bottom-up approach, moving in the inverse direction, starting with the observation of the phenomenon, followed by the analysis of the different found patterns and themes towards establishing their relationship (if any), to finally arrive at the development of a theory (model).

As mentioned already, the present research starts with a thorough literature review (collection of secondary data) and follows a survey (primary data) for evaluating the current practices with regards employee performance in the UAE manufacturing sector. Then, based on the analysis of the collected data, a set of hypotheses is developed regarding the factors that contribute to the employee performance. Based on these hypotheses, a system dynamics model is designed for predicting the impact on the employee performance when specific factors are changed.

Based on this approach and the characteristics of the deductive and inductive approaches as they have been introduced, it can be stated that the conducted research is mainly inductive. In particular, the inductive approach has the advantage of being based on a more flexible structure than the deductive one, providing the researcher more freedom to conduct his research.

2.2.4 Research strategy

As can be seen in the research onion figure (figure 2.2), there are several research strategies to choose from. The most usually ones that are frequently found in the literature include surveys, action research, case studies, experiments, grounded theory and archival research. The following four groupings can be highlights:

- *Case studies* focus on specific real cases or situations. These then are studied and investigated in-depth. Such cases can be a company, an organization or a whole supply chain. In case study research approach, data and information can be sourced from different alternative sources. Such information can be collected through observations, survey, interviews, analysis of reports and documents, etc.. Data can be qualitative, quantitative or a mix of both.

- *Interviews* are considered as sources of qualitative information and can have different forms such as structured, semi-structured, unstructured, etc. The key advantage when employing interviews as a research approach is the rich information that the interviewer gets access to, which however is in most of the cases unstructured and require a lot of post-processing. They require thus extensive planning concerning the development of the structure, decisions about who to interview and how, whether to conduct individual or group interviews, and how to record and analyse them. For interviews to be successful, the interviewees need a skill set that will enable the facilitation, such as good social, listening and communication skills.

- *Quantitative surveys* are widely used methods in research. They are preferable when the research requires participation of many respondents. They are based on questionnaires that required the really well-prepared questions for collecting valuable data. In a number of handbooks rules for developing questionnaires have been derived. During the design stage of the survey, the researcher needs to decide on the size of the sample and whether and when this is representative of the whole population studied. Surveys can be administered to the whole population under investigation.

- *Action research* is frequently used for practical business research. It refers to refers to a wide variety of evaluative, investigative, and analytical research methods designed to diagnose problems or weaknesses. It helps researchers to develop practical solutions. Action-oriented research is a participatory process which brings together theory and practice, action and reflection.

In general, the selection of the research strategy is highly based on practical issues, such as, the previous existing knowledge, the available amount of time and data, and the accessibility of the potential participants (Saunders, Lewis, & Thornbill, 2000). In the conducted research, different research strategies are combined in order to answer the main research question and achieve the research objectives.

2.2.5 Research choices

As shown in the research onion (Figure 2.2), two different methods can be chosen to conduct the research, namely *quantitative* and *qualitative*. Quantitative research is focused on systematically studying a phenomenon by gathering quantifiable data that can be analysed resorting to statistical, mathematical or computational techniques (Creswell, 2003). Quantitative data collection methods are usually highly structured, including different types of surveys, such as, online, paper and mobile ones. On the other hand, qualitative research is mainly exploratory, being used to understand reasons, opinions and motivations, allowing researchers to actually be involved in the experience and perform a highly detailed analysis. In general, qualitative research collects data by using unstructured or semi-structured techniques, such as, focus groups and individual interviews, and analyses data by procedures, such as, categorising data, that support non-numerical data.

In order to take advantage of both quantitative and qualitative research choices, mixed methods can be adopted as well. In general, mixed methods are used to triangulate, that is, to validate data by analysing its convergence; to complement, in terms of further explaining the obtained results; and to develop, that is, to collect, sample or analysis further data (Greene, Caracelli, & Graham, 1989).

The conducted research is mainly quantitative. Quantitative research, which is highly data oriented, uses research templates that are objective and investigational in nature, such as the surveys used in the conducted research, aimed at collecting quantifiable data that can be analysed resorting to mathematical and statistic methods in order to achieve statistically significant results, in the sense of being unbiased and capable of reflecting the characteristics of the whole sampled population. The main characteristics of quantitative research are as follows:

- Use of structured tools, such as, surveys, to collect quantifiable, in-depth and actionable data.
- Use of significant sample size.
- Use of close-ended questions.
- Study of different aspects of the phenomenon being researched before data is actually collected.
- Use of tables, charts and graphs to represent data.
- Generalisation of the obtained results.

2.2.6 Time horizons

Depending on the available time and the purpose of the research, research can conducted as cross-sectional research, where different variables are evaluated at a particular point in time, or longitudinal research, where it is possible to analyse different variables at different intervals of time in order to observe changes across the time (Saunders, Lewis, & Thornbill, 2000).

2.2.7 Techniques and procedures

The last stage in the research onion has to do with the selection of the techniques and procedures to perform the data collection and analysis within the selected research framework. In a first stage, data is collected resorting to quantitative methods. Specifically, primary quantitative data is collected by a survey using a likert scale (close-ended) questionnaire, and secondary quantitative data is collected by different literature reviews regarding. In a second stage, based on the primary and secondary quantitative data analyses, the basic knowledge for

setting up the model is established. Finally, in a third stage, new primary quantitative data is collected resorting to a second survey, in order to validate the proposed combination model.

In order to ensure the data collected via the conducted surveys is statistical significant, as well as to ensure the obtained results from the corresponding data analyses are acceptable, valid, meaningful and, even more important, generalisable, it is mandatory to validate the performed surveys (Collingridge, 2014). In this line, the questions included in the questionnaires used for collecting the data are validated for assessing their dependability. This validation process includes, on one hand, the pre-process of the collected data from the questionnaires in order to properly prepare it to be analysed and, on the other, the data analysis based on carefully selected statistical methods so that the reliability of the results can be ensured. In order to do so, the following six steps, as suggested by Collingridge (2014) are adopted:

- Face validity: The survey is reviewed by two different parties. On one hand, the questions included in the questionnaire are reviewed by experts in the research field capable of evaluating whether they are suitable for successfully capturing the research interest in order to give an in-depth insight into the current lean and green manufacturing situation within the real scenario. On the other, the questionnaire is evaluated by an expert on question construction, in order to eliminate common errors, such as, leading, confusing or double-barreled questions.
- Pilot test: In this stage a pilot study is run on a sub-sample of the survey participants to detect irrelevant or poorly formulated questions so that they can be replaced, eliminated, or reformulated.
- Clean collected data: In order to be able to analyse the collected data, the data is pre-processed according to the following steps:
  - Data entering: In order to minimise the risk of errors, one person reads the values aloud while another enters them into the spreadsheet.

- Reverse code negatively phrased questions: Whether responses from careful respondents evidence a correspondence between negatively and positively phrased questions is evaluated.
- Minimum and maximum values are double-checked for all the collected data to find errors in data entry.
- Use Principal Components Analysis (PCA): PCA, which is a well-known statistical tool, is used to identify the underlying elements measured by the survey.
- Check Internal Consistency: In this step, the internal consistency of the questionnaire is evaluated through the standard Cronbach's Alpha (CA) test, in order to test the reliability of the questions as well as to ensure their answers are consistent.
- Revise the survey: The final step consists in revising the survey based on the results of the PCA and CA analyses to decide whether to eliminate or reformulate questions that do not belong to the principal themes or that are not consistent.

2.3 Research structure

Based on the analysis of the alternative research options, the research structure was clarified. It is composed on a number of phases, shown in different colours in the figure 2-3. The phases in summary are:

- Phase I: formulation of the research problem (orange)
- Phase II: literature review of relevant studies (grey)
- Phase III: analysis of employee performance practices in the UAE (blue)
- Phase IV: modeling of employee performance (brown)
- Phase V: develop of auditing of practices and link to models (green)
- Phase VI: validation of the approach (yellow)
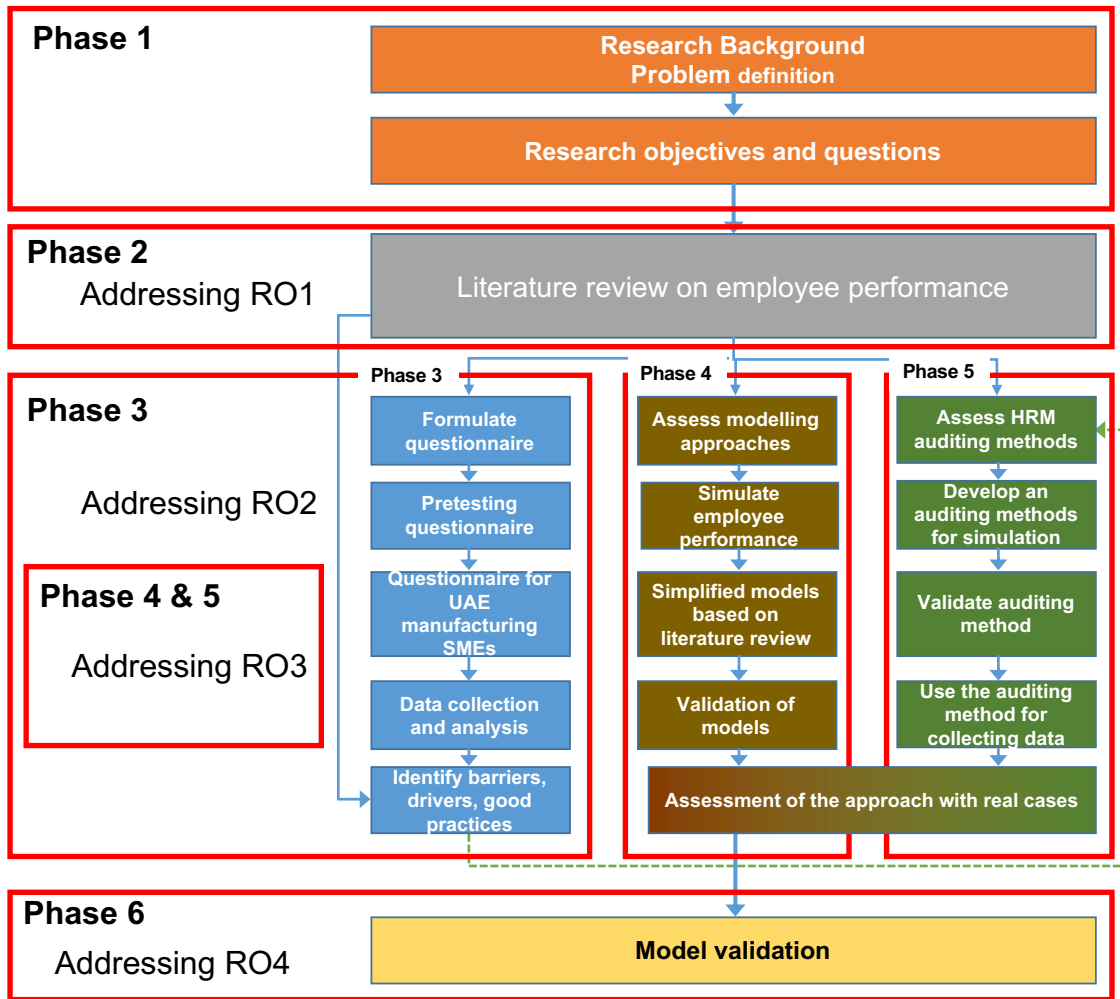
Figure 2-3 Research methodology outline

Focusing on each of the research objectives set, the approach is going to be:

RO 1: To analyse the current global trends in employee performance assessment and employee performance improvement through a thorough literature review focusing on how lean principles can improve these

This objective is to be achieved through an extensive literature review of the most recent articles, papers, MA & PhD theses in the field of HR Management relating with the employee performance especially in the developing countries. This is related to phase 2 that has been identified in the research methodology.

RO2: To assess the current practices with regards employee performance in the UAE based manufacturing companies focusing in identifying (i) the methods used for employee performance assessment, (ii) the factors that affect employee performance, (iii) the ways adopted for improving employee performance and their efficiency

This objective it to be achieved through the development of a questionnaire and a survey that will be address these points. The analysis of the data will answer the three set research questions. This is related to phase 3 that has been identified in the research methodology.

RO3: To develop model for the continuous improvement of the employee performance in the manufacturing companies in the UAE, including the guidelines and the associated processes.

The developed model will be based on the use of causal loop diagrams identifying the key variables that impact the employee performance. In phase 4, the basic models were developed and tested for proving the concept and approach in 4 manufacturing companies in the UAE. In phase 5, an audit method was developed for collecting data based on structured interviews that are fed into the models. Based on the collected data, real case models will be developed.

RO4: To validate the model based on case studies.

The developed model will be validated for two companies in the UAE for assessing different policy changes and their dynamic impact on the employee performance. Before validating, the models will be verified for a number of hypothetical scenarios and comparing the predictions with what literature is reporting.

2.4 Chapter Summary

Research methodology is the systematic approach used by researchers to conduct their research within a particular paradigm or theoretical framework (Mackenzie & Knipe, 2006) in order to solve the research problem, answer the

research questions and achieve the research objectives. In this chapter, the research methodology adopted to conduct the present research has been introduced, each one of its stages has been described, and the particular research choices that have been made towards achieving the conducted research objectives have been discussed.

3 LITERATURE REVIEW

3.1 Introduction

Chapter 3 summarized the literature review methodology and the highlights of this review. In figure 3-1, the positioning of the chapter within the whole thesis is shown.
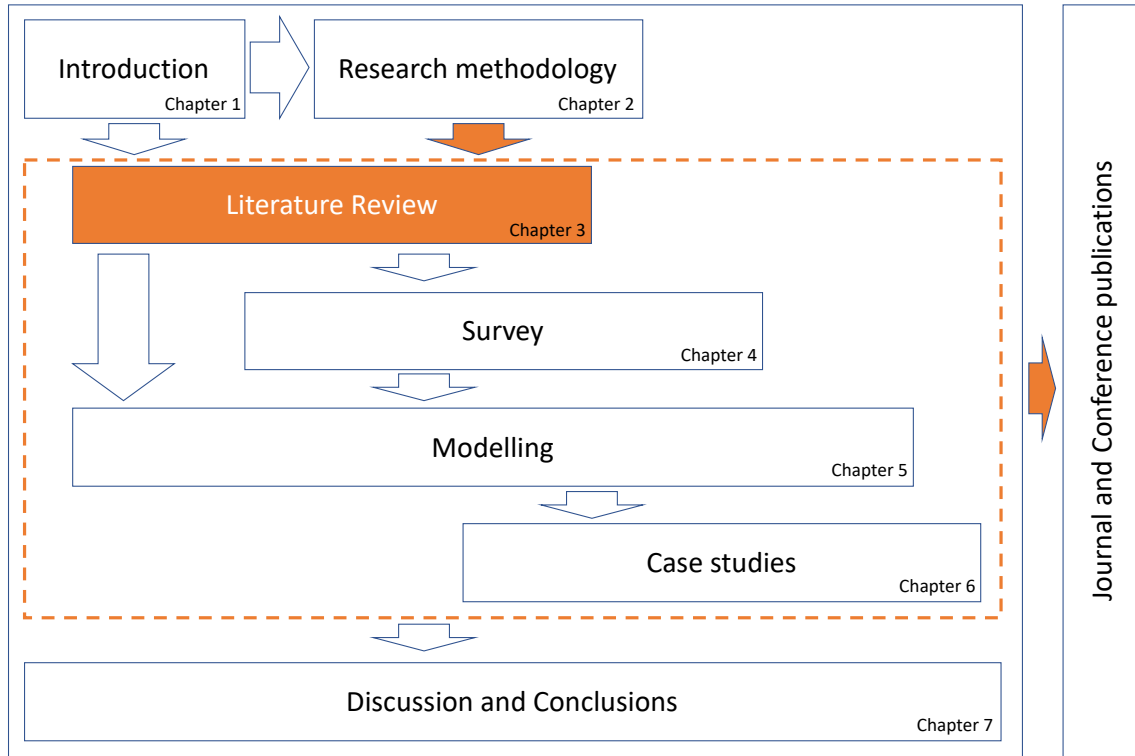
Figure 3-1 Chapter 3 within the whole thesis

The starting point is a set of literature review questions. These are:

- How can the employee performance be measured?
- How can the employee performance improved?
- How can a continuous improvement mindset to all the employees be introduced and sustained?
- What are the factors that prohibit and that enable continuous improvement?

23

- Can lean management principles help in improving the employee performance?
- Are there any modelling methods that can be used for simulating this problem?

The literature review is based mainly on peer reviewed papers published on journals. Several academic databases and search engines such as Google Scholar, Scopus, Science-direct and Springer-link were accessed for finding relevant studies.

The key topics that were to be covered in the literature review are graphically shown as a mind-map in figure 3-2. The mind map helps with structuring the knowledge to be captured.
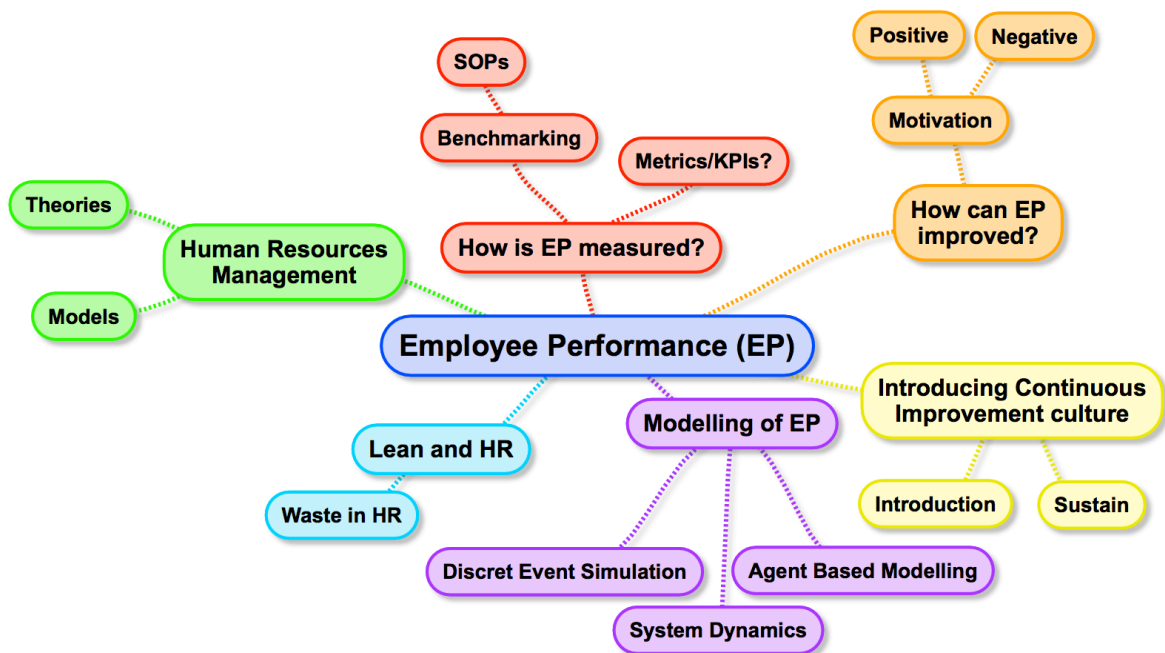
Figure 3-2 Literature review questions and mind-map

The key findings for each question are listed hereafter. However, the first section will provide a set of definitions.

3.2 Employee performance

Employee performance management is critical in HRM. Through employee performance management, the senior management and leadership attempts to align the organizational objectives with the employees' agreed key performance indicators (KPIs). Such KPIs include measures, skills, competency requirements, development plans and the delivery of results. The focus thus of this process is the improvement, learning and development of the employees as for them to be able to contribute effectively in the overall business strategy.

Initially the management of employee performance was only linked to deciding the salary level that each employee should be paid. However, such an approach does not account for employees who are not motivated only with financial rewards.

A number of studies have been presented addressing employee performance. Indicatively, Waheed (2011) defined employee performance as the employee productivity and output because of employee development and related that with the organizational effectiveness. Saeed et al. (2003) studied the factors that affect the performance of employees.

3.2.1 Theories describing employee performance and behaviour

A number of theories have been developed in the last 60-70 years that attempt to explain the behaviour of human beings in their work environment. Indicatively the most well-known ones include the following:

<u>Theories X and Y</u>: McGregor (1960) developed two opposite theories that describe human behaviour. The Y theory is based on the idea that employees that are enjoying working, are self-motivated and creative. Thus, it is assumed that employees are happy to take responsibility and ownership of their work, and keen into new challenges. In contrast, X theory is based on the assumption that employees are working out of necessity and not enjoying their working life, and are unmotivated.

<u>Theory Z</u>: This is a group of theories that are considered to be the evolution of theories X and Y. Examples of such theories include the ones developed by Maslow (1973), Ouchi (1981) and Reddin (1970). The underlying assumption of these theories is that employees are looking for safety and employers can provide this through stable employment for life. As a result of this stability, employees show high productivity, and increased morale and satisfaction by their work.

<u>Hierarchy of needs</u>: Maslow (1943, 1954) after studying a number of successful individuals, suggested that the individual's behavior is determined by the strongest need at a particular moment. He classified needs in five categories, that are usually presented in the form of a pyramid.

It is obvious that the theories were developed long time ago. More recent studies are based on these theories and focus on specific variables that can have an impact on the employee performance, and will be presented in detail in the next sections.

3.2.2 Measuring employee performance

The current trend with regards the measurement of the employee performance include the assessment of each employee on specific time intervals, usually quarterly or annually. Through this assessment, challenges are identified and areas for improvement along with the ways of improving them are discussed and agreed.

The assessment is known also as employee performance appraisal, and is based on evaluating the employee according to his performance. Traditional Appraisal systems include a review of weather the employee achieved the objectives set in his/her previous assessment. It might include a pay review or the reward of a bonus. The outcome of such an assessment is important for considering promotion. In such reviews both the line manager and the HR managers are included.

One of the most prominent tools to measure employee performance is through the use of performance indicators or key performance indicators (KPIs). They are widely used in all types of organizations to evaluate the success of the whole

organization or of a particular activity in which it engages. Often success is simply the repeated, periodic achievement of some levels of operational goal (e.g. 100% customer satisfaction, zero defects, zero near-misses, etc.). However, in many cases success is also defined in terms of making progress toward strategic goals. It is so important to select the right KPIs that relies upon a good understanding according to the priority, what is important and what is not. 'What is important' often depends on the department measuring the performance - e.g. the KPIs useful to finance will really differ from the KPIs assigned to sales. Therefore, the best performance indicator can been chosen based on the present state and its key activities. A very common way to choose KPIs is to apply a management framework such as the balanced scorecard (Fitz-Gibbon, 1990).

3.3 Improving employee performance

A number practical tips and hints can be used for improving the employee performance. Many can be found in the relevant literature. The common practical tips include the improvement of employee engagement. This can be achieved through: better communication of the organization's goals and how these are affecting the individual's goals, encouraging open communication and sharing of information between managers and employees, reinforcing the culture of the company, team development, encouraging innovation, delegation of authority and decision power, support and development to name few.

A number of studies were reviewed and almost of them converge in the importance of the leadership and the impact the motivation has on the employee performance. Both leadership and motivation have been extensively studied in the last 100 years (mostly by social scientists), and a number of theories attempting to describe them have been developed. In the following two sections, these will be briefly described.

3.3.1 Leadership and employee performance

A common topic on the relevant literature is the importance of leadership in improving the performance of the employees. A number of leadership theories

have been developed. These theories attempt to explain how a leader can shape outcomes under various circumstances. However, by themselves, leadership theories are insufficient for explaining subordinate behaviors so various seminal theories of motivation have been defined.

Over the last century, a number of leadership theories have been proposed. These can be classified into eight groups, that basically describe the different types of leaders:

1. Great Man Theory,
2. Participative Theory,
3. Behavioural Theory,
4. Contingency Theory,
5. Trait Theory
6. Situational Theory
7. Transactional Theory, and
8. Transformational Theory.

These groups differ to each to in several aspects such as characteristics that distinguish leaders from subordinates, situational or environmental factors, skill levels, etc. However, for the needs of the present study, the focus is on how the style of leadership affect the employee performance. In the following table, the findings from the literature review are shown, with supporting references. It should be noted that these theories are overlapping in many cases.

Table 3-1 Leadership theories (in order of appearance in the literature) and employee performance.

Leadership theory	Leadership style	Employee perception by leadership	References
Great man theory	Leadership capacity is a talent. Leader as a hero. Authoritarian style	Followers, either convinced or forced by the leader. Respect or fear. Employees cannot learn and become leaders as well	(Fliedner, 2015)

Participative theory	Participative management and delegation	Leadership engages employees, but the decision authority is with upper management	(Likert, 1967)
Behavioural theory	Great leaders are made, not born. Focuses on actions, not mental abilities.	Employees can learn, alter their behaviour	(Merton, 1957)
Contingency theory	Leadership is directly affected by the environment	The contingency theory emphasizes the importance of both the leader's personality and the situation in which that leader operates	(Fiedler, 1964)
Trait theory	Focuses on personality traits and behavioral characteristics within leaders	Allows the managers to know their strengths and weaknesses and thus get an understanding of how they can develop their leadership qualities.	(Zaccaro et al 2004)
Situational theory	Link leadership style to situations that the leaders face	Leadership style changes according to the employees perfromance	(Hersey and Blanchard, 1969 a & b)
Transactional theory	Managing rather than leading.	Leaders obtaining the efforts of subordinates in exchange for rewards. Classification of employees in 'in-favor' and 'out-of-favor' ones	(Hargis et al, 2011)
Transformational theory	Motivational, inspirational	Focuses on the relationships formed between the leaders and the subordinates	(Bass, 1990), (Hargis et al, 2011)

3.3.2 Motivation and employee performance

As indicated in the introduction of the present section, motivation can be critical for the improvement of the employee performance. Motivation can be both positive (rewards) and negative (punishment) for either acknowledging work done or punishing the work not achieved. Several challenges though exist with using any type of motivation. To name few, rewards might become the goal itself for

the employees, and expect this for performing their work, justice in awarding positive and negative motivation is also an issue. A number of theories have been developed attempting to explain how motivation works for employees. These are shown and briefly discussed in the table 3-2.

Table 3-2 Motivation theories

Motivation theory	Underlying hypothesis / basis	Employee perception	References
Maslow's hierarchy of needs	All human beings possess intrinsic needs that need to be met hierarchically.	Work needs to be able to allow the employee to reach the highest level of self-actualization	(Maslow, 1943, 1954)
Two-factor theory	Developed in the 50s by Herzberg	Proposes both satisfying and dissatisfying job factors (the former motivate whereas the latter demotivate). These factors seem to work independently	(Herzberg et al, 1959)
Theories X and Y	Negative and positive views of employees.	Theory X represent a negative view of employees (leadership assumes that employees are lazy and need supervision) Theory Y represent a positive view of employees (leadership assumes that employees are ambitious, self motivated	(McGregor, 1960)
Expectancy theory	People decide on their behavior based on the expected outcome and how likely this is.	Employees behavior is driven by rewards.	(Oliver, 1974)
Control theory	Behavior is never caused by a response to an outside stimulus, it is determined by the person's desire to maximize basic needs.	The motivation strategy adapted depends on the leader's style.	(Glasser, 1984)

Goal-setting theory	People are pursuing success, and therefore are motivated by challenging goals.	Leadership sets challenging but realistic goals for challenging and motivating employees.	(Locke and Latham, 1990)
Positive psychology	Offers an optimistic view for people, getting away from the predominant negative bias of traditional psychology. Linked to the transformational theory of leadership	Establish positive working environments for employees to strive continuous improvement.	

3.4 Continuous improvement of employee performance

Continuous improvement can be defined as the "ongoing effort to improve products, services or processes" (Liker and Convis, 2012). A more formal definition (as provided by the institute of Quality Assurance): Continuous improvement is "… *focused on increasing the effectiveness and/or efficiency of an organisation to fulfil its policy and objectives. It is not limited to quality initiatives. Improvement in business strategy, business results, customer, employee and supplier relationships can be subject to continual improvement. Put simply, it means 'getting better all the time*".

The benefits of implementing continuous improvement, as per the literature review are very promising (Bessant et al, 1994). Woods (1997) discussed the benefits for the employees as well, highlighting that continuous improvement can provide a healthy workplace. Cole (2001) argued that continuous improvement can:

- Mobilize employees that results in increased commitment.
- Incremental improvements can lead to a magnification of results and make large changes possible.
- Allows for learning that is based in practice and is more likely to be accepted when it is implemented by the same people who proposed the changes.

- Allows changes to be implemented that are based on tacit knowledge by the employees.

In summary the benefits that continuous improvement can bring to an organization include:

- low capital investment (Jha et al., 1996);
- ideas and suggestions coming from the employees who are closer to the actual work done , (Jha et al., 1996; Goh, 2000; Taylor and Hirst, 2001);
- increased employee commitment (Temponi, 2005);
- improved performance/quality (Chassin, 1997; Goh, 2000);
- reduction of waste (Gallagher et al., 1997);
- improved customer satisfaction (Gallagher et al., 1997; Taylor and Hirst, 2001)

Continuous improvement has been considered a core element in a number of different manufacturing philosophies, including lean and six sigma. However, in both these philosophies, continuous improvement (or kaizen) refers primarily to the improvement of processes, products and methods; and does not directly refer to the continuous improvement of the employees performance. Nevertheless, for achieving high levels of kaizen, the employee performance needs to be improved as well.

In many instances, the continuous improvement is views as a formal process with specific steps, as shown in figure 3-3. Usually this cycle follows the 6-sigma approach of PDCA (Plan-Do-Check-Act).
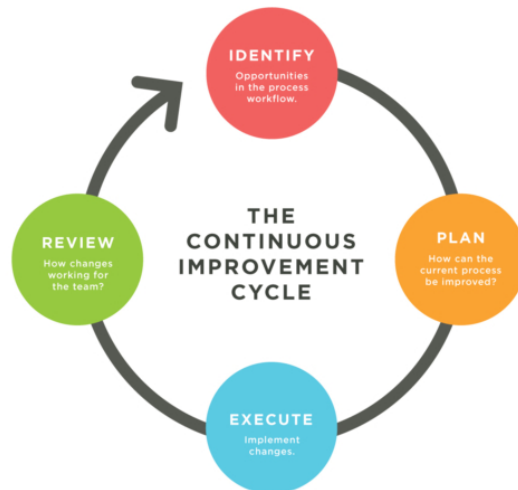
Figure 3-3 Continuous improvement cycle

Through the implementation of such approach, specific processes/procedures are improved. This improvement though indirectly can improve the performance of the employees. The continuous improvement of the employees can be thus improved from such a process.

In a number of studies, the factors that are critical in the successful implementation of continuous improvement initiatives has been discussed. Fryer et al. (2007), after reviewing 29 relevant papers, listed these critical factors and are shown graphically in figure 3-4. Since the basis for his review was papers coming from manufacturing projects, some of these critical success factors may not be applicable for the case of HRM.
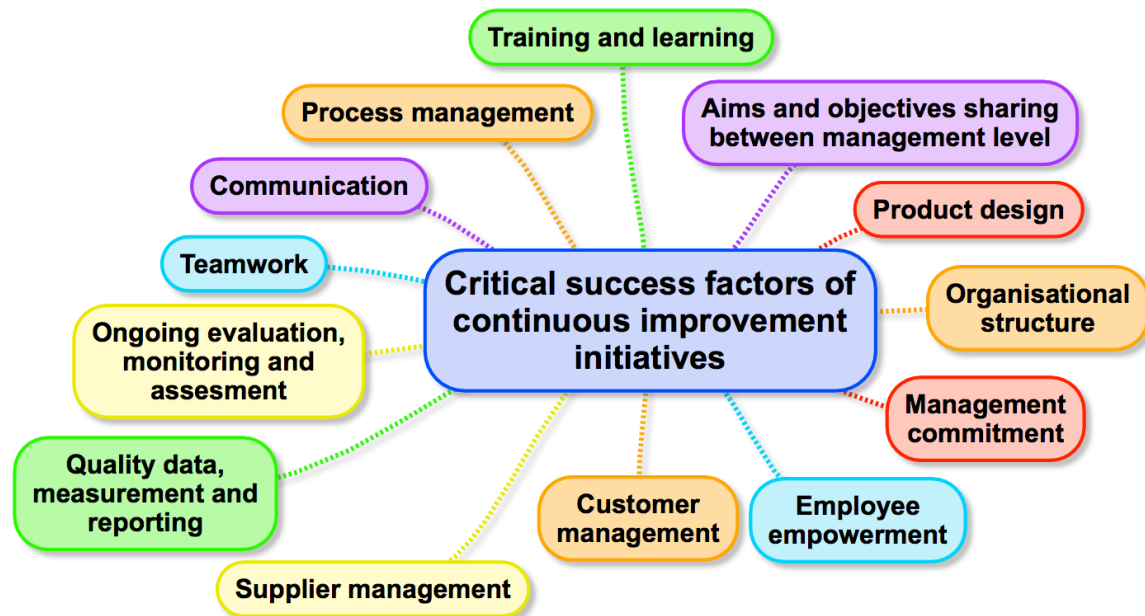
Figure 3-4 Critical Success Factors of Continuous improvement initiatives (based on Fryer et al, 2007)

In terms of barriers and challenges when implementing continuous improvement initiatives, in a number of studies these have been discussed. Bessant et al (1994) and Gallagher et al (1997) identified the culture of the organization as critical. Dewhurst et al. (1999) found the main barrier to be the lack of definition of the customer, the rigidity of the organization and the lack of incentive to improve customer satisfaction for the case of monopolies. Again, these barriers are not necessarily applicable to the case of HRM.

3.4.1 Models of employee performance

A number of models have been presented for simulating the employee performance. In almost all of them, the key elements include the ability of the employee that is exhibited through her/his skills, the various motivation approaches / incentives that the employer adopts, and the opportunity offered to the individual to participate.

Appelbaum et al. (2000) assume that people perform to their best if they come equipped with knowledge, skills, and abilities. As mentioned in the previous paragraph, they also need to be motivated and have the opportunity to participate. The set of knowledge, skills, abilities, motivation, and opportunity

34

form the core of the so called AMO theory. This theory was established on the assumption that employee's performance P_i of an individual i is a function of her / his ability A_i to perform, her / his motivation M_i to perform, and the opportunity to perform in the job O_i (Boxall and Purcell, 2011):

$$P_i = f(A_i, M_i, O_i)$$ **(3-1)**

The AMO theory is well established in research since it was first proposed in 2005 (Boselie et al., 2005). The ability A_i to perform does not focus only on the abilities, but reflects both the employees' knowledge, their skills and their abilities.

Purcell et al. (2003) developed the so called "People and Performance Framework" based on two main assumptions. The first one suggests that all employees have the capacity to engage in discretionary behaviour and it is the ability of the organization to trigger such useful behaviour, beyond meeting basic job requirements, that leads to higher performance. The second one is that line managers are critical for improving the levels of employee job satisfaction and commitment which will in turn encourage employees to exercise their discretion and act beyond their in-role behaviours. The "People-Performance Framework" is composed of four pillars as can be seen in figure 3-5. Pillars 2 and 3 are considered to be within the "black-box of HRM". Pillar 2 includes the three elements that was highlighted in the AMO theory previously, namely "Ability", "Motivation" and "Opportunity". Pillar 3 addresses the line manager and the management / leadership style adopted.
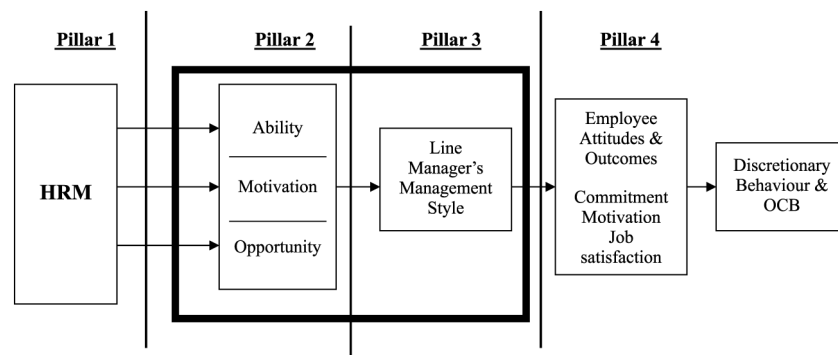
Figure 3-5 The people-performance model (based on Purcell et al., 2003))

3.4.2 Factors affecting employee performance

There is a plethora of factors that can affect the employee performance. A number of publications have been presented highlighting the impact of one or more of the factors, usually based on empirical studies. In a recent literature review study, Atatsi et al. (2019) presented a comprehensive structured literature review of the topic, focusing however on the context of Africa. Their analysis was mostly on the traits of the individuals within an organization (such as altruism, Conscientiousness, Sportsmanship, Curtesy and civic virtue) and how through individual learning and team learning the employee performance can be improved.

Diamantidis and Chatzoglou (2019) in a similar study, they have identified 13 factors and investigated the interrelationships among these. They have grouped the factors into three groups; "firm / environment related factors", "job related factors" and "employee related factors".

As highlighted in the previous section (Boxall and Purcell, 2011), the performance of employees can be considered a function of their abilities, the motivation and opportunities in the organization.

The literature search on factors affecting the employee performance resulted in a list of 140 relevant papers. In table 3.3, the outline of the research analysis is shown, where the 23 most frequently arising factors are listed.

Table 3-3 Factors affecting employee performance

	(Mot) Motivation	(EWB) Employee well-being	(WR) Work recognition	(HRPract) Human Resource practices	(Learn) Learning	(JSat) Job satisfaction	(Lead) Leadership style	(OrgCom) Organization commitment	(Abs) Absenteeism	(Just) Justice - Equal effort	(Train) Training	(OrCult) Organizational culture	(EmpEng) Employee engagement	(Rew) Reward system	(Wcond) Workplace conditions	(Career) Career development	(Social) Social exchanges	(WBProf) Well-being programmes	(WorkLife) Work - life balance	(Flex) Flexible working arrangement	(Envir) External environment
Al-Dmour et al. (2018)	X	X							X		X		X								
Almatrooshi et al. (2016)						X	X						X								
Alnuaimi (2013)							X														
Anitha (2014)		X					X			X			X		X	X				X	
Appelbaum et al. (2000)	X	X		X																	
Aryee et al. (2002)																	X				
Aryee et al. (2012)				X																	
Atatsi et al. (2019)					X						X										
Austen et al., (2013)										X					X	X					
Bakke (2005)		X																			
Baptise (2008)		X			X			X	X				X		X		X	X	X	X	

	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
Bass (1985)							X														
Becker et al. (1997)				X																	
Beer et al. (1984)								X													
Behery and Paton (2008)										X		X									
Boehm et al. (2015)							X					X	X								
Boxall and Macky (2009)					X							X									
Boxall et al. (2016)				X																	
Bramley, (2003)					X							X				X					
Bratton and Gold (2003)		X																	X		
Brown and Benson (2003)			X		X							X			X			X			
Brüggen (2015)						X				X					X					X	
Caruth and Humphreys (2008)			X											X	X	X		X			
Chen (2004)							X					X	X								
Chiang et al. (2018)																					X
Cook and Crossman A (2004)														X	X	X					
Cook and Wall, (1980)								X													
Cooper and Robertson (2001)		X																			
Cross et al. (2000)												X									
Currie (2001)		X																			

	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
De Menezes and Kelliher (2016)		X																	X	X	
Deal and Kennedy (1982)												X									
Delery (1998)				X																	
Dhir and Shukla (2019)															X						X
Diamantidis and Chatzoglou (2019)				X	X			X			X	X			X						
Eisenberger et al. (1990)																	X				
Erdogan (2002)					X						X			X				X			
Farhani (219)	X						X				X										
Farrell and Stamm (1998)								X													
Fry (2003)	X						X														
Gang Wang et al. (2011)							X														
Ganguly, 2010																					X
Garg and Rastogi (2006)	X			X		X	X	X							X	X	X		X		
Gellert and Schalk (2012)																	X				
Geyer and Steyrer, (1998)							X														
Gould-Williams (2004)		X					X							X			X	X			
Greenleaf (1977)							X														
Guest (1999)				X								X									
Guest (2004)												X									
Guest (2011)				X																	

	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
Gul et al. (2012)							X														
Haas and Deseran (1981)																	X				
Hador (2016)						X						X			X		X				
Handoko (2000, p. 37)			X			X	X					X		X							
Harney and Jordan (2008)	X				X	X	X	X													
Heffernan and Dundon (2016)				X						X											
Hilda (2011)							X				X										
Hitka and Sirotiakova (2009)	X		X		X									X	X				X		
Hofstede (2011)																					X
Houston (2005)		X																	X	X	
Jernigan et al. (2002)						X															
Juniper (2010)		X																	X		X
Jyoti and Bhau (2015)						X															
Kalhoff et al. (2011)											X										
Karatepe (2013)													X						X		
Keeping and Levy (2000).			X									X		X					X		
Kehoe and Wright (2013)						X															
Kersley et al. (2006)		X																			
Khan and Nawaz (2016)						X															

	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
Khoreva and Wechtler (2018)	X	X		X													X	X			
Kia et al. (2019)	X					X	X						X				X				X
Kim and Yoon (2015)							X					X	X								
Kozlowski and Klein (2000)												X									
Kundu et al. (2019)						X	X	X				X	X		X						
Legge (1995)							X														
Liao et al. (2009)				X																	
Lichtenthaler and Fischbach (2018)							X							X	X						
Liu et al. (2016)	X													X							
Liu et al. (2017)				X																	
Lowe et al., (1996)							X														
Maamari and Saheb (2018)							X					X									
MacDonald (2005)		X																			
Macey et al. (2009)			X											X	X	X		X			
MacKenzie et al., (2001)							X														
Mehrabani and Shajari (2013)													X								
Melián-González et al. (2015)		X		X		X						X	X		X						

41

	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
Meng and Wu (2015)							X														
Mensah (2015)				X																	
Messersmith et al. (2011)						X															
Mgbere (2009)								X				X									
Otero-Neira et al. (2016)	X			X			X					X	X								X
Pachos and Galanaki (2019)				X																	
Parry, (2003)							X														
Paschal and Nizam (2016)						X						X									
Peccei (2004)		X																			
Pfeffer (2005)		X	X					X						X		X		X			
Prowse and Prowse (2009)			X											X		X		X			
Purcell et al. (2003)	X					X	X														
Rahman et al. (2011)								X													
Ramli (2019)		X				X				X		X			X						X
Ribeiro et al. (2018)								X													
Salau et al. (2014)	X		X									X			X						
Saleem et al. (2019)				X			X	X													
Salman and Hassan (2016)	X						X	X			X	X	X				X				
Schein (1992)												X									

	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
Seibert et al., (2001)																X					
Shahad (2014)												X									
Sharma et al. (2016)				X																	
Shipton et al. (2006)												X									
Siddiqui et al. (2019)	X																				X
Siddiqui and Rida (2019)	X																				
Sihombing et al. (2018)							X	X				X									
Simanjuntak (2001)	X		X	X							X	X					X	X			X
Slocum and Hellriegel (2009)												X									
Sobhani et al. (2017)		X																			
Soomro et al. (2018)		X				X									X		X	X	X		
Stewart (2010)												X									
Sun (2016)		X				X							X								
Tehrani et al. (2007)		X																			
Tetik (2016)		X				X							X								
Van Den Brink et al., (2006)												X									
Van Laar et al. (2007)		X																			
Vigoda-Gadot (2007)							X														
Virga et al. (2019)																			X		X

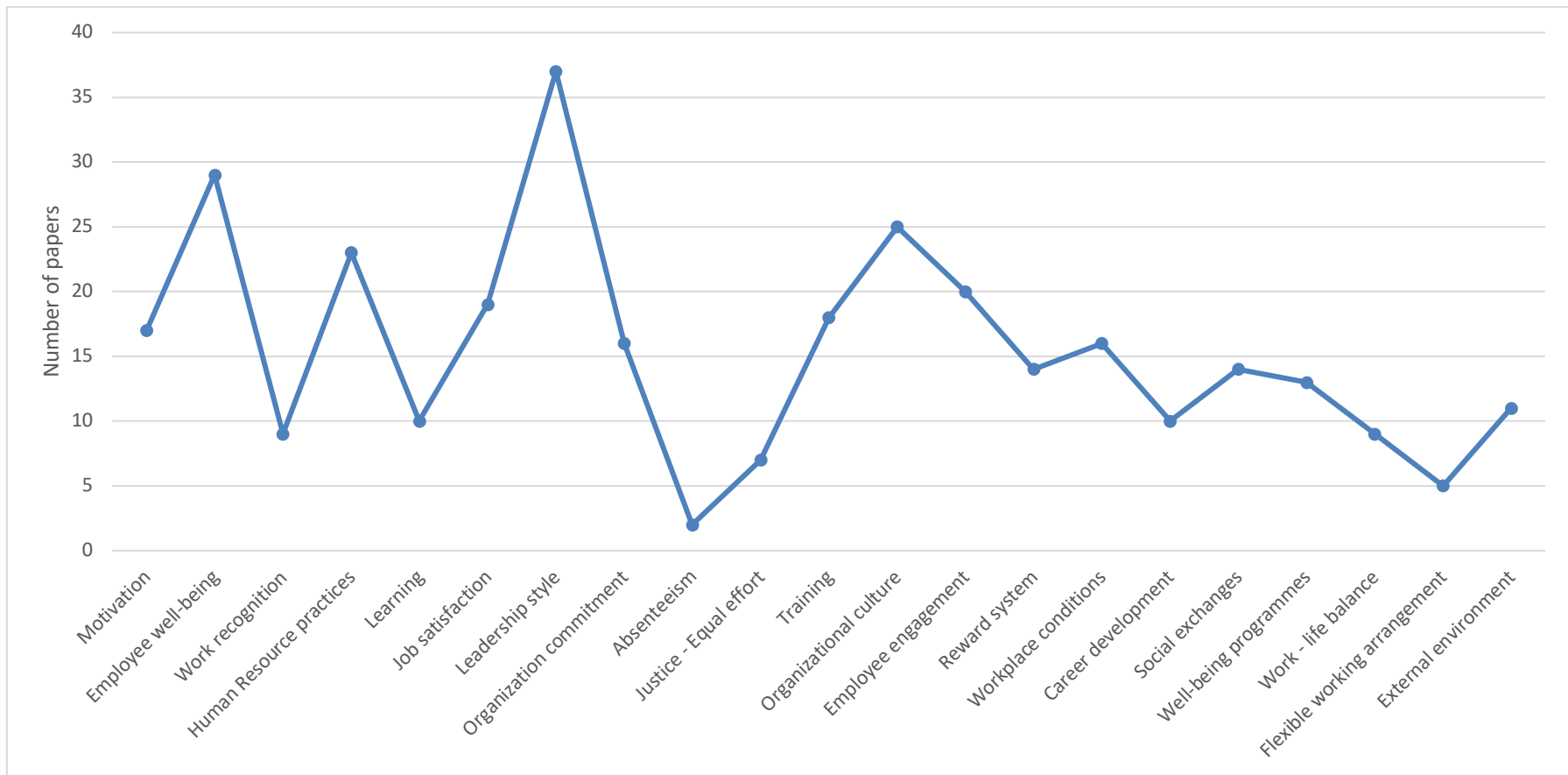|	(Mot)	(EWB)	(WR)	(HRPract)	(Learn)	(JSat)	(Lead)	(OrgCom)	(Abs)	(Just)	(Train)	(OrCult)	(EmpEng)	(Rew)	(Wcond)	(Career)	(Social)	(WBProf)	(WorkLife)	(Flex)	(Envir)
Walumbwa and Hartnell (2011)							X														
Wang et al. (2005)							X														
Warr (2002)		X																			
Wood (1999)				X																	
Wood et al. (2012)						X															
Wright and Cropanzano (2007)		X																			
Wu and Chaturvedi, 2009				X						X	X										
Yamoah and Maiyo (2013)													X								
Ye et al. (2019)		X		X													X				
Yilmaz (2015)		X				X							X								
Zairi (1999)													X								

44

Figure 3-6 Frequency of factors appearing in the literature

<u>Employee well-being</u>

Employee well-being is a complex issue that most of the companies nowadays are trying to improve, as this will ensure that their employees are happy and motivated at work. In the most recent literature publications, wellbeing is related to the environment, the physical state of the employees, the psychological as well as their social existence (figure 3-7).

Figure 3-7 Well-being (adopted from

https://www.morganlovell.co.uk/knowledge/checklists/what-is-employee-wellbeing/)

All businesses strive to be in a healthy state. If their employees are not in a good state of health and wellbeing, this is likely to contribute to successful performance (MacDonald, 2005). The concept of employee wellbeing at work promotes advantages to organisations of having a healthy workforce (Cooper and Robertson, 2001).

A number of publications have revealed that employee well-being has direct impact on productivity. Sobhani et al. (2017) pointed that failing to include health-related factors when optimising systems may lead to underestimating the running costs.

Employee wellbeing at work can also be considered as the physical and mental health that is characterizing the workforce (Currie, 2001). It is evident that for increasing the employee wellbeing, employees need work in a stress-free and physically safe environment. Bakke (2005), in a similar train of thought, linked

wellbeing with promoting an environment that allows work to be received as rewarding, enjoyable, stimulating and exciting. He states that employee wellbeing can help with the financial performance of the whole organization.

For improving employee wellbeing, it needs to be measured as well. Van Laar et al. (2007) developed an assessment process based in six variables, that include career satisfaction, home-work interface, working conditions, general well-being, stress, and control at work.

<u>Motivation</u>

The literature review, as shown in Figure 3-6, revealed that motivation is frequently found in the literature as a factor having an impact on employee performance. Employee engagement is a key element of motivation, which is commonly defined as the factor that makes employees go the extra mile. Anitha (2014) have associated to employee engagement a number of factors, such as: leadership style, engaging teamwork, work environment, prospects of career development, the reward system, organisational policies and workplace well-being.

Motivation is critical within any organization. Hitka and Sirotiakova (2009) identified a long list of factors that can have on the way motivation works internally in an organization. They included: "the scope and type of employment", "the job performance", "working process", "education and personal growth, "good working team:, "the company's reputation", "the opportunity to utilize one's own abilities", "physical strain of a job", "authority", "recognition", "atmosphere at working places", "further financial remuneration", "job stability", "communication at work", "knowledge concerning results of work", "working hours", "working environment", "prestige", "attitudes of supervisors", "individual decision-making", "self-realization", "fringe benefits", "fair assessment of employees", "stress", "psychological stress", "company's vision", "regional development", "company's attitude to the environment" and the level of the "basic pay".

Campbell (1993) highlights that declarative knowledge (e.g. goals, principles), procedural knowledge and skills (e.g. cognitive skills, physical skills,

interpersonal skills), and motivation (choice to perform, level and persistence of effort) are key factors affecting job performance.

<u>Human Resource Practices</u>

Human resource management style and practices are considered to help improve both the overall business performance and the individuals performance (Guest, 1999). There has been growing interest in the notion of "best practice" human resource management sometimes referred to as "high involvement" (Wood, 1999), "high performance work systems" (Appelbaum et al., 2000), or "high commitment" (Guest, 2001).

HRM is responsible for a number of different tasks within an organization, that can be related to employee performance, such as:

- Staffing (Pachos and Galanaki, 2019),
- monitoring and controlling employees (Liu et al., 2017),
- job design (Garg and Rastogi, 2007),
- Performance management system (Sharma et al., 2016),
- Conflict management (Ye et al., 2019),
- talent management (Mensah, 2015), etc.

Khoreva and Wechtle (2018) examined the associations between the skill, motivation and opportunity enhancing dimensions of human resource practices and in-role and innovative job performance through structural equation modelling. They concluded that physical and social employee well-being have an impact on the association between skill- and opportunity-enhancing HR practices and in-role job performance. On the other hand, psychological employee well-being partially mediates the association between motivation-enhancing HR practices and innovative job performance.

Saleem et al. (2019) highlighted the importance of employee empowerment on employee performance. Baptiste (2008) highlighted six HRM practices that signal management's trust in employees and can have a great impact on the performance of the employees. These include:

- Selection practices and internal promotion
- Employee voice.
- Employee involvement, information sharing.
- High compensation contingent on performance.
- Extensive training, learning and development.
- Greater involvement in decision making and work teams

Learning

Learning is defined as the acquisition of skills or knowledge through study or experience, and in the present context this learning is related to abilities that can help employees with their work. As explained in the definition, learning can be sourced to training, either this is as part of a taught programme or as part of "hands-in" practice while performing the job. Further to training, factors such as employee motivation or task complexity need to be considered when evaluating the learning effectiveness of the employees (Sanchez et al., 2013).

Job Satisfaction

Job satisfaction is not only related to the employee's feelings about the work performed but entails the whole of the organization (Jernigan et al., 2002). Wood et al, (2012) describe job satisfaction in the context of employees' vies of their work and work environment. Motivation, as already mentioned, is closely related to job satisfaction. Messersmith et al., after reviewing data from 22 local authorities in Wales, have also identified job satisfaction as one of the critical factors (Messersmith et al., 2011).

Leadership Style

Leadership has a major influence on the performance of organizations, managers and employees as it has been reported in a plethora of publications (Wang et al., 2005), (Vigoda-Gadot, 2006). The various leadership styles can have an impact on the performance of individuals. A number of studies focus on the impact of different models on the employee performance, such as democratic or autocratic,

socially oriented or target oriented, transformational or transactional etc. In the following sections the concept of lean leadership is described in more detail. Also, in previous sections the leadership theories and models have been briefly presented.

The impact of the style of leadership adopted by the management on the performance has been researched a lot. Bass (1985) revealed that there is a high correlation between the leader's transformational style and the organizational performance level. Geyer and Steyrer, (1998), Lowe et al., (1996), MacKenzie et al., (2001) and Parry, (2003) revealed a negative correlation between the transactional leadership style and organizational performance.

A number of studies carried out in the Arab world suggest that leadership in the Arab cultures fosters consultative and participative tendencies (Alnuaimi, 2013). Bussif (2010) claims that the influence of Islamic and tribal values and beliefs on leadership need to be considered, as both Islamic and tribal laws underpin consultation in all aspects of life.

Employee and organizational commitment and absenteeism

The concept of employee commitment refers to the employee's affective reactions to characteristics of his employing organisation (Cook and Wall, 1980). Employees commit to an organisation as they expect certain rewards, which can be extrinsic (salary) and intrinsic (belonging, job satisfaction). Legge (1995) suggests that committed employees show a willingness to exert considerable effort on behalf of the organisation, have a strong belief in and acceptance of the organisation's goals and values, and have a strong desire to be part of the organisation. However, De Menezes and Kelliher (2016) highlighted that the employees' personality and career plans can greatly alter these factors. They indicated how organisational commitment impacts the employees' performance.

Absenteeism indicates a low degree of employee's commitment and dissatisfaction. An individual's commitment and work attitudes are important antecedents to absenteeism (Farrell and Stamm, 1998). Rhodes and Steers,

(1990) suggest that employees who are not satisfied with their work or working conditions can be expected to avoid coming to work.

<u>External Environment</u>

Issues that are not related to the organisation can affect the employees' motivation or well-being, for example their families or personal life (Juniper, 2010). Other externally imposed changes can have an impact on the business, for example business volatility has been proven to have a positive impact on the employee performance (Chiang et al., 2018).

national and societal culture of the country affects organizational culture (Hofstede, 2011)

<u>Training</u>

Training can be considered from two different perspectives. Either as an initiative for experienced employees to obtain new capabilities and skills (Keeping and Levy, 2000; Brown & Benson, 2003), or as support for employees who are not up to expected level and need support (Erdogan, 2002). Such training can be considered as a way to create paths for the employees to enhance their skills and help their self-development (Muchinsky, 2006).

<u>Employee engagement</u>

Employee engagement is defined as the level of commitment and involvement an employee has towards the organisation and its values (Anitha, 2014). When an employee is engaged, he is aware of his responsibility in the business goals and motivates his colleagues alongside, for achieving the organisational goals. The positive attitude of the employee with his workplace and its value system is otherwise called as the positive emotional connection of an employee towards his/her work. Engaged employees go beyond the call of duty to perform their role in excellence Anitha (2014) (figure 3-8).

Figure 3-8 Employee engagement factors (based on Anitha, 2014))

<u>Reward System</u>

Rewards has been used for long time to acknowledge the performance of employees. Bonuses and monetary rewards that are awarded to employees who exhibit high levels of performance or solve complex issues, generating extra value for the organisation. For this however to work, Salau et al. (2014) highlight the need for clearly defining the role of the employee within the organization.

<u>Workplace Conditions</u>

The state of the workplace and the conditions are usually highly regulated. These are requirements, terms of a job as well as the environmental characteristics that are needed for the employee to be able to perform his work in a satisfactory manner, as this is perceived by him. In many countries, there is a minimum set of working conditions that are required by law and the organizations need to provide to their employees.

<u>Career Development</u>

In a number of studies (indicatively Cook and Crossman (2004), Caruth and Humphreys (2008), Prowse and Prowse (2009), Macey et al. (2009)) it was highlighted that that employees get motivated to work when they get frequent promotions after appraisal system in their work place.

<u>Social exchanges</u>

Social exchanges refer to the informal social interactions that the employees establish among themselves but they might also be promoted by the managers within the organization. The process of social exchange is initiated by organisations once the minimum expectance with regards the way an organisation values employees' general contributions and cares for their wellbeing is achieved (Eisenberger et al., 1990). Once employees' feel and experience that organisations value and deal equitably with them, they will reciprocate these "good deeds" with positive work attitudes and behaviours (Aryee et al., 2002). In social exchange, all stakeholders in an organization must somehow persuade the other of their trustworthiness (Haas and Deseran, 1981).

Well-being programmes and activities

In order for the wellbeing of the employees to be improved and maintained, organizations offer activities to the employees in order to help them sustain an appropriate lifestyle and well-being. Such activities can include fitness challenges (for example through sponsoring gym memberships), develop areas for socialization, healthier meal options in the canteen, instituting flexible work hours, enhanced paternity / maternity leaves to list few. The papers reviewed in the literature review indicated the positive impact that such activities and programmes have in the employee performance.

Work-life balance

Work-life balance can be defined as the need to "balance work and leisure/family activities" (Bratton and Gold, 2003). This can have a great impact on the performance of the individuals. For example, requesting employees to work long hours can have a huge impact on the personal / family life. It is critical that organisations embrace the concept of work-life balance. If organisations were able to offer a range of different arrangements (i.e. flexible working arrangement as described in the following section) then it is likely that employees will be more motivated and engaged and thus performing better.

Flexible working arrangements

Flexible working arrangements refer to working patterns that are different to the existing one. They may include part time work, flexible starting and finishing hours, remote working or working from home as examples (Houston, 2005). Usually such arrangements come with no cost, and in some cases, it might actually reduce the working cost as there will not be any need for desk, electricity, heating etc.

De Menezes and Kelliher (2016) claim that flexible working arrangements can improve the job satisfaction and organisational commitment of their employees in the long term.

Flexible working arrangements working arrangements can be classified as formal or informal ones. Formal flexible working arrangements are established and are acceptable by an organization as they are available within the organization's policies. Informal flexible working arrangements are informally negotiated and agreed by employees and their line managers.

Formal arrangements have a greater impact in job satisfaction than in organisational commitment. Informal arrangements can have a direct impact on the motivation of the employees, since they create a feeling of "needing to give back". This feeling is towards the managers that allow the arrangements rather than the company itself, therefore the impact on motivation and not on organisational commitment.

3.5 Simulation of employee performance

3.5.1 Introduction

Greasley and Owen (2018) presented a review study on the modelling of people's behaviour focusing however on the discrete-event simulation method. After reviewing a large number of papers, they have identified five different classes of modelling: "modelling people's decisions", "modelling people's availability", "modelling people's task performance", "modelling people's arrivals", "modelling people's movement". However, such an approach focuses more on the operation side of a manufacturing system.

Human behaviour on the micro-level is determined by nonlinear, complex, and dynamic phenomena; this makes it very difficult for analytic methods to be used for simulation (Bock and Pickl, 2014). As Sterman (2000) indicates, system dynamics is appropriate for modelling dynamic systems with complex nonlinearities, delays, and feedback processes. The focus of the present study is the modelling of employee performance with system dynamics, and thus the following section will review the models presented on this subject till now.

3.5.2 System dynamics modelling

For identifying relevant literature that present studies of use of system dynamics for predicting the employee performance, a set of keywords were used, such as: "Simulat*", "System Dynamics", "Model*", "employee". A short number of publications was found, that will be presented in the following paragraphs. In the next paragraphs some of the most characteristic models found will be presented and discussed.

One of the first relevant papers is included in one of the first books on the subject authored by Sterman (2000), where he attempts to model and simulate the mental aspects of human beings. His example is on workload management and uses causal loop diagrams for establishing a reference model (figure 3-9). In the same book, which is full of examples, he is modelling using system dynamics how workforce quality and loyalty are influenced by perceived career opportunities and wages.
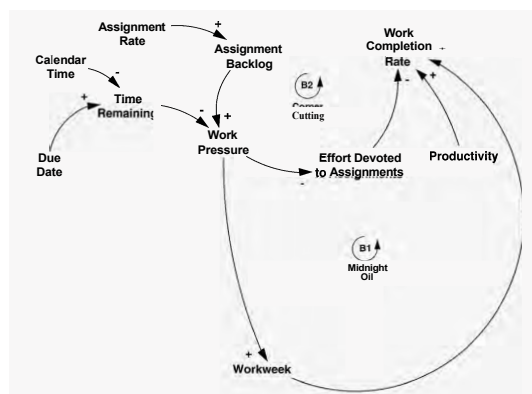
Figure 3-9 Basic CLD model for workload management (adopted from Sterman, 2010)

55

Akkerman and Kim van Oorschot (2005) presented a system dynamics model simulating the way employee's motivation, satisfaction, and training can influence productivity. They linked the use of a balanced score card with a system dynamics model in order to assess its feasibility for measuring the organization's performance. For modelling the employee's experience accumulation, they used stocks of new employees and experienced ones with the flow between the two stocks modelling the assimilation rate.
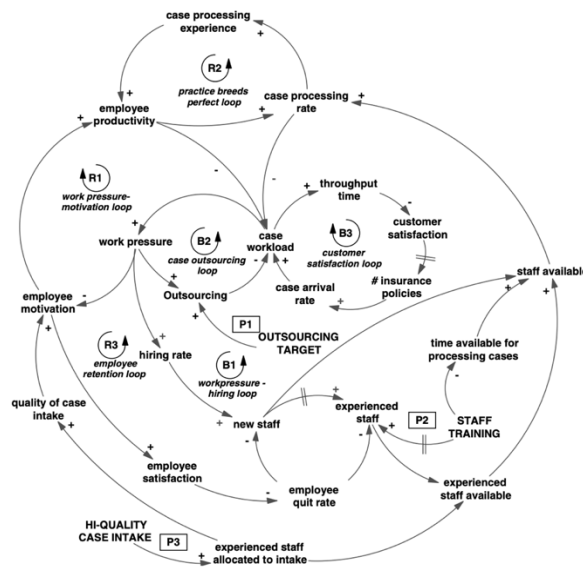

Figure 3-10 Basic CLD model for workload management (adopted from Sterman, 2010)

Gregoriades (2001), in one of the first published attempts, presented a system dynamics model to assess the impact of fatigue, motivation, and stress in human errors in a workplace environment. Jamil and Shaharanee (2017) in a similar study focused on how the human errors can be managed in power tool industries. They considered workload, job related stress and motivation theory in their study.

Kanaganayagam and Ogunlana (2008) presented a system dynamics model of workers' willingness to be employed in the construction industry, taking into account commitment to the organization, necessity of having a job, achievement, and job satisfaction respectively dissatisfaction.

Vancouver et al. (2010) used system dynamics to simulate the way new employees try to build up job relevant knowledge in a new organization. Jiang et

al. (2012) presented a system dynamics model for human performance modelling and training optimization. In their modelling approach they focused on the three of the key five factors that can have an impact on the effectiveness of training, namely Conscientiousness, Extroversion, and Openness. They did not consider Agreeableness and Neuroticism (Emotional Stability). The causal loop diagram as well as the associated stock and flow diagram are shown in figure 3-11.
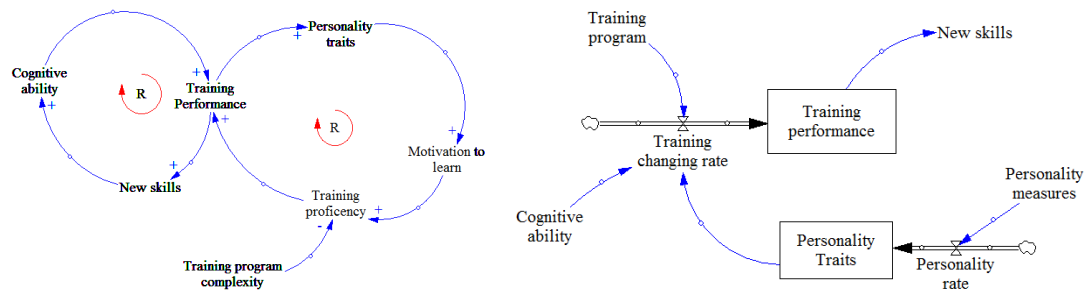

Figure 3-11 CLD and SFD model for the effectiveness of training (adopted from Jiang et al., 2012)

Shin et al. (2013) studied the decision-making process of a worker regarding safe behaviour including factors such as optimistic recovery or habituation.

Bock and Pickl (2014) presented a system dynamic model of individual's performance that is based on the AMO theory as this was outlined in a previous section. AMO theory is based on the assumption that people perform if they have the knowledge, skills and abilities as well as motivation and opportunity (figure 3-12).
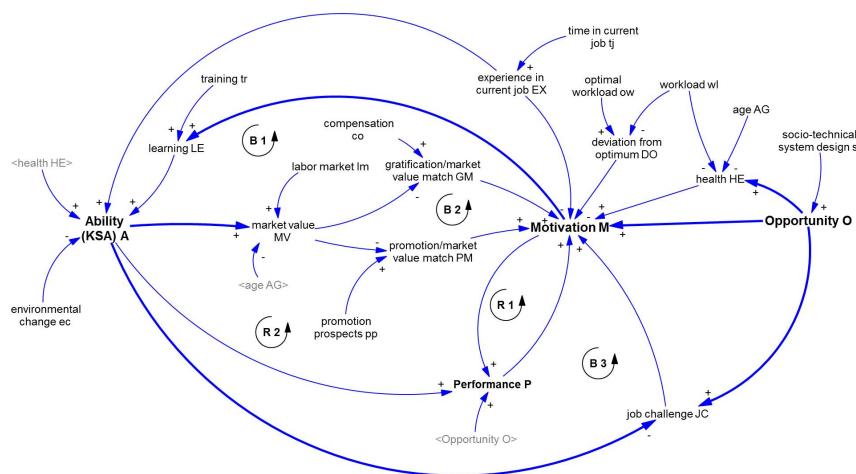
Figure 3-12 CLD model based on AMO theory (adopted from Bock and Pickl, 2014)

Wu et al. (2016) developed a system dynamics model for simulating the employee work-family conflict. They considered factors such as both the support and the pressure that employees experience from within the family, the workload, and job pressure, the support from the organization and the flexibility in their work environment (figure 3-13). The model was validated for the case of the construction sector. The simulation results highlighted that employees in this sector experience work interference with family conflict (WIFC) to a significantly greater degree than family interference with work conflict (FIWC). The model also indicated that improving work flexibility and organizational support can have a positive impact on employee satisfaction and performance from the perspective of work and family domains.
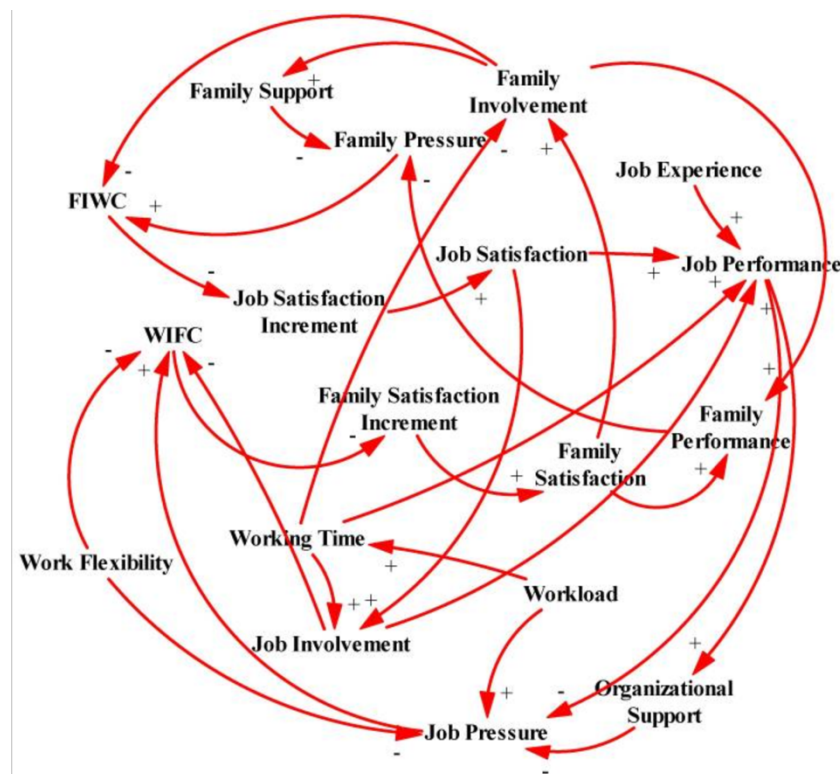
Figure 3-13 CLD model for simulating the employee work-family conflict (adopted from Wu et al., 2016))

Oleghe and Salonitis (2016; 2017; 2018a; 2018b; 2019) in a number of publications they have used system dynamics for modelling the impact of lean in manufacturing systems. They have developed models for assessing the level of leanness of manufacturing organizations (Oleghe and Salonitis, 2016), the

impact of implementing 5S (Oleghe and Salonitis, 2016) as a couple of examples. In a number of cases they have used system dynamics in parallel with discrete event simulation, focusing in the former in the organizations aspects of manufacturing companies and the latter for the operations of the processes and systems in the organization (Oleghe and Salonitis, 2018a; 2018b; 2019). In a recent study the focused on the use system dynamics modelling approach as a strategic planning tool for analysing business models (Oleghe et al., 2019).

3.6 Research gap

The literature review highlighted the following gaps:

- There is a lack of relevant studies on the employee performance within manufacturing sector in the United Arabic Emirates
- There is a lack of quantitative models for assessing the impact of various interventions within an organization for the improvement of the employee performance.
- Although a number of qualitative models exist, none of these can be used for the assessment of different scenarios and their impact on the employee performance.

3.7 Chapter Summary

The present chapter presented the literature review that is related to the current study. The chapter was structured as to be address the set of literature review questions that were set at the beginning of the chapter.

The chapter started with focusing on employee performance and the theories that have been developed over the years for explaining the employee performance and behaviour. The ways the employee performance can be assessed, and how to improve employee performance was discussed by reviewing studies htat have focused in these topics.

The factors that can have an impact on the employee performance were collected and discussed. In total 23 factors were identified after reviewing 140 papers. Each one of these factors were discussed.

Finally, models that have been developed and can used for simulation of the employee performance were discussed. The focus was mostly on models that have used system dynamics focusing on their assumptions and limitations as to decide the modelling approach to be adopted in the current research.

4 EMPLOYEE PERFORMANCE MANAGEMENT IN UAE

4.1 Introduction

In the present chapter, the development of the survey that corresponds to research objective two as well as the results are presented. Research objective 2 was aimed to "assess the current practices with regards employee performance in the UAE based manufacturing companies focusing in identifying (i) the methods used for employee performance assessment, (ii) the factors that affect employee performance, (iii) the ways adopted for improving employee performance and their efficiency". The literature review presented in chapter 3 highlighted as a research gap the lack of relevant investigations. For this reason, a questionnaire was developed based on the findings of the literature review, as to capture relevant information. This chapter presents the findings of this survey.
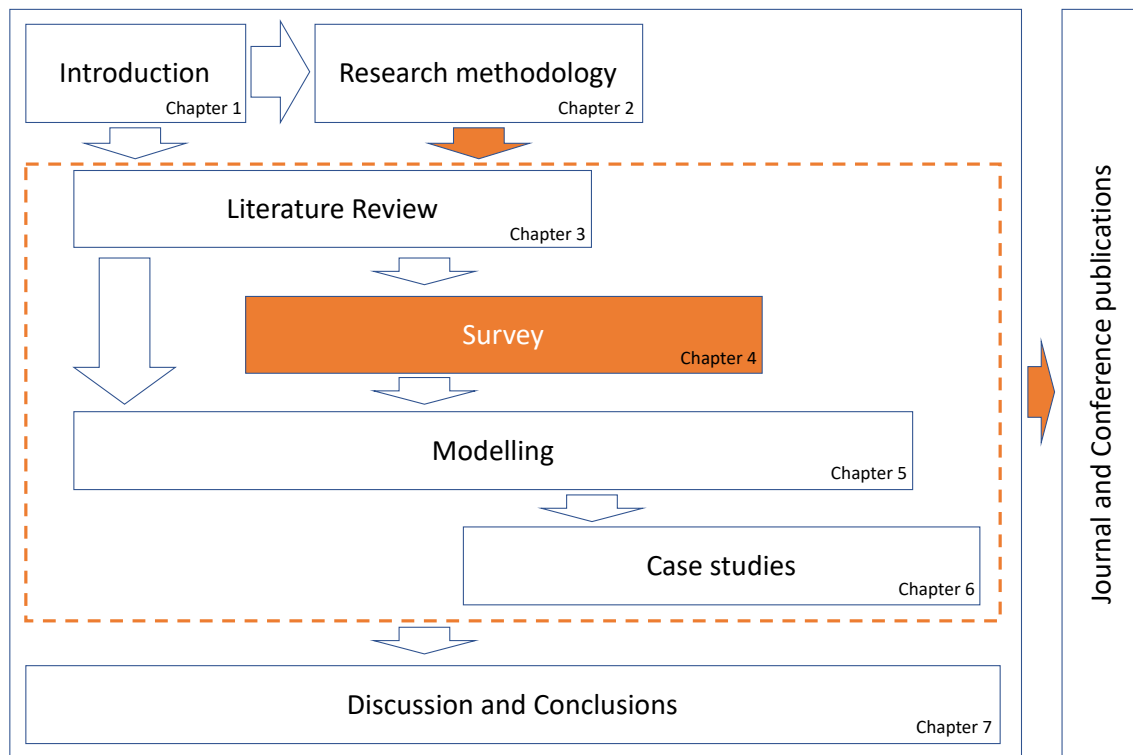
Figure 4-1 Chapter 4 within the whole thesis

Sections 4.2 describes the field study approach and how the questionnaires used were developed.

The questionnaire was approved by the Cranfield University Research Ethics Committee.

4.2 Industrial perspective of EP in UAE

4.2.1 Approach

As highlighted in the research methodology chapter, for achieving research objective 2, a survey is the most appropriate approach as it allows the capture of a large number of opinions.

In the whole duration of the study, three surveys were conducted. This was considered important in order for the analysis to allow to build the required understanding. Each survey was informed from the results of the previous one. The first survey was completed during December 2016, the second survey during spring 2017 and the last one during autumn 2017. All surveys was conducted after a pilot survey within Cranfield University was completed.

The key focus of the three surveys were:

1st survey: identify the relevant importance high-level factors when initiating an employee performance improvement programme in the context of UAE

2nd survey: identify the importance of the different leadership styles that are usually exhibited by managers and leaders in the UAE manufacturing companies

3rd survey: following the completion of the extensive literature review, assess the complete list of the factors affecting the employee performance and identify the possible relationships between them in order to build the causal loop diagrams for establishing the system dynamics simulation

4.2.2 1st survey questionnaire and results

4.2.2.1 Questionnaire

For the needs of the 1st survey, 75 manufacturing companies based in the UAE were contacted. Initially the aim of this survey was explained to the representatives of the companies, and 48 accepted to participate (64% response rate). The questionnaires were completed by the interviewer during a short

telephone semi-structured interview. The interviews were conducted during the first two weeks of December 2016.

The companies who accepted to participate in the survey are from several sectors including automotive, aerospace, defence, consumer goods etc. 20 companies of the 48 participating ones are SMEs (approximately 42%). The interviews were focused on the critical success factors as well as the barriers for the successful improvement of employee performance.

The questionnaire follows the regular format of similar questionnaires, and consists of three parts:

(1) the first one collects personal information of the interviewees,

(2) the second part collects general information of the interviewees' company,

(3) the third part assesses the critical success factors and the barriers when companies decide to implement employee performance improvement initiatives.

4.2.2.2 Importance of leadership in employee performance

Senior management commitment has been widely considered as a vital factor. The senior management commitment could be demonstrated in the form of developing clear vision ensuring sufficient financial resources, and providing strategic leadership.

Hamid's (2011) classified the critical factors, into the following categories:

- Top Management
- Training and education
- Thinking development
- Employees
- Working culture
- Communication
- Resources
- Business planning
- Customer focus
- Government intervention

The same classification was also used in the questionnaire, and the participants were asked to rank the factors in order of importance. Figure 4-2 presents the overall results, whereas figure 4-3 indicates the differences captured between SMEs and large organizations. It is obvious from the responses received that "top management" is critical for the introduction of lean manufacturing in both large organizations and SMEs.

The literature review also revealed the key barriers to implementing employee improvement initiatives. This can be grouped into "financial barriers", "employees related barriers", "top management related barriers" and "others". The "top management related barriers" that are of importance for the present study are related to the poor commitment due to several factors such as lack of understanding, poor knowledge, change inertia, lasting of commitment etc.

Figure 4-2 Critical success factors for improving employee performance

Critical success factors for improving employee performance
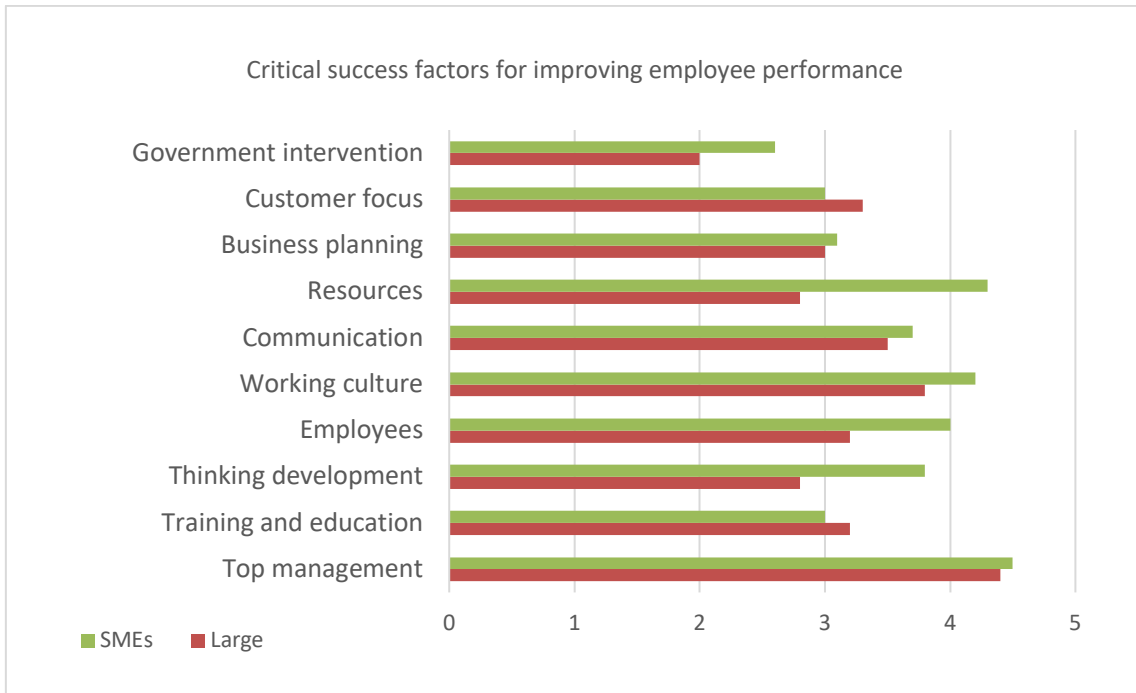
Figure 4-3 Critical success factors for improving employee performance (Large manufacturing companies and SMEs)

Based on the results, it is shown that one of the main causes in deploying continuous improvement projects for increasing employee performance is related to everyday problems occurring such as "Distractions, and/or slowdowns due to firefighting on other projects". In order of importance, "workforce related barriers" are the most critical ones with top management related ones coming second. However, for the case of SMEs the first in importance barriers were considered to be related to top management as it can be seen in figure 4-4. This is in agreement with previous studies in the UK (for example Achanga et al. (2006) indicated leadership as the key factor among finance, skills and culture).
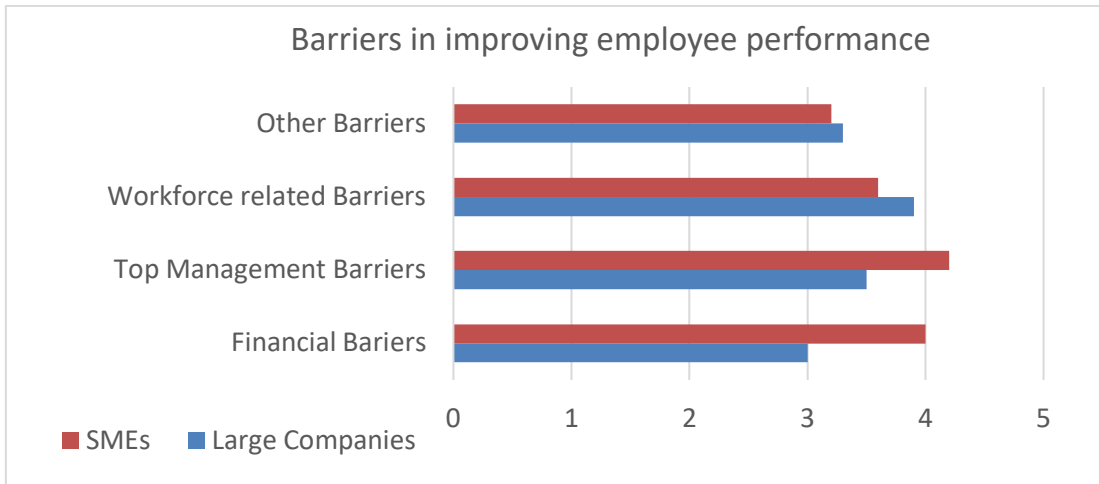
Figure 4-4 Generic classification of barriers

4.2.3 2nd survey questionnaire and results

The first survey revealed the importance of top management and leadership in the implementation of employee performance improvement initiatives. This highlighted the need for further investigation on the leadership style usually adopted in the UAE within the manufacturing sector. For this reason, and based on the literature review on the different leadership models, one was selected that covers the whole spectrum of styles, which was then the basis for semi-structured interviews to take place.

4.2.3.1 Leadership style

As mentioned in the literature review chapter, there is a large number of leadership models available. It was decided in the present study to use Hersey and Blanchard (1969) situational leadership theory as it is based on the assumption that there is no best style of leadership, and its situation required a different style in order to get the optimum results. The situational leadership theory characterizes the leadership style in terms of the amount of task behaviour and relationship behaviour that the leaders provide to their followers (or in the context of the present work, the employees). The four styles that can be used independently are the telling (or directing), the coaching, the supporting and the delegating one (figure 4-5).
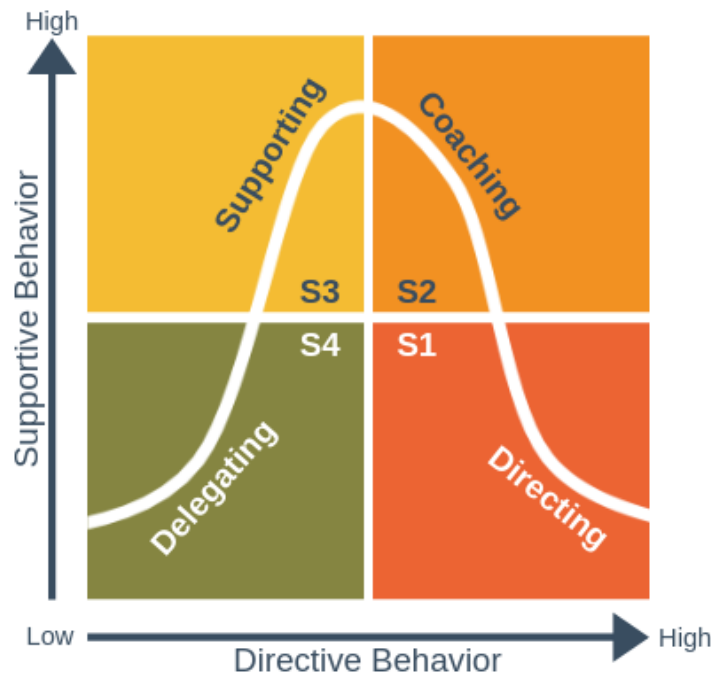
Figure 4-5 Hersey and Blanchard (1969) situational leadership theory

Telling (or directing) is based on the concept that managers give precise instructions and orders about what to do to their employees. In such situation, the leader will make all the decisions without consulting subordinates. They will inform their team of their decision they have made and expect their team to carry out their instructions. Usually such a style does not give the chance for the team to feedback. In other theories, such a style is characterized as autocratic leadership.

Coaching leadership style still relies on managers directing employees on what to do, but at the same time they engage more with them and explain and teach them how to do their tasks. This allows the employees to feed back to their managers and they on the other hand are more receptive. The requirement for manager to teach the employee results in increased time requirements from the managers. In other theories, this style is closely related to the democratic style of leadership.

The supporting leader will participate in idea creation and decision making, but most of the decisions will be taken by the team as a whole. Supporting relies on

the independence of the employees. Managers are available for the employees to ask for support when and if needed. Most of the time the help required is related to resources and organisation rather than task direction. This type of leader appear to be "quiet" because they lead by example and appear to be an equal team member of the team, rather than it's ruler.

Delegating completely gives the task responsibilities to the employees, and managers only review the results. They provide minimal direction and guidance. It is a hands-off style of leadership similar to laissez-faire leadership where the group makes almost all of the decisions. This type of leader is usually concerned more with communicating their vision of the future than directing the day-to-day. It relies on employees being highly qualified, which frequently means extra expenses in salaries.

The questionnaire was circulated among the employees of 35 SME manufacturing companies in the UAE, asking the respondents to select between the four leadership styles and their perception on whether the style had a positive or a negative impact to their performance. The respondents could select more than one leadership style and indicate the percentage of managers that uses this style. Furthermore, for the companies that at least 5 employees responded, interviews were conducted with medium and senior managers in order to capture the management perception as well.
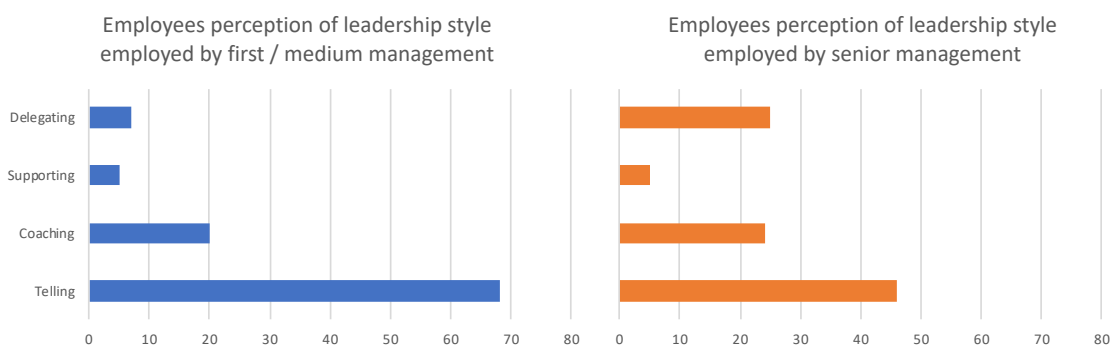
Figure 4-6 Employees perception of the type of leadership employed by management
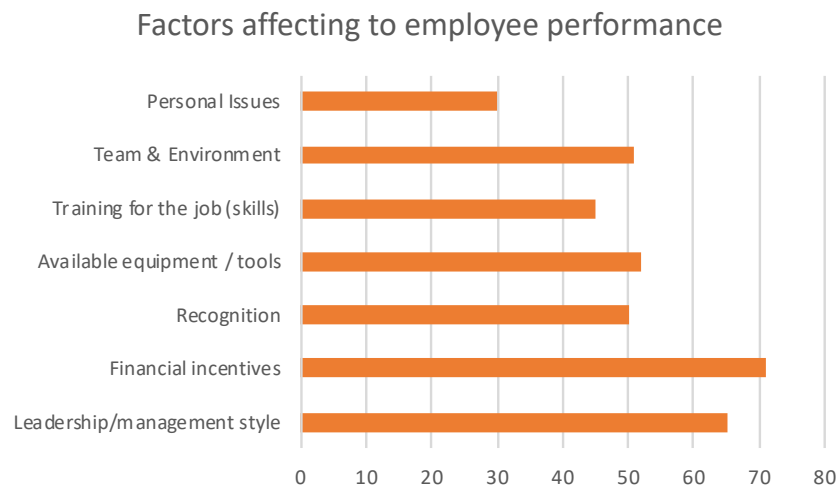
Figure 4-7 Factors affecting employee performance

As shown in figure 4-6, the most prominent leadership style used in the SMEs as perceived by the employees is the "telling" one. In almost 90% of the companies, that was the case. Furthermore, since the employees were asked to indicate if there is a difference between the leadership/management style between their direct line managers and the senior management, it can be seen that when asked for the senior management, employees had a slightly different perception and indicated that "delegating" style is important as well. With regards the impact of the style on their performance, they consider it important, although financial incentives seem to be even more important (fig. 4-6), this is in contrast to other studies in developed countries where the "recognition" ranks first. Finally, for one of the companies in figure 4-8, it can be seen that employees' perception does not coincide with that of the managers. Managers believe that their leadership style is more of the coaching and supporting style, when workers have a different opinion and receive their style more as telling.
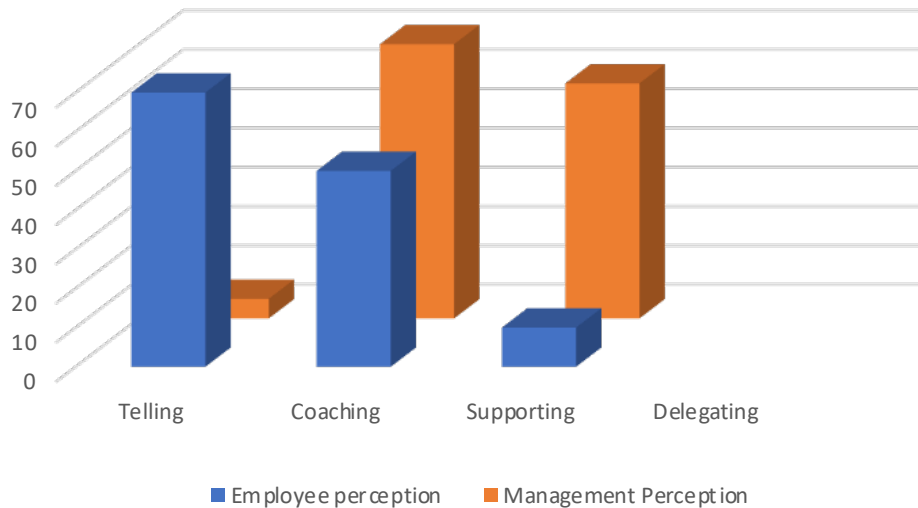
Figure 4-8 Difference of perception of leadership style employed by management in company A

4.2.4 3rd Survey questionnaire and results

4.2.4.1 Factors affecting the employee performance

The literature review in the previous chapter revealed 21 factors affecting the employee performance that are mostly referred to in the literature (Table 3-2). These factors are:

- Motivation
- Employee well-being
- Work recognition
- Human Resource practices
- Learning
- Job satisfaction
- Leadership style
- Organization commitment
- Absenteeism
- Justice - Equal effort
- Training

- Organizational culture
- Employee engagement
- Reward system
- Workplace conditions
- Career development
- Social exchanges
- Well-being programmes
- Work - life balance
- Flexible working arrangement
- External environment

As highlighted in chapter 2, these factors have been collected from studies that are not specific only to manufacturing organizations, or from specifically the middle east countries. Therefore, the third survey conducted focused in

70

understanding the importance of these in the context of UAE manufacturing sector.

Four organization participated in the survey (the ones that also agreed to participate as case studies as well). The questionnaire was in the form shown in figure 4-9 and figure 4-10 for a selection of the factors. The basis for designing the questionnaire was the questionnaire presented by Elding (2005).

Please mark from 1 to 5 how satisfied you are with the following aspects of your work: *(with 1 being "not satisfied at all", 3 being "neutral" and 5 being "extremely satisfied).*						
1. Pay rate		1	2	3	4	5
2. Working conditions		1	2	3	4	5
3. Other benefits		1	2	3	4	5
4. Working hours		1	2	3	4	5
…						

Figure 4-9 Extract from the 3rd questionnaire

Please mark from 1 to 5 your overall levels of: *(with 1 being "not satisfied at all", 3 being "neutral" and 5 being "extremely satisfied).*						
1. Satisfaction with your job		1	2	3	4	5
2. Motivation in your job		1	2	3	4	5
3. Effort in your job		1	2	3	4	5

4. Performance in your job		1	2	3	4	5
…						

Figure 4-10 Extract from the 3rd questionnaire

Furthermore, the participants in the survey at the end were asked to identify any factors that they consider important and were not included in the questionnaire.

4.2.4.2 Results

Based on the responses to the questionnaire, the mean of the perceived importance of the various factors was revealed and shown in figure 4-11. The colour coding is the following:

- Blue: factors that are accepted as important (mean level above 4.0)
- Brown: factors that are less important (mean level between 3.5 and 3.9)
- Red: factors with a mean level of 3.0 to 3.4
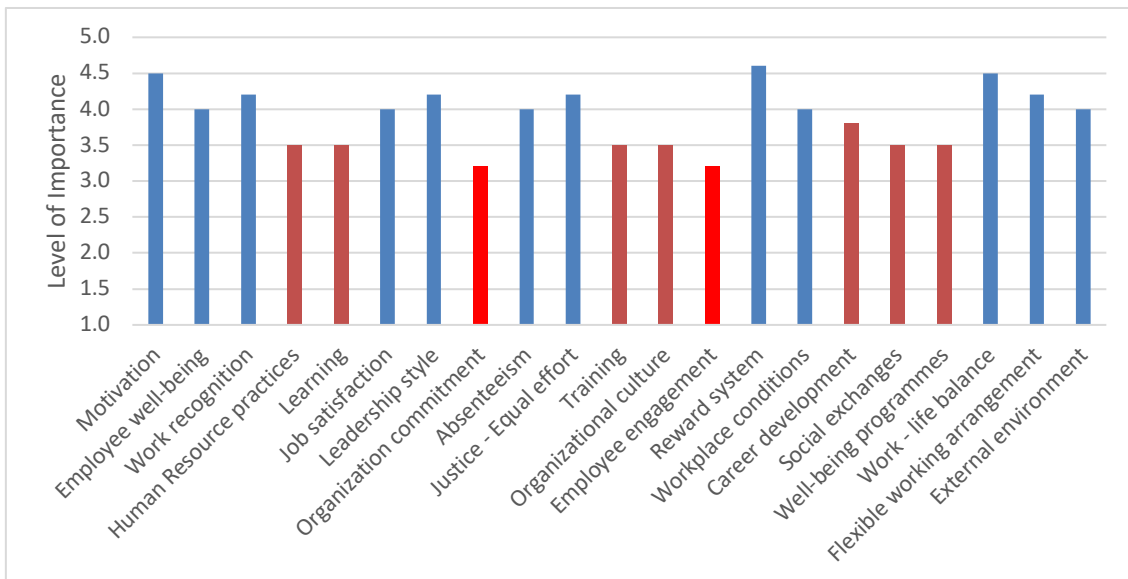
Figure 4-11 Importance of the various factors

Figure 4-11 highlights that the employees consider as very important the motivation means that are used in their companies, the reward system adopted by the company and the work life balance (all three factors with a mean over 4.5).

Other important factors are the employee well-being, the recognition that they receive by their organization, the job satisfaction, the leadership style, the absenteeism, the justice system in the organization, the workplace conditions, the flexible working arrangements and the external environment.

Human resource practices, learning, training, organization culture, chances for career development, social exchanges and well-being programmes were considered as being second to importance. Finally, organizational commitment and employee engagement were ranked as the least important.

The interviewees were asked to identify parameters that they consider as important and were not included in the initial list. These resulted in a second set of parameters, as found hereafter:

- Attention to detail – the employee performance is affected by the attention to detail that the employees are putting. This can be linked to the ability and skills of the employees.
- Adaptability - the speed with which the employees will reach an acceptable performance level and the ability to gain advantages after major organisational or departmental changes
- Change Agent - changes are put forward by the organisations in an attempt to improve operations and processes. Such changes require time from managers in order to identify or develop an employee who can be the role model and perform as a change agent
- Competition recruitment – the participants highlighted the impact that job offers from other companies can have on their performance. This was also supported by relevant literature (Anitha, 2014).
- Workload and Schedule Pressure. Workload and time pressure was highlighted by the participants as key factors affecting their performance. These two factors have been identified as well in the literature, indicatively Brüggen (2015) highlighted the negative correlation that intense workload can have on the performance of the employees that can lead to human errors. Murali et al. (2017), in similar sense, highlighted the impact that time / schedule pressure can have on the performance of the individuals.

- Overtime. The participants raised the issue of overtimes as a factor having impact on their performance. Their views however were mixed, on one hand request for excessive overtime will have a negative impact on the performance, but on the other hand

Furthermore, with regards incentives, a number of participants highlighted the need for segregation between monetary and non-monetary incentives. The improvement initiatives are the start of any performance change. They require resources to function (either monetary resources or non-monetary such as time) and represent where the company's focus on improving is.

Their focus is usually one of the main factors (i.e. reward system tries to increase motivation) or a secondary factor with a clear and direct impact on one of the main factor / performance.

During the interviews, the possible relationships between the various factors were discussed. All participants were given all factors in a paper and coloured pen to link the factors that they consider as interrelating. An example of such a response is shown in figure 4-12.
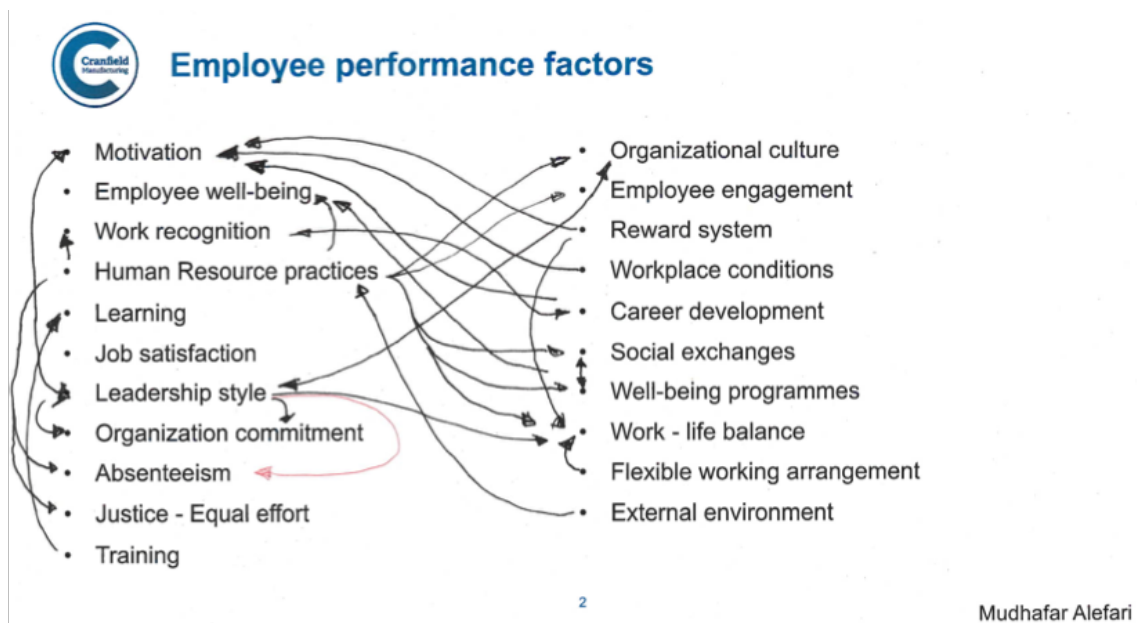
Figure 4-12 Data collection form during interviews

Further to the importance, the employees were asked to highlight the level of satisfaction with regards the factors that are employed by the organizations that they work for. Figure 4-13 presents the results of this analysis. The colour coding is the following:

- Blue: factors for which the employees feel that the organizations are using / applying satisfactory (mean level above 4.0)
- Brown: factors with a mean level between 3.5 and 3.9
- Red: factors with a mean level of 3.0 to 3.4
- Black: factors with a mean level of less than 2.9
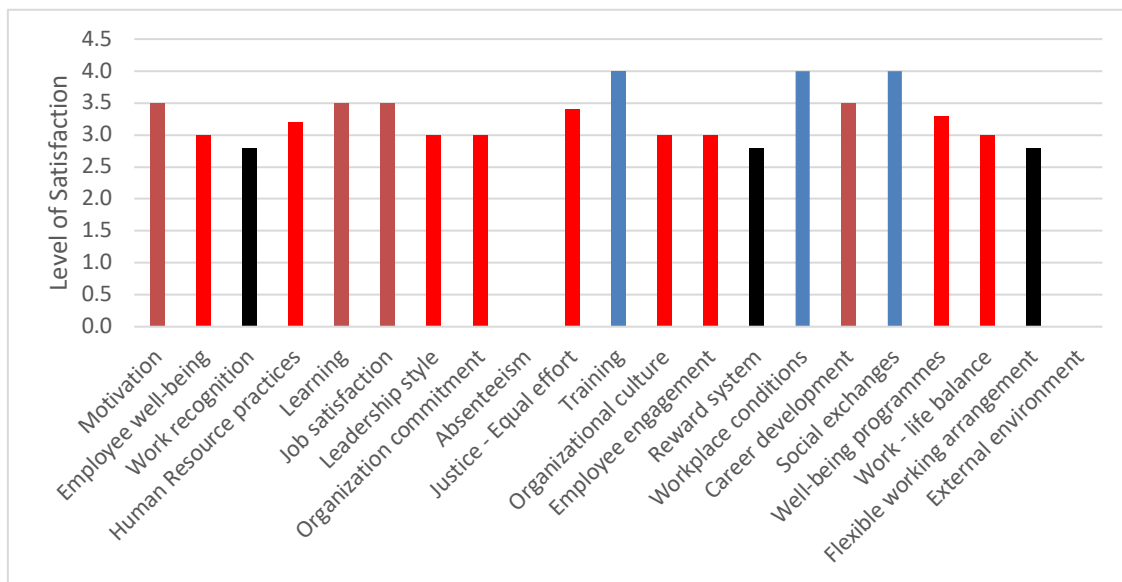
Figure 4-13 Satisfaction for the level of the various factors

As it can be seen in figure 4-13, employees are satisfied with the levels of training, workplace conditions and the social exchanges that they have among themselves. Motivation, learning, job satisfaction, career development are coming second in terms of the level of satisfaction they experience. Employee well-being, HR practices, Leadership style, organization commitment, Justice in the workplace, organizational culture, their engagement, well being programmes and work life balance were marked between 3.0 and 3.4. Finally the least satisfied factors were the work recognition, the reward system and the flexible working arrangements. They were not asked to rank the absenteeism and the

external environment factors, as these cannot be directly controlled by the organization.

4.3 Summary of the chapter

The chapter's aim was to assess the employee performance practices in manufacturing companies in the UAE. In order to capture and assess them maturity and compare to the literature review findings in other countries, a questionnaire was developed and circulated in manufacturing companies. The results of the third survey will allow the development of the system dynamics model in the following chapter.

5 SYSTEM DYNAMICS MODELLING OF EMPLOYEE PERFORMANCE

5.1 Introduction

In the present chapter, the development of the system dynamic model is presented. Research objective 3 was aimed to "develop a model based on system dynamics for the continuous improvement of the employee performance in the manufacturing companies". Based on the literature review presented in chapter 3 and the findings from the surveys presented in chapter 4, the causal loop diagrams are developed and then the stock and flow model. The present chapter presents the approach for developing the models and the verification of the results.
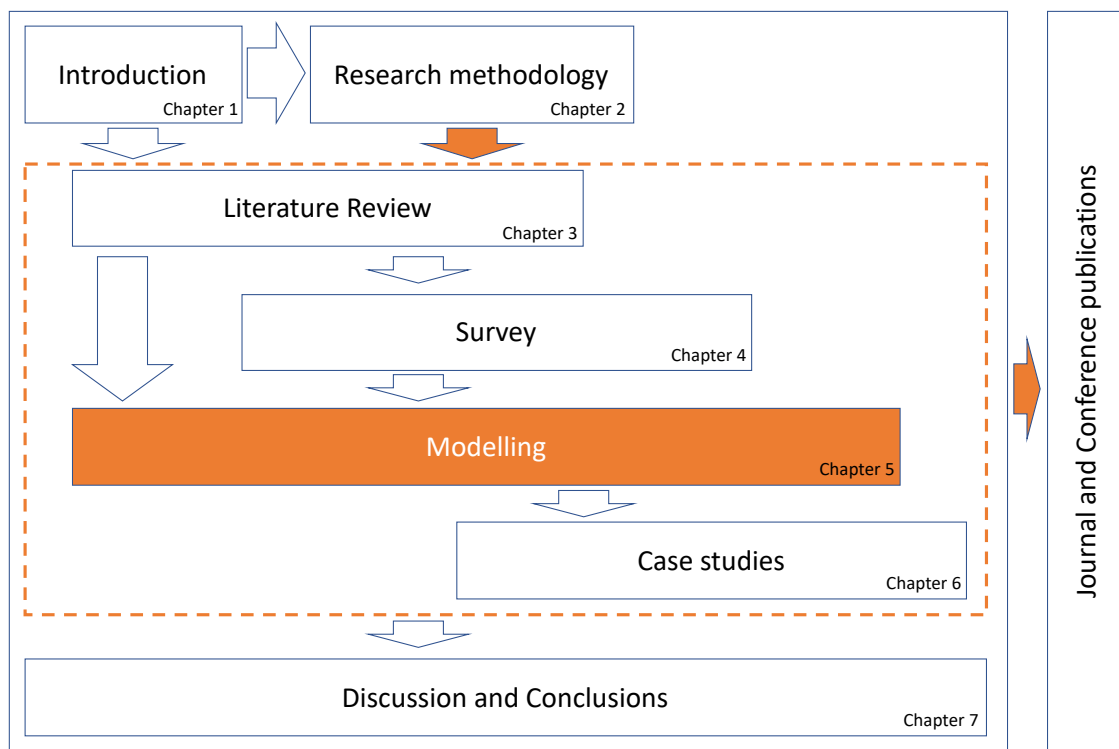
Figure 5-1 Chapter 5 within the whole thesis

5.2 Main hypothesis

Several different modelling and simulation methods have been developed, especially with the improvement of computation power, over the last few decades. The three most widely used simulation methods include (Robinson, 2004):

1. Discrete event simulation (DES),

2. Agent based simulation (AS), and

3. System Dynamics simulation (SD).

System Dynamics (SD) and Discrete event simulation (DES) methods are considered to be top-down approaches, thus focusing on the behaviour of the whole system. The agent-based simulation (AS) approach, on the other hand, is a bottom-up approach thus the model is focused on the behaviour of the individual objects. DES is focusing on the flow of various entities (such as material, work in progress etc.) and resource sharing of the process over time. SD on the other hand describes the system dynamical behaviour affected by integrated variables. AS allows the integration and cooperation between different modelling methods. Figure 5-2 shows different levels of abstraction in simulation models.
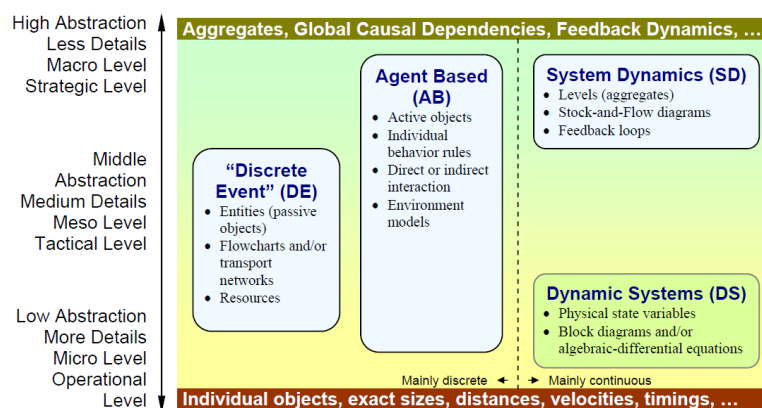
Figure 5-2 Different levels of abstraction in simulation tools (Borshchev and Filippov, 2004)

For the needs of the modelling of the present study, the System Dynamics modelling approach is more appropriate, as it assumes a high abstraction level, allowing to model types of behaviours (for example leadership style) and company policies (for example training, motivation etc.) and it focuses on the casual relationship of system variables and feedback loops (Sterman, 2000).

The examples presented in the literature review show that system dynamics can be successfully applied to model mental processes in a job context.

Forrester (1961) set the foundations and methodology of System Dynamics. He highlighted the need for dynamic modelling on how the organizations behave and grow. This is due to the deficiencies of the traditional modelling methods that are static and in most cases based on oversimplified replications of the system.

Growth and sustainable success must be understood dynamically. This is even more the case for the development of continuous improvement culture for the employee performance. Accordingly, the factors that contribute to the successful implementation can be analyzed, understood and explained only by dynamic models.

System's behaviour is the outcome of its structure. Complex systems consist of an interconnected structure of feedback loops. System Dynamics focuses on the causal relationship of system variables and feedback loops which could not be found in other modelling methods (Sterman, 2000). Therefore, the behavior of structured systems can be simulated in terms of their underlying feedback loops.

The feedback loop can be either positiv reinforcing) indicates that increasing one va variable and reduction in one variable can positive loops are shown in the graphs us correcting, balancing) refers to opposite ch 2014). In similar way such loops are showr 3 shows these two kinds of loops. Such a diagram is characterized as Causal Loop Diagram (CLD).
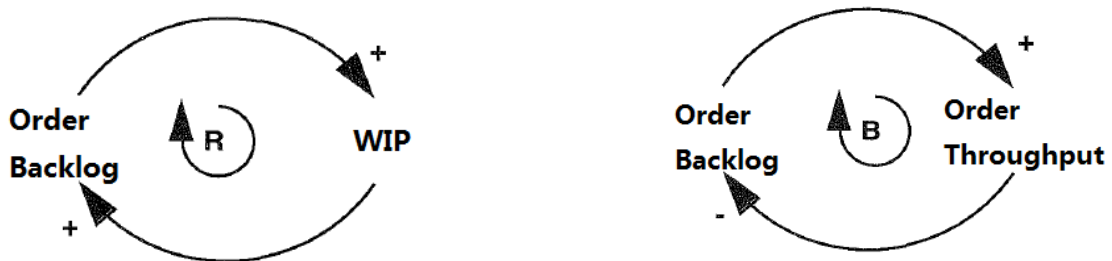

A system's feedback structure

Figure 5-3 CLD (left) typical positive and (right) negative feedback loop

A System Dynamics model has three basic elements, namely the stock element,

Structure: s and constants, which allow the system to

alter its behaviour with time and get feedback information from a cycle (Dangerfield, 2014). Figure 9 shows the notations of stock and flow.
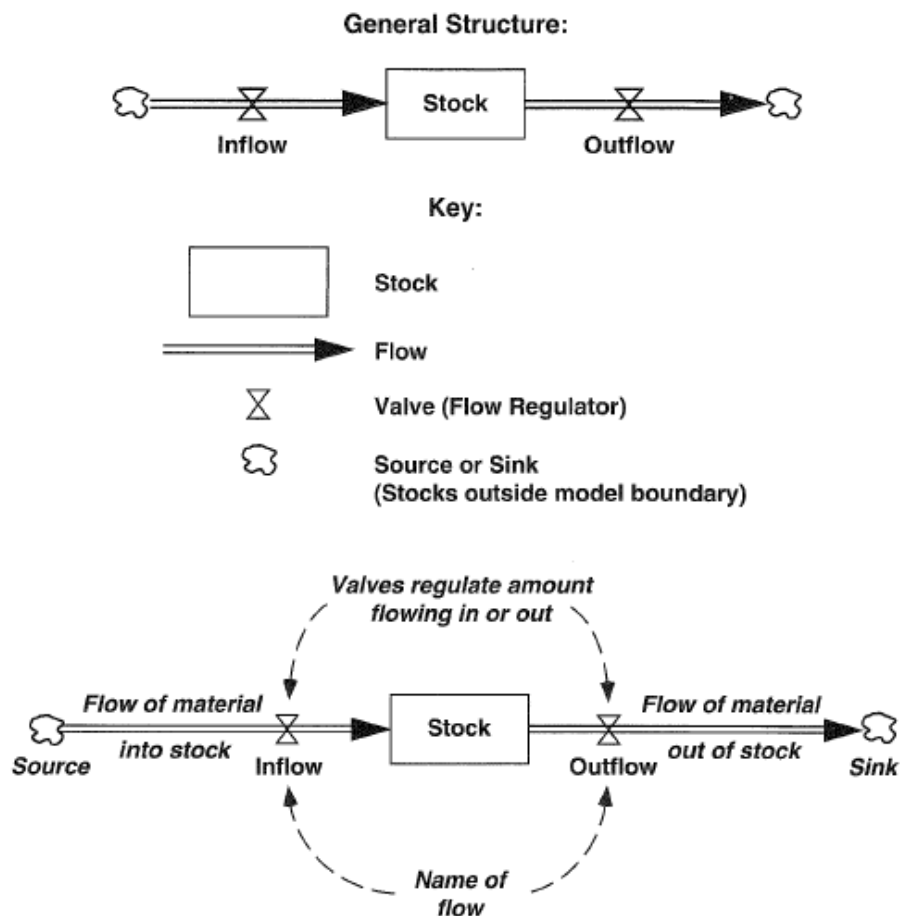

Figure 5-4 Stock and Flow Diagramming Notation (Sterman, 2000)

For developing an System Dynamics model, structured methodologies have been proposed (Sterman, 2000). Sterman proposed a five-step approach, with the steps being: "problem definition", "dynamic hypothesis developing", "simulation model building", "testing", "policy designing and evaluating". The iteration relation between the five steps and how they interact with the real world are shown in Figure 10. This approach will be followed for building the System Dynamics models for the present study.
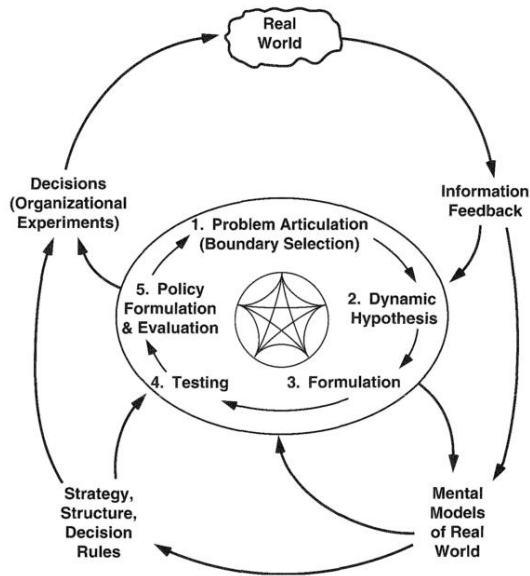
Figure 5-5 5 step approach for developing System Dynamics Models (Sterman, 2000)

5.3 System dynamics and employee performance

The starting point for modelling the employee performance is through building the CLD. This is done in a step by step approach adding complexity in every step. The parameters related are shown. A simplified version of the first attempt to model employee performance is thus depicted in figure 5-6.
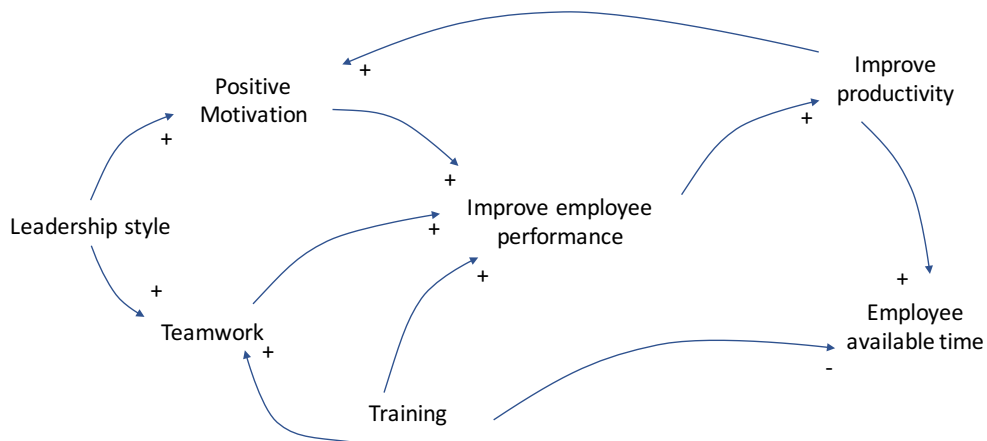

Figure 5-6 CLD for improving employee performance

Each arrow in the diagram is denoted by a plus or a minus sign. This indicates the impact of the changes between variables. For the case of a plus sign, if a

variable X that is linked to variable Y is increased, then variable Y will be increased as well. If the sign is the minus one, an increase of X will result in a decrease of Y.

A critical step on developing the model is on defining the formulas that describe the various causal relationships among the system variable. Such formulas can be developed based on theory, experiment, knowledge etc.

5.4 Approach for model development

5.4.1 Scope and Dynamic Hypotheses

Sterman (2000) presented the full systematic method for developing system dynamics models. He identified two critical steps at the initial stage of development:

- setting clear boundaries for the project scope
- defining clearly the dynamic hypothesis that will be the basis for the modelling and the data collection

Soedjono (2005) mentioned six criteria that can be used to measure the performance of an employee, these are:

- The quality of the work performed: the outcome of the work is near-perfect or meet expected goals set by the management;
- The quantity of the work: this is usually referred to as throughput in the manufacturing world, and refers to the number of products produced or the number of activities that can be completed;
- Timeliness of the work carried out: meeting the deadlines / schedules agreed with the management;
- Effectiveness of the completed tasks: the utilization of all available resources in the organization for achieving its goals;
- Autonomy of the individual: the ability of the employee to carry out work without assistance to avoid adverse outcomes; and
- Work commitment: Work commitment of the employees to the organization and

- responsibility of employees towards the organization.

Based on the literature review, the interviews conducted and the scope of the models to be developed, the basic dynamic hypothesis of the present study was set as follows:

- Employee performance can be measured as the quality and quantity of work that is delivered
- High performing employees generate resources (time and / or money) that the company can reinvest in other initiatives or save for future investments
- The effect of the initiatives and factors can be quantified as percentages

Given the human variability in behaviours and responses, there is not an accurate way of modelling the employees' response to each initiative, as each individual may respond in a different way.

5.4.2 Conceptual model

Based on the literature review, and the basic hypothesis set in the previous section, a set causal loop diagrams were developed for deciding on the form of the stock and flow diagram.

Based on the literature review and the 3rd survey, the factors were classified into main factors and secondary ones.

The main factors are selected as these that have a direct impact on employee performance. They are most likely the ones to have more connexions with other factors or initiatives than the secondary factors. In the context of the present work, the three main factors identified are:

- Employee well-being – as this is affected by almost all of the variables identified in the literature review.
- Motivation – similarly to the employee well-being, literature review highlighted the plethora of factors that affect the motivation of the employees.

- Abilities – as they have a great impact on the employee performance as highlighted by the AMO theory. One metric to assess abilities is for example the attention to details that employees are having..

All the rest of the critical factors identified in the literature review can be considered as secondary factors. Their impact on employee performance is usually through one or more of the main factors. However, for some of these there is also a direct effect on employee performance. These usually are more easily affected by the improvement initiatives and the main factors/performance changes.

The secondary included in the model, and described in the literature review are:

- Adaptability
- Learning
- Job Satisfaction
- Organisational Commitment
- Competition
- Flexible working arrangements
- Absenteeism
- Equal Effort

The factor "External Environment" was decided not to be included in the model as it cannot directly be controlled by the organization.

The model developed considers the improvement initiatives as key. For any performance change to be achieved, improvement initiatives and / or policy changes need to be implemented. The investment required by the organization for these to have a chance to be successful in most of the cases is money related. However, such investments have an indirect cost as well, due to the time required by the employees.

The aim of such improvement initiatives is usually one of the factors affecting the employee performance. It can focus directly a main factor or a secondary factor with a clear and direct impact on one of the main factors or the performance itself.

The time initiatives that were collected from the literature review and the 3rd survey are:

- Training
- Change Agent
- Schedule Pressure
- Overtime
- Well-being Activities

Similarly, the monetary initiatives are:

- Reward System
- Environmental Conditions
- Career Development
- Environmental Health
- Well-being Programmes

5.4.2.1 Basic Causal Loop Diagrams

The basic starting causal loop diagram is quite similar to the ones presented in previous studies (such as Appelbaum et al., (2000) and Bock and Pickl (2014)), however the interpretation and transformation to stock and flow diagram is different. In the present study, causal loop diagrams were developed using VENSIM software.

Figure 5-7 Basic causal loop diagram for the model

The opportunity for an employee to perform is related to the empowerment of the employee. It can be also considered as the opportunity to be involved in the decision-making process. This gives employees the sense of involvement,

engagement and enhances well-being. The literature review has already highlighted that this is related to the way the task / work is structured, thus it depends on the job design, the existence and operation of work teams, the feedback system and the sharing of information between the employees (Appelbaum et al., 2000). In figure 5-8, the opportunity sub-model is shown.
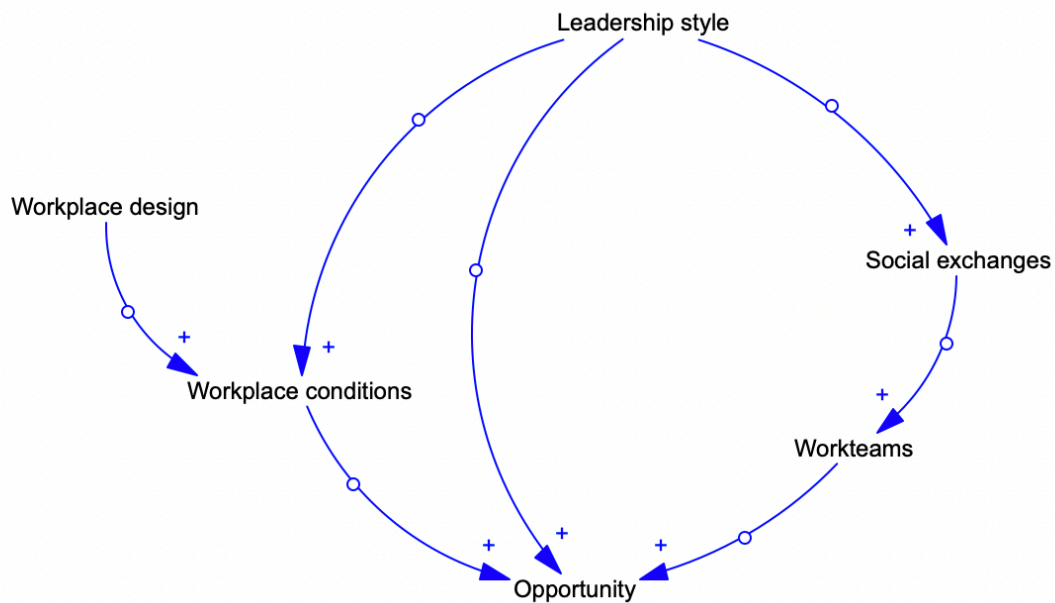

Figure 5-8 Opportunity sub-model for the model

The motivation sub model needs to address all the variables that can have either a positive or a negative impact. Furthermore, the impact of some variable might not be observable straight away and can potentially take some time. Keeping in mind Occam's Razor, (the simplest solution is almost always the best), and at the same time trying not to oversimplify and look information, the sub model developed is shown in figure 5-9. The basis of the sub model development was the literature review and the 3rd survey, as the example of figure 4-12.

The motivation of the employees depends on a number of variables. The rewards system, i.e. the various incentives and the basic salary of the employee impact on motivation. The rewards system is closely related as well with job satisfaction, the higher the salary, the higher the job satisfaction. Critical as well is the

organizational commitment. This affects the motivation of the employee, but at the same time is affected by a number of factors, such as job satisfaction, the way effort is recognized in the organization, the employee well-being, and the leadership style. The possibility of career development in the organization can also have an impact on the commitment of the employee and the motivation.

As can be seen in figure 5-9, some of the relationships there is a delay in their impact. As an example, improving the employee well-being will have a positive impact on the commitment that employees feel towards the organization, but this change requires time to be established.
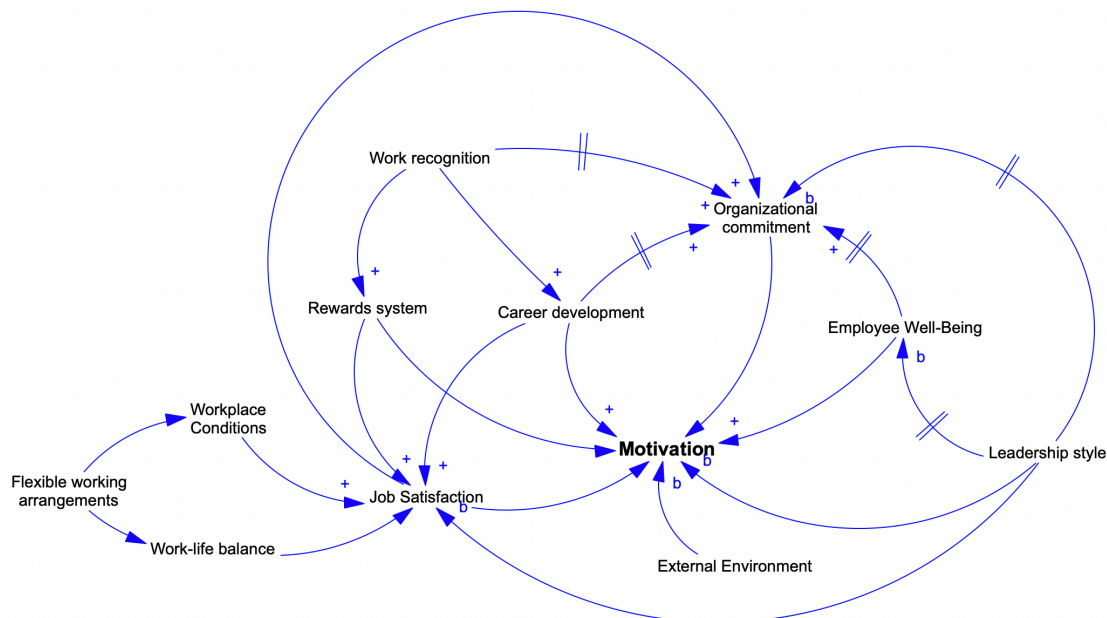
Figure 5-9 Motivation sub-model for the model

Finally, the "knowledge, skills, abilities" sub model is illustrated in figure 5-10. Knowledge and skills can be acquired through experience and learning. The learning can be either structured, through the participation in training courses or through the on-job practice. The time however spent (or some might say "invested") in training can increase the workload of the employee that can then reduce her / his ability to complete the task. The available time is central to the sub model. Schedule pressures can result in reduced time for training, can increase the workload, that then can potentially increase the absenteeism which again increases further the workload for the employees working. These factors

thus can have a negative impact on the ability of the employees to perform their work. As Bock and Pickl (2014) highlight though in their paper, knowledge, skills and abilities do not grow infinitely, but are subject to erosion.

In previous studies, the health of employees is considered as well. In the present study, this is considered through the well-being of the employees.
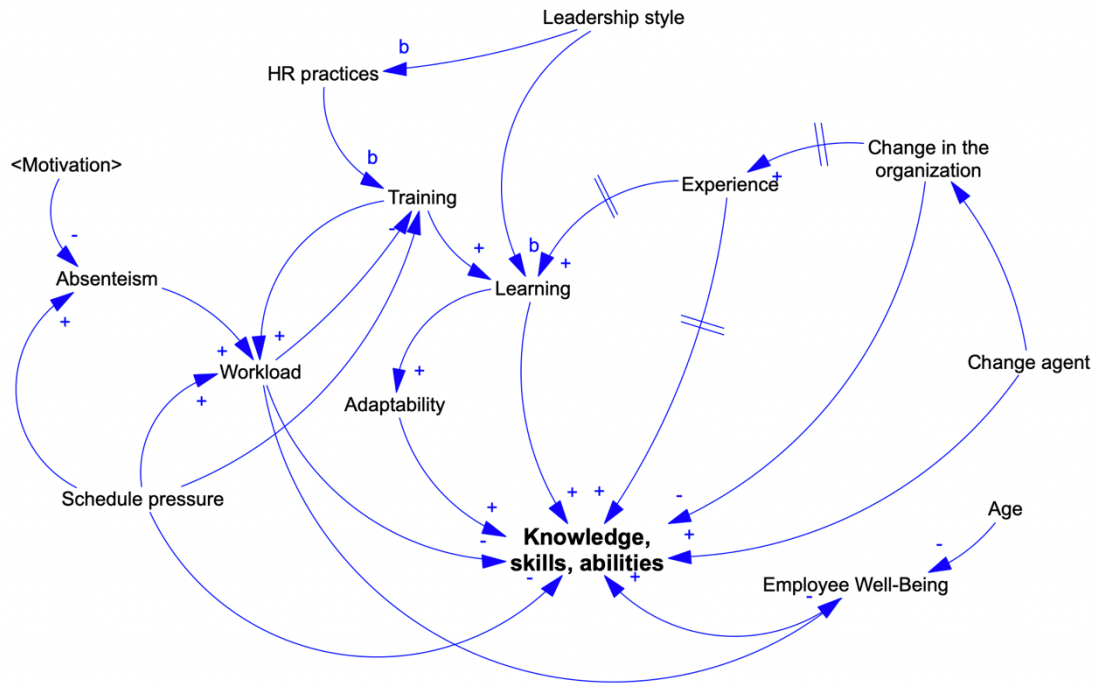

Figure 5-10 Knowledge, skills, abilities sub-model for the model

These three models do not stand in isolation. They relate to each other, in some cases the share factors as well. Locke and Latham, (2004) indicate that Opportunity has a direct impact on Motivation. Furthermore, Motivation indirectly has an impact on Knowledge, skills and abilities as well. Figure 5-11 presents the complete causal loop diagram.

A number of balancing and reinforcement loops can be identified. The complexity of the model is obvious. For the quantification of the model, a stock and flow diagram needs to be developed and will be presented in the next section.
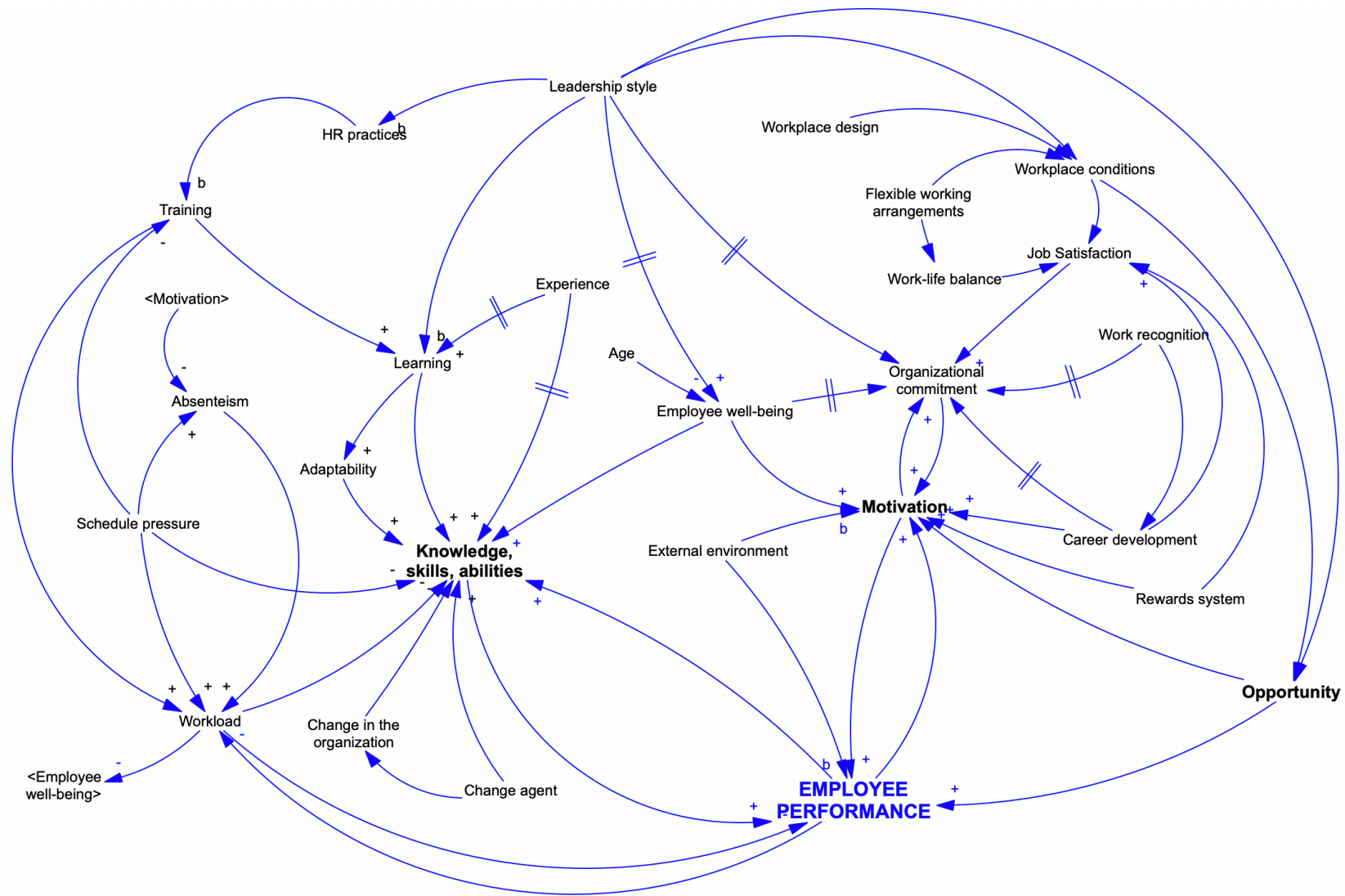
Figure 5-11 Causal loop diagram for the full model presenting the impact of variables to employee performance

5.4.3 Stock and flow model

Based on the causal loop diagram shown in figure 5-11, the key relationships were identified. For developing the stock and flow diagram, the basic stocks need to be identified. As the goal of this model is for an organization to be able to see the impact that various policies and changes can have on the performance of the employees, it was decided that the main stocks should be the number of low and high performing employees. In that case, the flow between the stocks will be defined by the various factors identified in the previous sections.

Figure 5-12 presents the stock and flow model developed. A number of parameters have been omitted from this graph for clarity purposes, however the causal loops between variables and stocks and flows are clearly shown. All variables have been included in the following detailed figures.
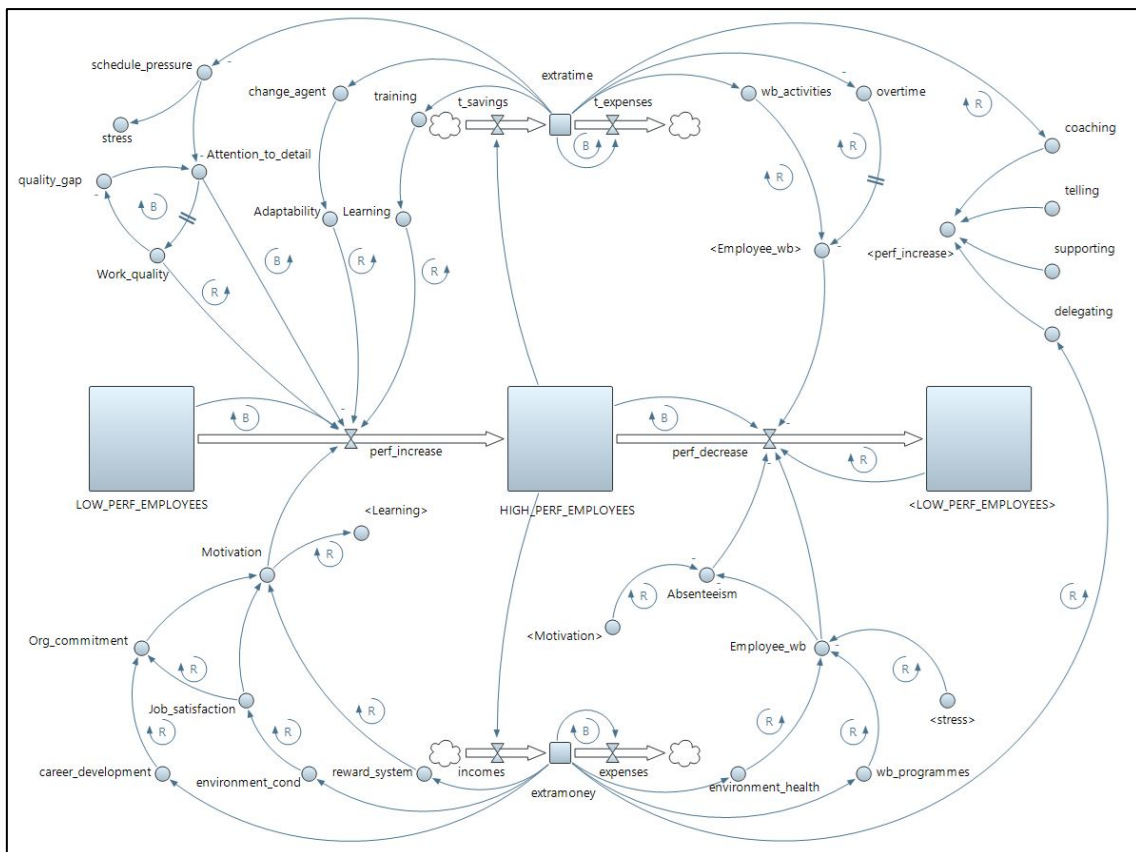

Figure 5-12 System Dynamics basic model

The basic elements of the model are the stock and flows of employees. In figure 5-12, smaller stocks and flows at the top and bottom are included that represent the resources (in the form of available time or money), from which the different initiatives are fed.

For managing the complexity during the development of the model, a number of "shadow" stocks were introduced, that can help link sub-models with the main model. The sub-models are presented in more detail in following paragraphs.
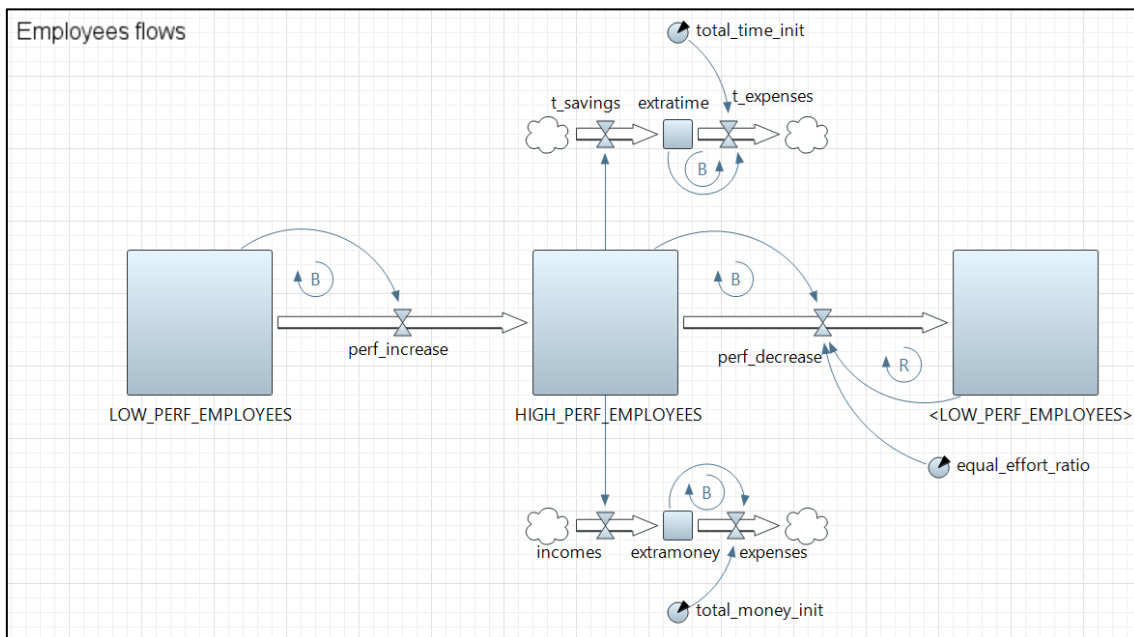

Figure 5-13 System Dynamics model employees

5.4.3.1 Employee Performance Flows

Figure 5-14 illustrates a detailed view of the stock and flows of the key model. One stock represents the high performing employees and one the low performing ones. The flow between the two stocks is determined by the initiatives and the impact they have on the performance.

As can be seen in the figure, there is a third stock of employees, which is a "shadow" stock for allowing clarity in the model.

The number of high performing employees impacts the inflow of the resources, as the high performers generate some value for the company. The focus of the project is to test the feasibility of maintaining the initiatives only with these

resources. Nevertheless, the inflow can also have fixed values or the resources stocks initial savings (both of them being investments made by the company).

The resources are expended depending on the active initiatives. The initiatives are activated by using on them a percentage of the existing resources, determined by the parameters associated to each initiative.

5.4.3.2 Leadership Styles

The four leadership styles from the situational leadership theory are considered in the model as well, using a sub-model.

As mentioned in the literature review, a style is never adopted independently, and usually the leadership style is a mix of the ones presented in the situational leadership theory. For this reason, each style can be activated or deactivated, and a percentage highlighting qualitatively how prominent the style is adopted is used.
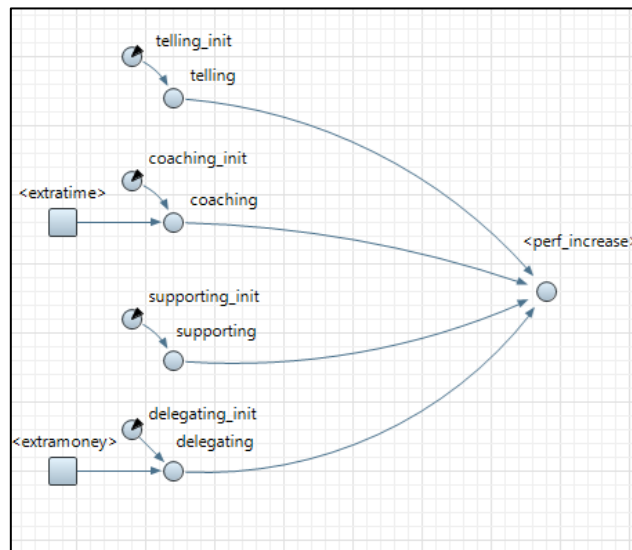

Figure 5-14 System Dynamics model leadership styles

5.4.3.3 Time Initiatives

In figure 5-15, the sub model of the time initiatives is shown. The model can accommodate a number of different initiatives, in figure 5-15 few of them are included such as the training, the use of a change agent, the setting of schedule pressure, the use of overtimes, and establishing well-being activities. Each of

these initiatives has a different impact on the various factors, and its effectiveness can be reported in the data collection phase. Parameters that represent the percentage of current resources used on each initiative are inputted in the model as well.
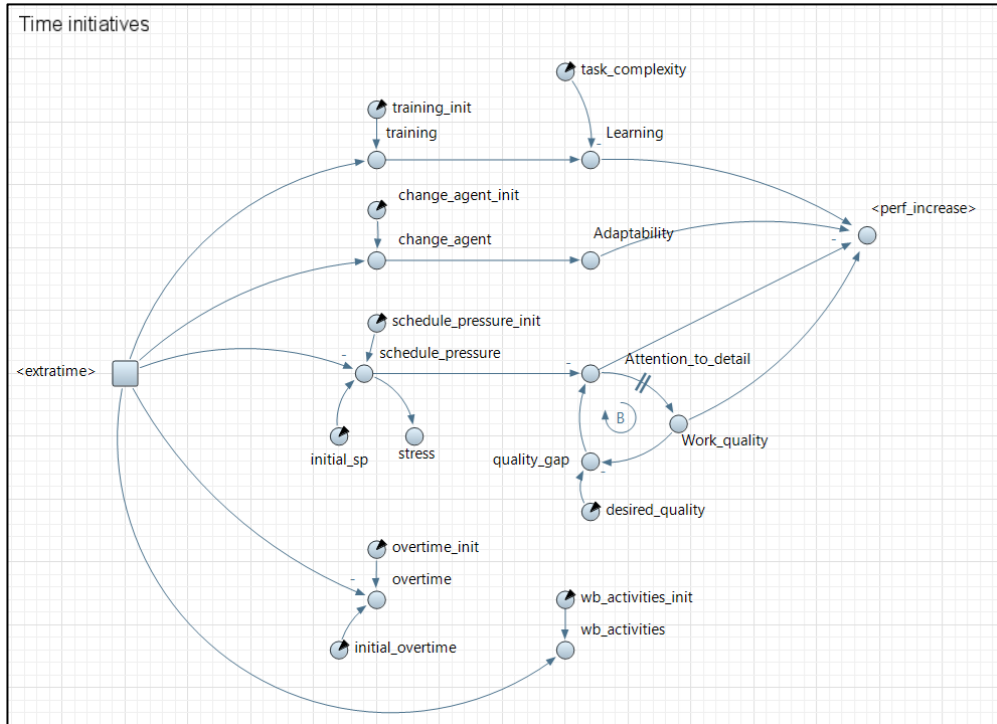

Figure 5-15 System Dynamics model time initiatives

The impact of each initiative in the various factors is calculated based on the length of duration that these initiatives are use. Additionally, the effect of task complexity, or the initial values of overtime, or schedule pressure determine the values of the factors. These have a cumulative effect on employee performance.

5.4.3.4 Money Initiatives

Figure 5-16 illustrates the sub model for initiatives that are based in money. A number of initiatives are shown in the figure, such as: rewards system in place, investments in improving the environmental conditions in the organization, the impact on the salary that a career development might have, the monetary impact of overtimes, or the money investment in well-being activities. Each initiative is a activated through a parameter that also indicates level of investment.
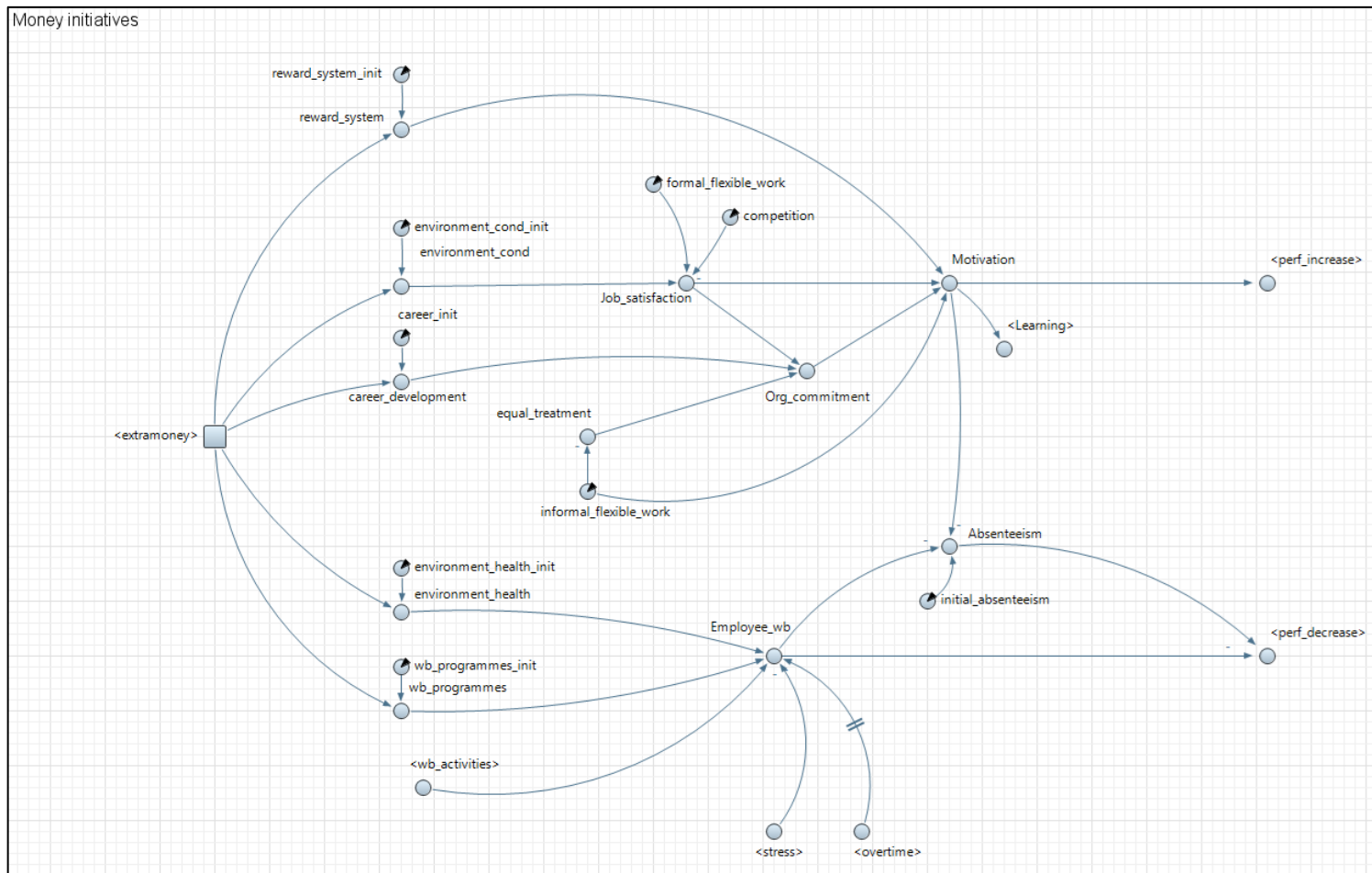
Figure 5-16. System Dynamics model money initiatives

5.5 Verification and validation of models

For accepting a model, it needs to be verified and validated. The simulation model is valid only if the model is an accurate representation of the actual system. Validation and verification are both required in any simulation project. The validation is the process of comparing two results. The representation of a conceptual model is compared to the real system. On the other hand, verification is the process of comparing two or more results to ensure its accuracy.

A number of verification and validation techniques are suggested in the literature[1]. Due to complexity of the problem, and the fact that some of the relationships are very difficult to be supported by real data, the verification of the models was based on comparing the results, and more specifically the predicted patterns, to the ones found in literature. The focus thus was to examine whether the model produces 'reasonable' results or not.

All variables and relations have been derived from literature and the surveys conducted. They were checked against literature within the fields of management science, organizational behaviour, and industrial psychology. Conceptual validity included a critical reflection of the model boundaries as well.

For verifying the results, a hypothetical organization that has 200 employees in total with 100 of them classified as high performers is considered. A number of scenarios were hypothesized in order to check the predictions of the model. The predictions were compared to what the literature suggests and were also presented to academics at Cranfield University with long industrial background who have served in senior management posts in the past. The simulations were run using Anylogic software.

- **1st scenario**: training sessions for low performing employees every 12 months

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[1] Adopted from
https://www.tutorialspoint.com/modelling_and_simulation/modelling_and_simulation_verification_validation.htm

The organization considered has decided to train the low performing employees every 12 months. The impact of this decision is shown in figure 5-17. Two different cases were considered, that affect the assumptions. The first case is that training is considered superficially by the employees and results in short improvements that however are not sustained. As can be seen in figure 5-17, the model predicts that the impact of the training on the employees is sustained for about 4-5 months and then it wears off, getting to a point that it lingers only to about 10% of the trained employees (10 employees). The other case is that the training is more substantial, and as a result it wears off with a slower pace. More employees retain their skills at the end of the year, indicating that the learning is profound. The second, and subsequent rounds, of training are more effective and the impact is cumulative. This simulation run support the findings of Jiang et al. (2012) about the effectiveness of training in organizations, and suggestions from Bock and Pickl (2014) about the short-term success when a singular managerial intervention is adopted such a training.
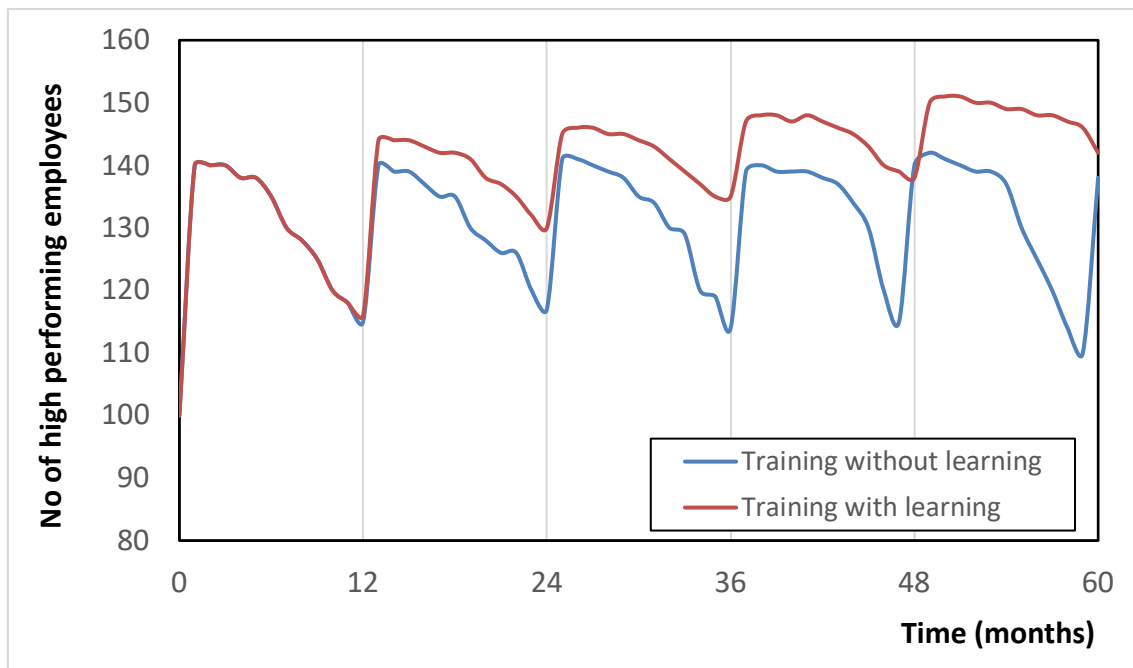

Figure 5-17 1st verification scenario

- **2nd scenario**: leadership style impact on employee performance

For the same hypothetical organization, the impact of changing leadership style was assessed. The initial assumption was that the organization in its current state sustains the number of high-performing employees when its leaders and managers adopt a mix of coaching and supporting leadership style. Four different simulation runs were then performed, where all parameters were kept steady with the exception the ones related to the style of leadership. The impact of these changes in leadership style are shown in figure 5-18.

The adoption of the telling leadership style seems to be a short-term success, as the number of high performing employees increases, but this success is not sustained. Furthermore, eventually this has a negative impact even to the employees who were initially performing.

Coaching leadership style relies on telling people what to do but at the same time teaching them how to do their tasks. It can lead to short term wins, however it requires a lot of time and energy from the managers that in the long run can have an impact on the performance of the employees as it does not allow them to grow independently.

In the case of supporting leadership style, the independence of the employees is critical. This requires some effort from the managers at the beginning but the model predicts an overall increase in the performance.

Finally the delegating style requires that managers completely give the task responsibilities to the employees, and managers only review the results. However, it requires highly qualified employees in order for such a style to be adopted. For this reason, the pre-existing knowledge and skills of the employees will define how successful such a style will be. When combined with training opportunities for the employees can have a great impact on the both the individuals' and the organizational performance.

Such a predictions are in agreement with what was revealed from the literature review with regards the impact of leadership styles (transformational vs. transactional, authentic, servant leadership, ethical etc.) (Saleem et al., 2019),

(Kundu et al., 2019), (Kia et al., 2019), (Otero-Neira et al., 2016), (Ribeiro et al., 2018), (Sihombing et al., 2018).
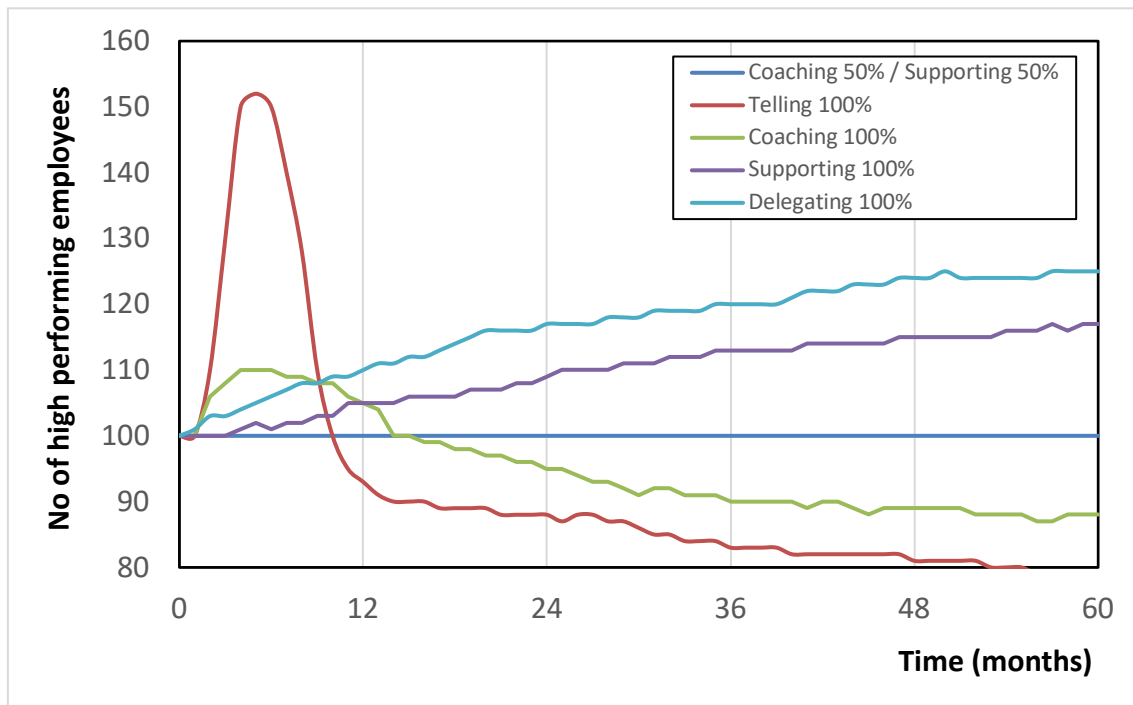

Figure 5-18 2nd verification scenario (blue line is the reference line / baseline)

- **3rd scenario**: Using monetary incentives for increasing employees' performance

For the same hypothetical organization, the impact of using monetary incentives, such as bonuses, paid holidays, paid registrations etc. on the employee performance was assessed. As expected (figure 5-19), when setting up such incentives the performance of the employees increases dramatically, however the impact of such incentives is not sustained unless these are repeated frequently. The model predicted an almost 40% increase in the number of high performers within just 5 to 6 months, but the impact of that change disappears after about two and half years. The downside of such an approach is that, once such incentives are used, employees tend to expect them and in the long run can have a negative impact on the overall performance, unless repeated. This was

obvious from the predictions of the model, as after five years the number of high performers drop by about 15% from 100 high performers down to 85.

Such behaviour is in agreement with previous findings from the literature (Kahn and Sherer, 1990), Anik et al. (2013).
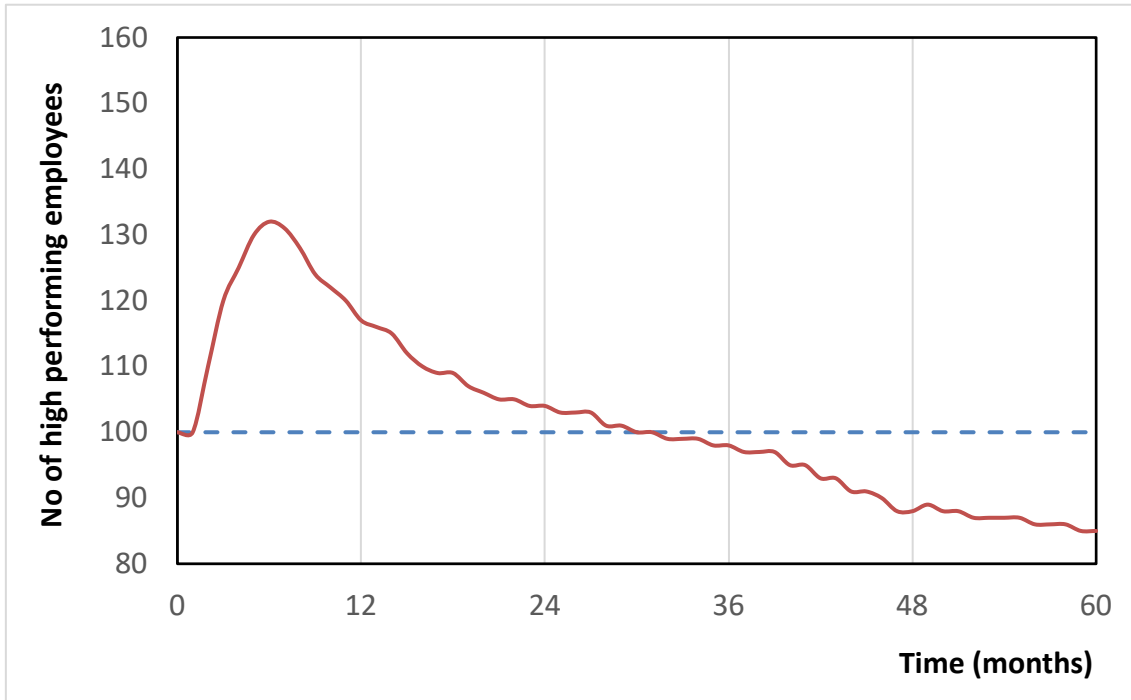

Figure 5-19 3rd verification scenario

- **4th scenario**: Introduction of well-being programme and activities

For the last hypothetical case, the organization's management decided to introduce well-being programmes and activities. Such a change has a long-lasting impact as can be seen in figure 5-20. There is high rate acceptance during the first year. As the enthusiasm of the new programme fades away, the impact is reduced, however there is an overall steady increase in high performers of about 15% lasting.
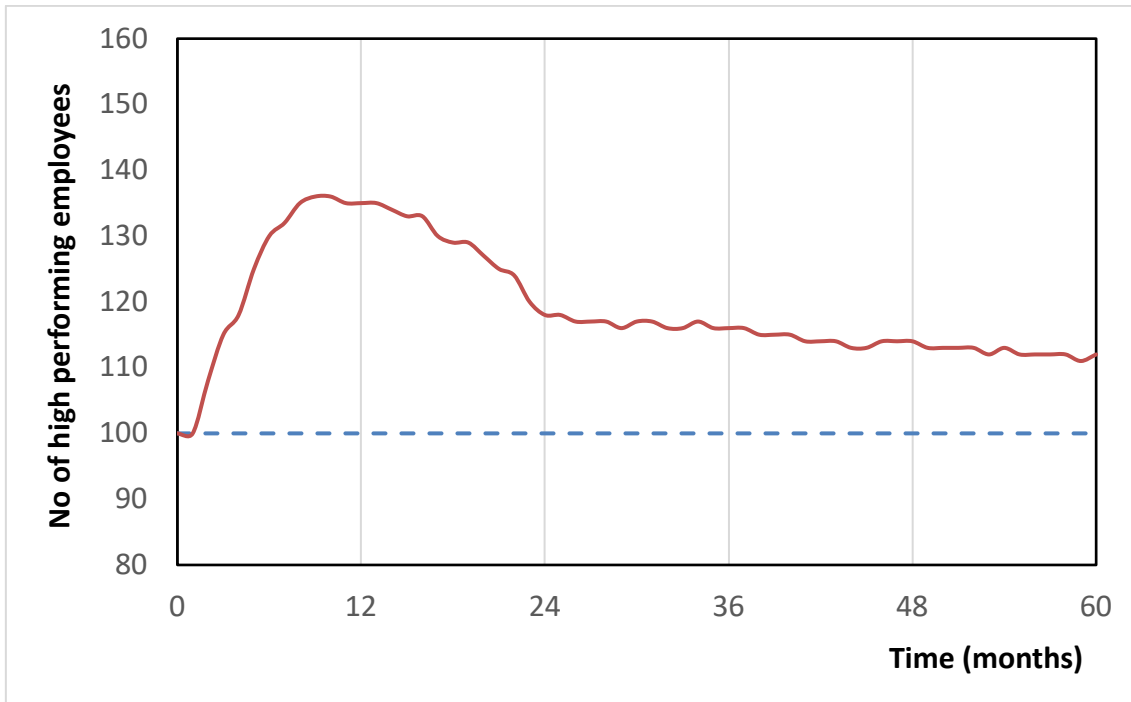
Figure 5-20 4ᵗʰ verification scenario

5.6 Summary of the chapter

The chapter's aim was to present the development of a system dynamics model of the factors that can improve the performance of employees. The model was conceptualized as set of causal loop diagrams, that were then transferred to a stock and flow diagram for the computerized simulation.

A number of hypothetical cases were run in order to assess the feasibility of the predictions. These were compared to previous studies found during the literature review, and by discussion with academics at Cranfield with industrial experience. The results were considered to be realistic, and thus the model was verified.

6 CASE STUDIES

6.1 Introduction

In the present chapter, the case studies for the validation of the system dynamic model is presented that addresses research objective 4. The chapter stars with defining the way the data are going to be collected from the participating companies, and how these will be used for specifying the variables in the model. Then three different case studies are presented, from companies with different size and from different manufacturing sizes in UAE.
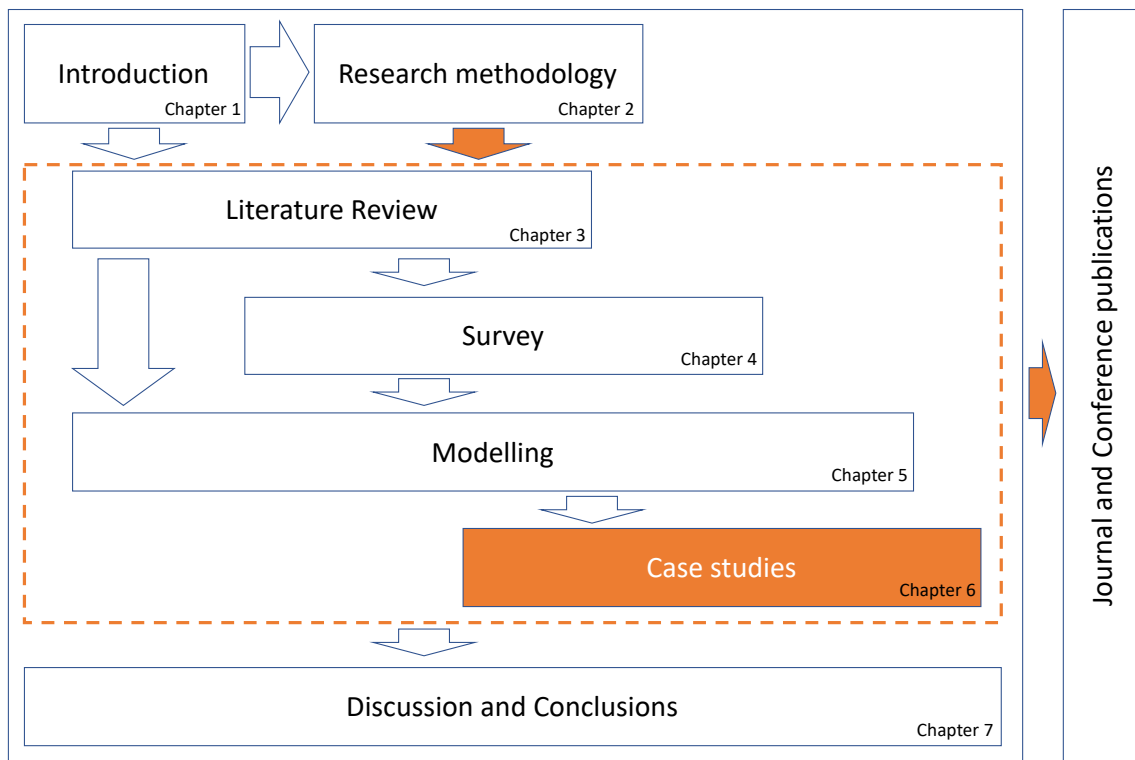

Figure 6-1 Chapter 6 within the whole thesis

6.2 Data collection protocol

Greasley and Owen (2018) noted that modelling method strategies can either be data driven to predict human behaviour or cognitive architectures to simulate human mental process. The approach in the present study is focused in collecting data from employees and managers. Greasley and Owen (2018) also identified as the major challenges when modelling people's behaviour, the

extensive data collection requirements and the difficulty of ensuring model validation. In the present subsection, the data collection protocol is presented.

Any model can be as reliable as the data that that are fed to it. Especially with regards models that attempting to simulate human behaviour, this can be even more challenging. Furthermore, for the system dynamics model to be able to predict the impact of different cases, the current state is important to be replicated as accurately as possible. This requires that any bias is controlled and taken into consideration as well as any specific perceptions need to be addressed in early in the data collection phase. For this reason, it is necessary that the various perceptions of both employees and managers are considered and addressed in the model.

For every case thus, it was decided to collect information from both employees and operators with the use of a questionnaire, and then collect data and rich information from managers by using a semi-structured interviews.

6.2.1 Data collection from employees - questionnaire

Employees responses to a questionnaire about work can vary a lot, even if some of them have the same background, position or experience. In order to make sure that the model captures as much as possible the employees perception, a questionnaire was developed and distributed to as many as possible employees in the organization.

For the participants to feel comfortable to participate in the survey and answer truthfully, the questionnaire clearly stated the terms with regards the anonymity of the responses. Gu and Nolan (2017) stated that the majority of employees believe that personal relationships can affect their performance appraisal, and this generates a negative mood.

The questionnaire developed is based on statements that the respondents need to state whether they agree or disagree and to what extent. Figure 6-2 presents an abstract of the questionnaire. The full questionnaire is attached in appendix A. The statements have been divided into categories according to which part of the model they provide information to.

STATEMENTS	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Leadership					
Being told exactly what I should do helps me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Having someone explaining my tasks and coaching me helps me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Working on my own but having someone available to support me helps me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Training & Learning					
Organisational training programs help me learn faster	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Figure 6-2 Questionnaire extract

Likert scale is used and thus each question is scored between 1 and 5. This scoring allows then the calculation of the various parameters included in the model that characterize the initiatives. Each question thus was related to one or more variables in the model. As an example, the response to the question "*Being told exactly what I should do helps me perform better*", will define the impact that the "telling" style of leadership will have on the performance of the employees. In a similar way, the answer to the question "*Organisational / Departmental changes help me perform better*" is related to the adaptability variable.

6.2.2 Data collection from managers – semi-structured interviews

As highlighted in the beginning of this chapter, for the better understanding of the company's initiatives, priorities and current state, information is required from the managers as well. This allows to better handle any bias that might be because of the employees' perception, but also gives better insight in the way the organization works as well.

For collecting this information, semi-structured interviews with managers from each participating company were set up. The full set of questions that the

interviews are based on are presented in appendix B. The questions have been divided in sections according to which sub model the answers can be related to.

6.3 Case studies

Two case studies were undertaken with manufacturing companies from U.A.E. For each case study, different scenarios were simulated based on the suggestions from the managers participating in the study. For anonymity reasons the case studies will be referred to as Case Study A and Case Study B. The first case was in a packaging SME whereas the second case was in construction materials manufacturer company. For each of the two companies, a number of employees answered the questionnaire and a manager was interviewed. The data was used to correct the model, fine tune the equations, set the initial parameters values and choose the current initiatives.

6.4 Case study A

6.4.1 Introduction

Company A is a small and medium enterprise manufacture that produces packaging material. It is mostly working as a make to order company and has been financially sound. The company employees 40 employees with 25% of them to be considered as high performing ones.

The company is relying on the high performing employees, at through their work it can save on cost that then it can be invested for various initiatives internally. However, the savings are only cost related and not time related. Thus, if the company wishes to implement initiatives that require time, this will have to be sourced and supported by the company.

The managers within the company exhibit a leadership style that resembles to a great degree the "telling" leadership style. This was supported by both the managers and the employee's responses to the interview questions and questionnaire respectively.

The only initiative that can lead to saving time is the schedule pressure, although reducing overtime would be considered a priority if possible. The employees

believer that are under schedule pressure 60% of the time (supported by the mangers answers as well), and the overtime that the accumulated during a month is approximately 20% of their regular working hours.

The company has an established quality control system, that is used for balancing the attention to detail lost that is caused by the schedule pressure. However, quality does not directly affect performance. The average quality gap to the desired quality level is 10%.

The company is also offering well-being activities to the employees through a well-being programme established for more than five years. Furthermore, the company invests in a number of environmental initiatives. There are no policies in place for flexible work. The absenteeism level is usually less than 5%. Employees state that they are highly satisfied with their jobs and they are highly motivated by the reward system. Most of them are not really interested by the prospect of a career development.

6.4.2 Experimentation

In agreement with the management of the organization and following the review of the suggested improvements by the employees, four experiments were decided to be run, as shown in table 6-1.

Table 6-1 Experiments / scenarios

Scenario
Exp1: Changing initiatives
• *Leadership style to "supporting 50% and delegating 50%",*
• *Changing the career path initiative to reinforce both environment initiatives*
Exp2: Resources investment (continuous)
• *Using current initiatives, but adding resources to reinforce them*
• *Extra inflows of 10 time units and monetary units*
• *Use of time initiatives*
Exp3: Resources investment (initial)

• Use current initiatives and add resources to reinforce them

• Initial stocks of 100 time and 100 monetary units

Exp4: Resources investment (initial), focus on avoiding performance losses

•Initial amount of resources increased to 1000. The total expense ratio of these resources has been reduced to 10% to avoid expending all of them in the first days

•3 performance losses to avoid:

o Absenteeism – fixed at 5%, cannot be changed by initiatives

o Equal effort – reduced by reaching high numbers of HP.

o Employee well-being – to improve it, increase

6.4.3 Results

The starting point is to model the as-is situation. All the resources generated by the high-performance employees are used in the initiatives. Using the model developed, the high-performers stock was calculated for a year (fig. 6-2). There is an initial increase in the performance due to the initiatives. After one month, the quality control activates (the system checks the quality gap once a month and changes the attention to detail to reach the desired quality). This lowers the performance down to almost the initial value of 10 high performers. From that point, the performance oscillates around the 11 high performers value due to the quality control system. Compared to historic data, this proved to be the case for the organization verifying the validity of the model.
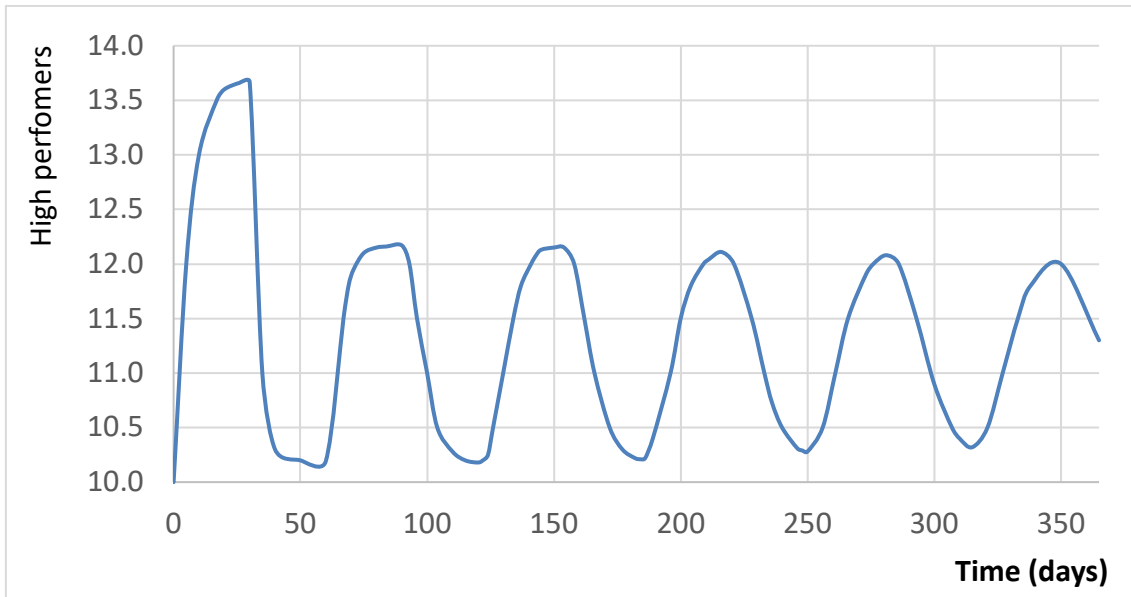
Figure 6-3 As-is situation model predictions

Fig. 6-4 compares the outcome of the simulation of scenarios. Exp1 indicates that changing the initiatives results in higher number of high-performing employees. When the quality control system is activated the average level of performance decreases by a significant amount and stabilizes with minor oscillations at 27 high performers. Exp2 shows that the speed in performance change is not affected by adding more resources. However, the number of high-performing employees is better compared to the as-is state. Exp3 shows that the initial stocks greatly affect the speed at which the performance levels change. However, once they are consumed the performance slowly decreases to the same level as in current situation with no factors. Finally, Exp4 indicates that although the initial evolution of the performance levels is promising, after the first month there is a quick loss of performance resulting in a worse situation compared to as-is.
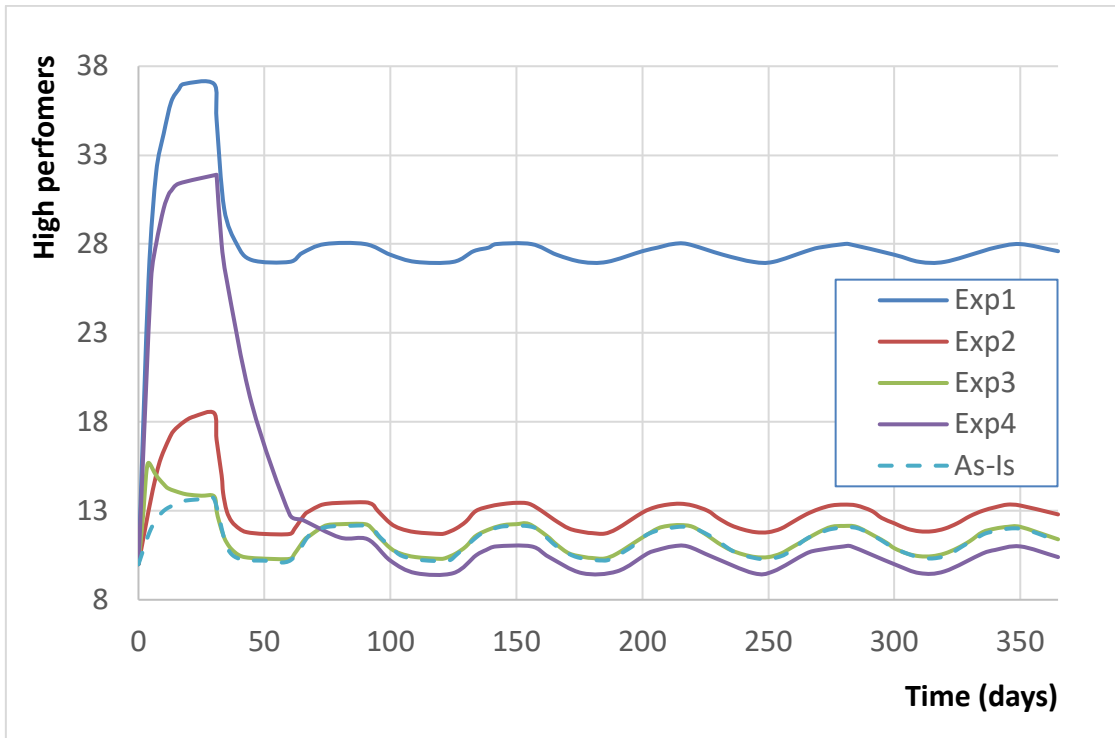
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Figure 6-4 Scenarios comparison

6.4.4 Findings

The key findings from this analysis can be summarized in the following list of bullet points:

- The simulation of the current state indicate that the initiatives in place will not result in significant improvements in the employee performance
- The employee performance varies significantly throughout the year (almost 20%). As the performance increases these variations decrease though.
- Implementing initiatives proposed by the employees can have a significant impact on their performance
- Resource investment yields worse improvements than changing the focus to the correct initiatives
- Initial stocks of resources increase the speed of performance changes, continuous inflow of resources increase the final levels of performance

- Hypothetically, a great enough investment paired with initiatives which focus on reducing performance losses should reach final levels of performance higher than the regular ones.
- The fluctuations due to the quality control system cannot be avoided, but can be reduced simply by achieving better performance levels
- Performance gains are necessary to improve the current situation, but the method to achieve and maintain the highest levels of performance is by reducing the performance loss

In this case study, the company would be advised to implement initiatives to reduce the burden of overtime. However, as the high-performance employees only generate monetary resources, these initiatives cannot be self-sustainable.

The results were presented to the company managers, for their feedback. The three managers involved considered the results logical. They can be used for board meeting discussions in order to decide the policy that would be more appropriate to adopt.

6.5 Case study B

6.5.1 Introduction

The second case study was based on a manufacturing company that is in the construction materials business. The company employees 300 persones, with 60% of them considered as high performers initially.

The company is relying on the high performing employees, at through their work it can save on cost that then it can be invested for various initiatives internally. Their performance results also in higher productivity, thus more time is freed up that then can be invested in other initiatives.

The managers in the company have adopted a mixed leadership style, presenting characteristics of both delegating and supporting styles. The company is investing considerable amount of money and time in training and development programmes for the managers employed.

The company is investing in developing its employees through training programmes. Furthermore, they have currently a number of initiatives set up on well-being programmes. It also provides the chance to the employees to work overtimes. In average all employees are claiming overtime that accounts for 10% of their normal hours. As the employees are happy to work overtime, this does not affect their wellbeing.

The effectiveness of the training programmes is high, resulting in improvements to around 50% of the work tasks. The schedule pressure is almost constant (80% of the time). Attention to detail however is varying throughout the year and is affected by deadlines. Quality wise, there are no issues reported thus the initial quality gap is zero.

The company is also offering well-being activities to the employees through a well-being programme. Furthermore, the company invests in a number of environmental initiatives. There are policies in place for flexible work. Job satisfaction is high (same as case A) and the absenteeism level is usually less than 5%. Employees state that they are highly motivated by the reward system, although it is not formal. There is not a fixed career path..

6.5.2 Experimentation

In agreement with the management of the organization, three experiments were decided to be run, as shown in table 6-2.

Table 6-2 Experiments / scenarios

Scenario
Exp1: Modify the initiatives in place
• *Reduce well-being activities and overtime initiatives to 70% for increasing the available time for training*
•*Reducing environment health and well-being programmes to 90% for increasing the available time for delegation of activities (change of the leadership style mix)*
Exp2: Saving resources

• All initiatives are halved so that the overall expenses are down to 50% for each resource

• Keeping the expenses at 100% so that stocks do not increase, while the amounts expend in the initiatives increase.

Exp3: saving resources while keeping EWB steady

• Overall expenses are reduced to 50% (as per Exp2) while related variables to well-being are increased. Total expenses of each resource are reduced 75%
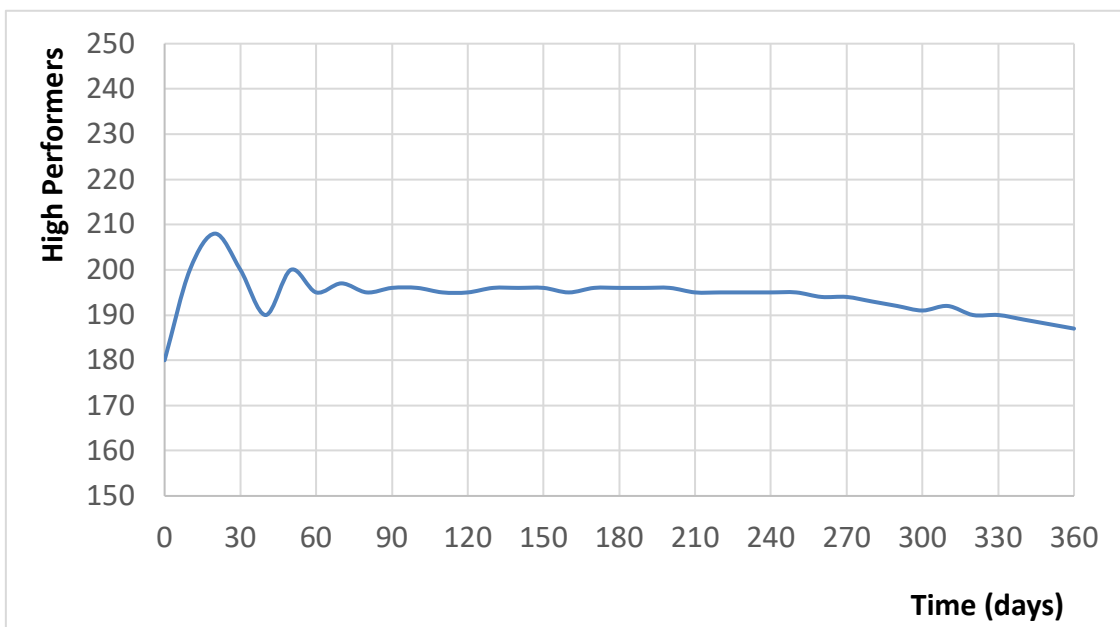
6.5.3 Results

Figure 6-5 As-is situation model predictions

The simulation of company's current practices with regards the improvement of the employees' performance are shown in figure 6-5. The immediate effect of the initiatives are positive, and the number of high performers increase fastly. However, as can be seen by the figure, a fading out oscillation is observed with regards the number of high performers. When the quality of the production drops below a threshold, the quality control system kicks in and the oscillations in performance levels generated are negligible after about 2 months. There is a 10% increase of performance in the long run, although after about 10 months, the

impact of the initiatives starts to fade out. The predictions present a pattern that is confirmed by the company managers as well.

Fig. 6-6 compares the outcome of the simulation of scenarios. The suggested actions in the first experiment (Exp1) seem to work as per the predictions of the model, as the number of high performers is increased drastically, and then it is kept up to that level almost throughout the year. The time gained through the savings and the investment of this time for training seems to be working well.

On the other hand, the changes proposed in the second experiment (Exp2) do not produce positive results. The number of high performers initially drop from the initial value. This can be due to the slow effectiveness of the improvement initiatives, i.e. they are not effective enough to counter the performance losses. Nevertheless, this decreases the performance losses and allows the performance level to increase past the initial value, but only slightly.

Finally, the third experiment (Exp3) produces the same results as the current practices of the company, but at the same time this is achieved by using 25 resources.
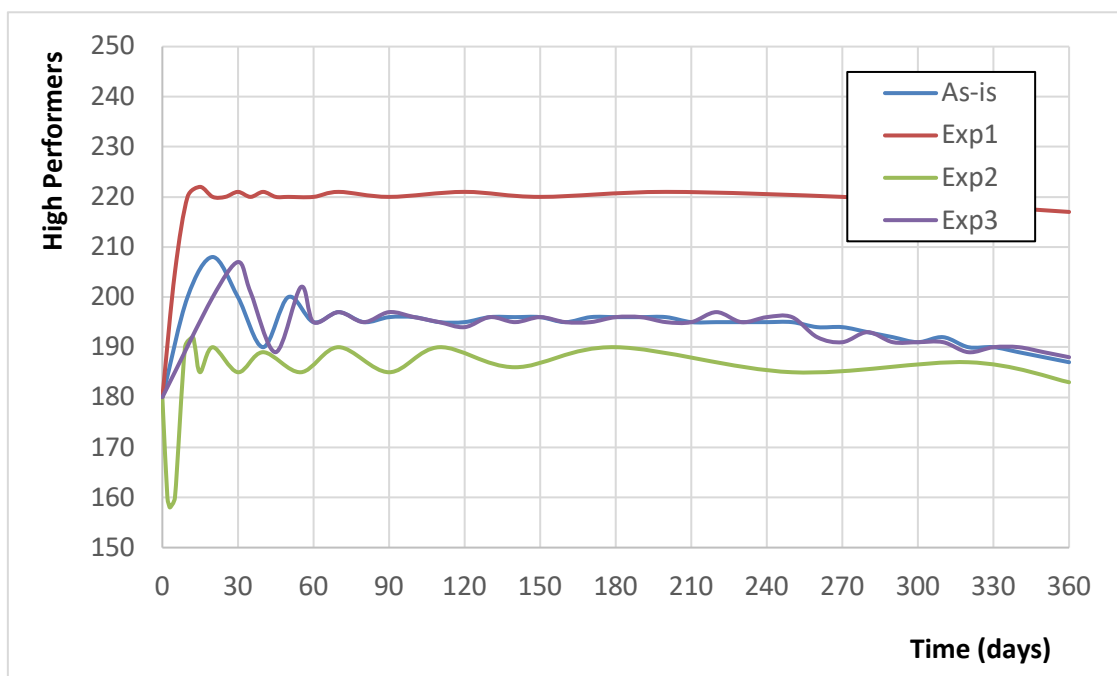

Figure 6-6 Scenarios comparison

6.5.4 Key findings

The key findings from this analysis can be summarized in the following list of bullet points:

- The simulation of the current state indicate that the initiatives in place are appropriate for the needs of its employees
- There are variations in the performance of the employees, but the quality control system in place reduces their impact.
- The higher the number of high employees, the lower the variations of the number
- The performance improvement is not greatly affected by the volume of resources allocated to the initiatives.
- Reducing the resources allocated to the initiatives affects even the best-performing systems
- Performance losses have a greater impact on the final performance level than the performance increases (at overall high levels of performance)
- The initiatives are self-sustainable thanks to the initial high levels of performance and the positive responses from the employees to the different initiatives
- While focusing on well-being is fundamental, its level should also be controlled to avoid over allocating resources that could be saved

According to these tests, the key to high levels of performance that the company had since the beginning is the focus on the well-being programmes (this can be seen in the AS IS situation).

The results as in the previous case were presented to the company managers, for their feedback. The managers involved considered the results logical.

6.6 Summary of the chapter

In the present chapter, two case studies in different companies were presented. In order to collect the necessary data for the models, a research data collection protocol was developed. Both case studies were undertaken in companies in the UAE, and the results were presented to the managers of the companies for two

reasons: first in order to check whether such results make sense, and second for providing some indication of how potential changes (experiments) will have an impact on the employee performance. It was proven that such approach can be used by companies in order to assess different change scenarios and help with the decision making.

7 DISCUSSION AND CONCLUSIONS

7.1 Introduction

In the present chapter, the discussion and the conclusions of the present work are presented. The chapter starts with discussing the key expectations from the leadership as these have been derived from the literature review and the models developed. The discussion of the key research findings are presented as well as the key contribution to knowledge.
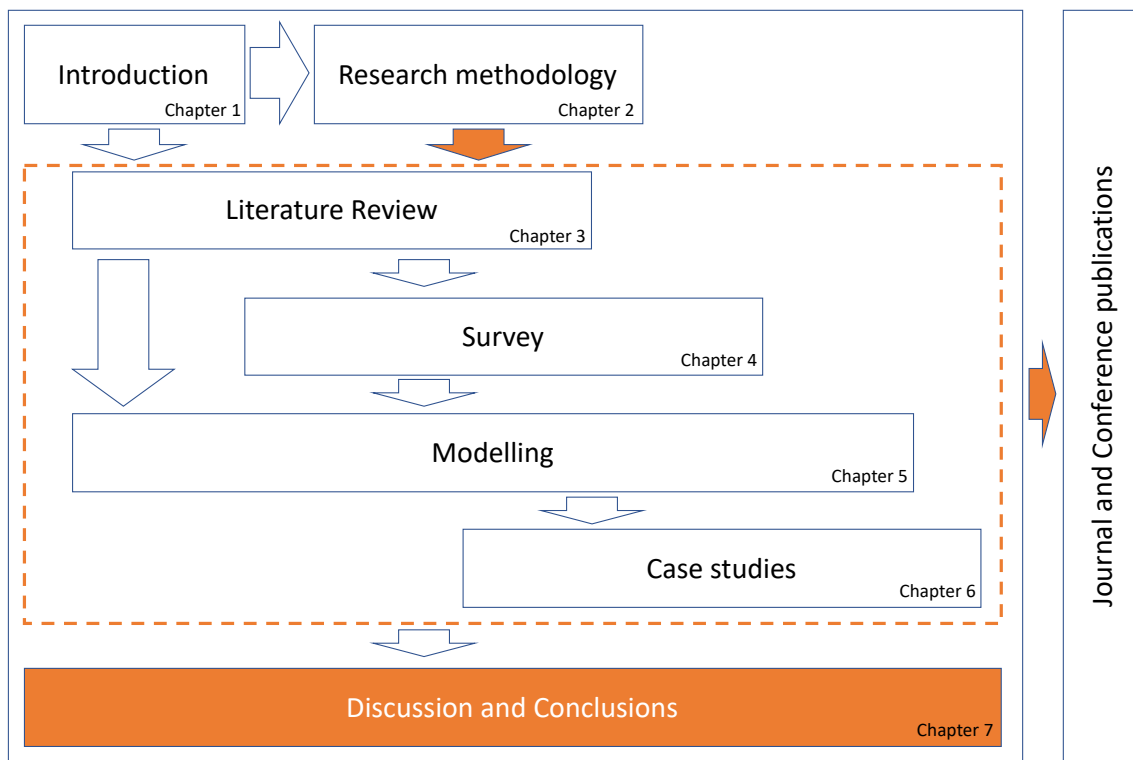

Figure 7-1 Chapter 7 within the whole thesis

The overall aim of the present research was to develop models that can be used for assessing different scenarios that can be implemented for improving the employee performance. The best modelling technique selected for achieving this aim is system dynamics, as it allows the level of abstraction required for such as problem. The research presented is characterized as a mix of qualitative and quantitative one. The required data collection included both primary and secondary data. Primary data were collected from a number of surveys carried out in order to understand the importance of different factors on employee

performance, and secondary data were collected from literature review for supporting the findings from the surveys.

A six phase approach was adopted, as can be seen at the end of the research methodology chapter. Phase I dealt with the formulation of the research problem. Research background was investigated, and the problem was clearly defined. The thorough literature review was completed at the second phase. The subsequent phase III was focused on conducting a set of industry surveys that were guided by the findings in the literature review. Phase IV was focused on the development of the system dynamics models, that are presented in detail in chapter 5. Phased V was focused on identifying the best way to collect the required data for running the models, and that was tested and used eventually in chapter 6 for the two validation cases.

The present chapter will highlight the key conclusions of the present study. Section 7.2 will summarize the research aim and objectives that were set in the beginning of the research. Sections 7.3 will be focused on the key expectations from leadership as these were concluded from the literature review analysis and the study field analysis. Section 7.4 discuss the contribution to knowledge. Discussion on areas of future works in light of the thesis is presented in section 7.5 and finally in section 7.6 conclusions are drawn.

In chapter 1, the research aim and objectives were set for the present study. The aim of the present research was to develop an improvement framework based on system dynamics for enhancing employee performance in the UAE small and medium manufacturing enterprises.

In order to achieve this aim and to measure the level of achievement, four research objectives were set. The first research objective was to analyse the global current trends employee performance assessment and employee performance improvement through a thorough literature review. This research goal was addressed through a thorough literature review that was presented in chapter 3 and parts of it were presented into two conferences.

The second research was to assess the current practices with regards employee performance in the UAE based manufacturing companies focusing in identifying (i) the methods used for employee performance assessment, (ii) the factors that affect employee performance, (iii) the ways adopted for improving employee performance and their efficiency. The first one was based on a survey through a structured questionnaire for assessing the methods. The results of this survey were presented in chapter 4 as well as in one conference paper. Furthermore, in order to investigate "deeper" and understand the hidden relationships among the various variables, another two surveys were conducted. The results of this work were presented in chapter 4 and published in one journal publication.

The third focus was to develop a model based on system dynamics for the continuous improvement of the employee performance in the manufacturing companies. This was developed based on the findings from the surveys and the literature review and was presented in chapter 5 and in one journal publication.

Finally, the last research objective was to validate the model through case studies that was also presented in the previous chapter. Two case studies in two different manufacturing companies were conducted. These have also been presented in one conference paper and one journal paper.

7.2 Key research contribution

The research has been successful in providing contribution to knowledge in the following ways:

1 – a structured literature review on the factors that can have an impact on the employee performance was presented. A thorough literature review focused on publications presented in the last five years, that can help academics structure their research

2 – understanding on how employee performance is considered within manufacturing organizations in the UAE through a number of surveys.

3 – development of system dynamics model that can be tailored to specific companies based on the answers of employees and managers in a pre-populated

questionnaire and semi-structured interviews respectively. The tailored model can be used by manufacturing organizations to run scenarios of changes, policies and assess the impact these changes will have on the employee performance.

7.3 Research limitations

As indicated by Akkermans and van Oorschot (2005), the use of models comes with their own limitations. The models developed are 'mental models', and not models of the 'real world'. It is thus clear that no model is a perfect representation of reality. By setting boundaries and dynamic hypotheses, representing employee performance becomes something feasible, but the results from the system dynamics model will have certain differences compared to the actual effect of the initiatives:

- The turnover of staff will affect the performance changes. Employees leaving or joining the company will affect performance differently depending on which level of performance they were in or they start in
- Additionally, new employees commonly go through a training period (different from the training initiatives in the model). While they are integrating in the company, the effects of the initiatives on them will vary
- The external environment was left out of the model because it would have to be individually modelled, but its potential impact on an employee's performance should not be disregarded. In the case that multiple employees were affected simultaneously by their respective environments, the model's accuracy would be severely affected.
- The sustainability of the initiatives depends on the extra resources generated by the high performers. However, these will change depending on the general business condition. Again, including the whole business operations accurately in one model is far from possible.

7.4 Recommendation for future research

Any model developed can be improved for better simulating reality. Some of the areas that could potentially further researched include:

- Include more variables and identify the relationships among the variables.

- Expand the leadership sub-model to address different classifications of leadership styles, such as transactional vs. transformational, democratic vs. autocratic etc.
- Address the limitations identified in the previous section

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APPENDIX A – Questionnaire for employee perception

The questionnaire aims to collect data for a PhD study regarding employee performance. The responses to this questionnaire are confidential and the data collected will neither affect employee performance appraisals nor be stored.

For each of the following questions, please select the response that best characterizes how you feel about the statement.

STATEMENTS	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Leadership					
Being told exactly what I should do helps me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Having someone explaining my tasks and coaching me helps me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Working on my own but having someone available to support me helps me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Training & Learning					
Organisational training programs help me learn faster	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Complex tasks are harder to learn than regular ones	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I learn better when I am motivated about my job	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
After learning new skills, I perform better at my job	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Adaptability					
Having one of my colleagues as a reference helps me adapt to organisational changes	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Organisational/Departmental changes help me perform better	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

STATEMENTS	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Schedule					
Schedule pressure stresses me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Lower attention to detail to comply with schedule decreases the final quality of my work	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Stress affects my well-being	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Overtime over long periods of time affects my well-being	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Motivation (to perform)					
A monetary reward system motivates me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Informal flexible work arrangements specially for me motivate me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Being satisfied with my job motivates me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Being committed to the organisation motivates me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Being motivated increases my performance	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Job satisfaction					
Good workplace conditions increase my job satisfaction	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Formal/Organisational flexible working arrangements increase my job satisfaction	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Better opportunities at the competition decrease my job satisfaction	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Equal treatment					
Other employees getting personal arrangements makes me feel treated unfairly	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

STATEMENTS	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Organisational Commitment					
Having the possibility of developing my career makes me committed to the organisation	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Being satisfied with my job makes me committed to the organisation	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Employee health/well-being					
Proper workplace conditions are good for my well-being	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I find well-being programmes (i.e. gym membership) useful for me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
I find well-being activities (i.e. stress relieving activities) useful for me	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
My well-being affects my work performance	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Absenteeism					
My well-being decreases my absenteeism	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Being motivated decreases my absenteeism	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

APPENDIX B – Semi-structured interviews perception

The semi-structured interviews are based on questions developed to collect data from the organizations' managers about the company's situation and initiatives. Additionally, the questions marked with an arrow symbol were the ones adapted from the questionnaire to collect data for this project. It should be noted that these questions serve as guidelines for the interview, but the interviewer must adapt them depending on the data required and the company itself.

<u>**Employee Performance**</u>
- Number of employees and categories/positions (managers, regular, trainees…)
- Which percentage of the employees would you consider to be high-performers?
- What are the main benefits the company obtains from these (high performance) employees?
- High performance employees allow the company to:
    - o Complete tasks faster, having then extra time for different activities
    - o Complete tasks faster, having then time for more tasks and generating more value
    - o Complete tasks better, generating more value

<u>**Leadership Styles**</u>
- Which leadership styles are mostly used in the company?
- Time spent by team leaders/managers in close and detailed leadership (coaching)
- Does leadership change according to the employees' necessities?
- Does the company invest in formation in leadership for team leaders/managers?
- ➢ How do employees tend to respond to these styles?

Time Initiatives

- Does the company have any training programme? (for experienced employees)
- Do the managers invest time in finding and training champions/change agents? (employees with good leadership and communication skills that can guide and support their peers in though projects or through organisational changes)
- How often do the employees suffer schedule pressures?
    - How intense can this pressure get?
    - Does the company invest time from other employees to relieve pressure from a specific project? (Apart from overtime)
    - Does the company lower the attention to detail/quality to meet deadlines?
- Is there a desired quality control system for the projects?
    - Do the projects usually meet the desired quality?
- Which levels of overtime do the employees usually have? (overtime hours/total hours)
    - Are other employees used to avoid overtime from a certain project/team?
    - Is it a priority to lower the overtime whenever possible?
- Are there any well-being activities being organised by the company? (using work hours for social events, stress relieving activities…)
- What is the effectiveness of the training programmes?
    - How complex are the new skills that the employees learn in them?
    - Do motivated employees achieve better results in the training programmes?
- How do employees respond to big departmental changes?
- Is there a clear effect of stress on the employee well-being?
- Do employees complain about the burden of overtime hours?

Money Initiatives

- Is there a monetary reward system for high-performing employees?
    - Conditions & expenses

- How much emphasis does the company have in improving work conditions that could affect work satisfaction?
- How much emphasis does the company have in improving work conditions that could affect the employees' well-being?
- Does the company put effort in developing the employees' careers?
- Does the company have formal flexible working policies?
    - Do they suppose a work time expense?
- Do the managers negotiate informal flexible working individually with some employees?
- Is there an active competition for the employees with other companies? (employees leaving for similar job positions due to other companies' offers and vice versa)
- Does the company invest money in well-being programmes for the employees? (sponsored gym fees, programmes related to mental health & stress…)
- What are the levels of absenteeism in the different groups of employees?
- How do employees respond to the reward system?
- Are employees, in general, satisfied with their work?
    - In the past, what factors have been a big influence for this?
- Do employees put extra effort in their work to achieve promotions or develop their career?
- Do employees make use of the flexible work programmes? Does this show an improvement in their performance?
- Are there frequent health related issues? (medical leave, reduced performance…)
- Do motivated employees show different levels of absenteeism than non-motivated?