Structural and Technological Diagnosis of
Quality of Services and Time Management
problems at Sun-Power

Master Thesis Information Sciences

Student: Alice Nasekwa Bulonza - s1019176

Supervisor: Dr. Dirk Jadder Vriens
Second Examiner: Dr. Ir. Eelco Herder
Supervisor at Sun-Power: Geert Buskes

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Preface

Organisations consist of both humans and technologies that may face multiple issues to interact with each other. This thesis “Structural and Technological Diagnosis of Quality of Services and Time Management problems at Sun-Power” analyses impacts of technological and structural parameters on Sun-Power’s time management and quality of services problems. The research was requested by Sun-Power director and owner Mr Twan Christiaens to improve the current state of the organisation.

I conducted a four months internship with Sun-Power from February 2019 to June 2019. Moreover, this thesis is written to fulfil Radboud University Information Sciences master graduation requirements.

I would like to take this opportunity to express my most profound appreciation to my supervisor Dr Dirk J. Vriens, for his helpful feedback throughout the research. His advice allowed me to finish this thesis.

Furthermore, I would like to thank my family for believing in me and in particular, my parents for their unconditional love and endless support.

Last but not least, I want to thank Jesus Christ for his direction in completing this research.

I hope the information in this thesis will facilitate many other future studies.

Please enjoy your reading.

Alice Nasekwa Bulonza

Nijmegen, August 05, 2019.
Abstract

Sun-Power is a recruitment agency for both temporary technical and agriculture workers (candidates) from the Netherlands. Sun-Power’s team identified Time Management and Quality of Services issues in the recruitment process that lead to this study to answer the research questions:

(1) What exactly are Sun-Power’s problems with the quality of services and time management?
(2) To what extent do the structural and technological parameters cause time management and quality of services issues in Sun-Power?

Furthermore, to answer these research questions, the study used interview data, observation data and academic studies (theories). For example, Kontio & Conradi (2002) software quality theory analyses the technological parameters of Sun-Power and, De Sitter’s design theory examines Sun-Power’s organisational structure.

Sun-Power proposed to solve the problems by upgrading the front-end services and building a better connection between the front-end and back-end services of the current software. However, before making any changes, this research will diagnose Sun-Power’s current state by evaluating the meaning of time management and quality of services in Sun-Power through the GAP analysis. Also, the CAUSE analysis will examine the extent to which technological and structural parameters could cause time management and quality of services issues.

Based on the research, the conceptual model findings elaborate on how both technological and structural parameters are indeed impacting time management and quality of services variables in Sun-Power. For instance, employees have to repeat the same information in different software as the current software does not automatically share data with other systems. And the recruitment tasks are divided into many sub-tasks conducted by different employees in various departments.

This research demonstrates the impact of the software quality and structural design on the time management and quality of services in Sun-Power and recommends technological and structural ways to attenuate time waste and amplify the quality of services.

Keywords: gap analysis; cause analysis; time management; quality of services; technological parameters; structural parameters
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Chapter 1 – Introduction

Sun-Power is a recruitment agency for both temporary technical and agriculture workers (candidates) from the Netherlands and the rest of Europe. In addition to recruitment services, Sun-Power also offers temporary posting, secondment, payrolling, recruitment, housing and transportation to the workers. Sun-Power’s yearly average placement is about 1000 candidates, and the minimum employment period for each candidate is about 15 weeks. Clients currently working with Sun-Power are agriculture and industrial companies seeking temporary workers in the Netherlands, mainly in the regions of North and Central Limburg, Southeast Brabant and Gelderland. Sun-Power is located in Tienray and was founded in 2000 to ensure that the right candidates are matched to the right clients. Tasks are split into three departments and the managing board. Firstly, the Sales and Marketing department is in charge of Sun-Power marketing and clients’ communications. Secondly, the Front-office team deals with administrative assignments, candidates’ recruitment and planning (transportations and accommodations). Finally, the Back-office is connected to the legal and financial side of Sun-Power to generate invoices.

In many countries, employers are becoming more interested in employing temporary workers (Zijl & Leeuwen, 2005). Based on the EU15 sample, the percentage of temporary employees grew from 10% in 1990 to 15% in 2007 widespread across EU15 countries with the Netherlands having the highest rate of 36% for part-time employment (Burgoon & Dekker, 2010). Indeed, temporary employment is a fast-paced industry due to market development in many business sectors.

The more the recruitment industry grows, the higher the demand for temporary workers increases, especially during the busy season from April to July (the growing season for crops). And, higher market demand increases Sun-Power activities that could affect both time management and quality of services in Sun-Power. In this case, proper time management in Sun-Power is the ability to deliver services on time to meet customer’s needs and grow Sun-Power as an organisation. For example, a more extended production cycle time (more than 24 hours) during the busy season can cause delays in recruiting candidates. And lead clients can fill vacancies by acquiring candidates from competitors, which will affect the overall revenue of Sun-Power. High-quality services mean Sun-Power’s ability to meet clients and candidates’ requirements. For
instance, one of the clients’ requirements is to have candidates that can speak English, Dutch or German. Sun-Power is negatively affected when this language requirement is not met.

Moreover, workers motivation is essential for agriculture jobs because candidates that have the wrong motivation are often not able to work until the end of their contract with Sun-Power. Also, candidates that do not have the required skills or workers over experienced for some technical jobs are dissatisfied with their work, which negatively affects clients and Sun-Power. Therefore, Sun-Power is currently facing time management and quality of services issues connected to technological and structural causes.

To deal with time management and quality of services problems, Sun-Power proposed to upgrade the current software by enhancing the front-end services in terms of the software user-friendliness, software speed and more. Sun-Power also intends to create a good connection between the front-end and back-end services because Sun-Power’s current system doesn’t allow the organisation to connect to different software such as the planning software, Sun-Power’s portal, financial reporting system, Sun-Power’s website and more. Thus, Sun-Power aims to build a stronger relationship between the firm and its core processes, which includes hardware, software, structure and employees.

Before we decide whether Sun-Power needs to upgrade the current system or make changes in the organisational structure, it should be first clear what precisely the problem is, then offer possible solutions. The diagnosis of Sun-Power is not clear yet because there is no clear idea of the exact problem related to the time management and quality of services, as well as their causes. Therefore, in this study, we will perform an analysis of Sun Power’s problems related to time management and quality of services. That is, we will identify the gap between the desired and actual values of the variables describing time management and quality of service. And, the information from the GAP analysis will facilitate the CAUSE analysis that will evaluate potential causes connected to Sun-Power’s quality of services and time management issues. Both technological and structural parameters norm and actual values will be analysed, because based on the research data, the problems are believed to be related to Sun-Power’s structure and software. For instance, one of the recruiters mentioned that when a candidate fills the registration form on the website, the recruitment team needs additional time to manually type candidates’ details in Sun-Power’s main software because there is no connection between the website and the software.
Other interviewees also shared their unpleasant experience with Sun-Power’s current system incompatibility. One of the indicators that the structure of the organisation also needs to be analysed is the “multiple division of tasks” within Sun-Power. And Sun-Power’s current structure has corresponding values to one of De Sitter’s production structure parameters (Achterbergh & Vriens, 2010).

Overall, the objective of this research will be achieved by answering the following research questions:

(1) What exactly are Sun-Power’s problems with the quality of services and time management?
(2) To what extent do the structural and technological parameters cause time management and quality of services issues in Sun-Power?

The first question relates to the gap analysis and the second question to the cause analysis. And based on the answers to these two questions, we can provide recommendations for future improvements. To answer these two questions (and to arrive at recommendations) we need to go into the following sub-questions:

**Diagnosis**

**GAP Analysis**
1. What do variables ("time management" and "quality of services") mean in Sun-Power?
2. What are the norm values of Sun-Power’s variables?
3. What are the actual values of Sun-Power’s variables?
4. What is the GAP between the norm and actual values of Sun-Power’s variables?

**CAUSE Analysis**
1. What are the technological and structural parameters causing time management and quality of services issues in Sun-Power?
2. What are the norm values of technological and structural parameters in Sun-Power?
3. What are the actual values of technological and structural parameters in Sun-Power?
4. What are the IT and structure related parameters that impact Sun-Power the most?

**Parameters’ Influence**
1. What are the technological and structural parameters that should be lowered by changes in Sun-Power?

Textbox.1. Research sub-questions – Sun-Power’s Diagnosis
The above research questions are discussed through qualitative interviews with several Sun-Power employees during a four months internship at the company. We created a conceptual model that enabled this research to solicit interviewees’ opinions about how technological and structural parameters are causing the quality of services and time management issues in their departments as well as in Sun-Power as a recruitment company.

Fig. 1. Thesis Preliminary Conceptual Model

The conceptual model will be analysed using empirical research to demonstrate ways that technological and structural parameters might be influencing time management and quality of services issues in Sun-Power. Evidence to support the goal of this research was collected using two research methods. The ‘bottom-up’ research approach investigated data about technological parameters in Sun-Power by connecting first Sun-Power’s existing technological parameters to Information Technology (IT) principles such as software quality theories. And the ‘top-down’ approach was also used in the study by first analysing De Sitter’s design theory and then connecting the theory to structural issues in Sun-Power. De Sitter talks about the characteristics of organisational structures, and this research will analyse which of the design parameters has higher values in Sun-Power (Achterbergh & Vriens, 2010). Moreover, in chapter two, this preliminary conceptual model will be extended using interview, observations and academic studies data.
The research is organised as follows:

**Chapter 1 - Introduction**
- The overall introduction of Sun-Power and the research goal

**Chapter 2 - Conceptual Model**
- What do variables ("time management" and "quality of services") mean in Sun-Power?
- What are the technological parameters causing time management and quality of services issues in Sun-Power?
- What are the structural parameters causing time management and quality of services issues in Sun-Power?

**Chapter 3 - Methodology**
- Research strategy
- Data collection methods
- Data analysis methods
- Research quality
- Research ethics

**Chapter 4 - Results**
1. GAP Analysis
   - What do variables ("time management" and "quality of services") mean in Sun-Power?
   - What are the norm values of Sun-Power’s variables?
   - What are the actual values of Sun-Power’s variables?
   - What is the GAP between the norm and actual values of Sun-Power’s variables?

2. CAUSE Analysis
   - What are the technological and structural parameters causing time management and quality of services issues in Sun-Power?
   - What are the norm values of technological and structural parameters in Sun-Power?
   - What are the actual values of technological and structural parameters in Sun-Power?
   - What are the IT and structure related parameters that impact Sun-Power the most?

3. Parameters' Influence
   - What are the technological and structural parameters that should be lowered by changes in Sun-Power?

**Chapter 5 - Conclusion and Recommendations**
- Overall research conclusion and future recommendations

*Fig.2. Thesis outline*
Chapter 2 – Conceptual Model

In this chapter, we will discuss the conceptual model of the research supported by empirical studies. As mentioned in the introduction, Sun-Power is a recruitment agency for both temporary technical and agriculture workers (candidates). According to Zijl & Leeuwen (2005), many employers are becoming more interested in employing temporary workers due to the flexibility of temporary employment. For instance, the percentage of temporary employees grew from 10% in 1990 to 15% in 2007 widespread across EU15 countries with the Netherlands having the highest rate of 36% for part-time employment (Burgoon & Dekker, 2010). This means that the recruitment market is continuously increasing and Sun-Power needs to keep up with the market demand because a broader market creates more competitive challenges. The conceptual model will discuss technological and structural parameters that are influencing Sun-Power’s essential variables (time management and quality of services). This research identified the variables and parameters throughout a four months internship at Sun-Power. Interviews, observations and academic data enabled the understanding of the meaning of “time management” and “quality of services” variables in Sun-Power. And how technological and structural parameters are impacting the two variables

2.1 Essential Variables: Time Management and Quality of Services

Sun-Power’s team identified two problematic variables in the organisation that are time management and quality of services. The variables are relevant for Sun-Power and this research because the data shows that the company’s recruitment process is taking longer than desired, and candidates do not meet clients’ requirements. Before evaluating the impact of these variables and comparing their norm and actual values; this research will use the conceptual model to investigate the exact meaning of time management and quality of services for Sun-Power’s survival.
2.1.1 Time Management

The Oxford dictionary defines time management as the key to ‘efficient working’. Time management is a general term and can have diverse meanings depending on the organisation’s values or goals. Every company works on deadlines and proper time management enables employees to complete tasks within the required time with no working stress and implementing task prioritisation for effective results. The way time is managed to deliver products or services is essential to meet customer’s needs and build the company’s reputation. Time management in Sun-Power is the organisation’s ability to provide services on-time throughout the year. Sun-Power works with agriculture and technical clients. Therefore, the period from April to July of every year is the harvesting period when clients require more temporary workers. April to July is the busy season comparing to the rest of the year. Based on the two working seasons for Sun-Power, there are two variables describing time management in the organisation:

1. Services delivery time

Many companies have different processing time to deliver services. In this case, Sun-Power’s final product is providing the right candidate to the right client. The director and owner of Sun-Power mentioned that services delivery time plays a crucial role in the recruitment process because there are many competitors in the market. In case Sun-Power delays the recruitment process, clients can acquire candidates from competitors. Hence, time needs to be managed correctly to deliver services on time to meet clients’ needs and grow Sun-Power as an organisation.

2. Services delivery time during the busy season (April-July)

The recruitment process in Sun-Power doesn’t have the same speed throughout the year. Around April to July every year, the demand for temporary workers increases because during this period agriculture companies are harvesting. Consequently, the production cycle time needs to be shorter to handle multiple candidates demands at the same time. Time management is important for every organisation, and this research analyses Sun-Power’s production cycle time and its connection to time management. Based on many interviews with Sun-Power employees, services delivery time, especially during the busy season, seems to be problematic in Sun-Power. For example, one of the recruiters stated that “sometimes it’s too busy for Sun-Power to recruit the right candidates for all clients’ vacancies on time.”
Moreover, with a shorter recruitment cycle time throughout the year, Sun-Power can delivery services on time and extend their goal to recruit 1000 candidates. Sun-Power’s time management desired values is to deliver services between 1 to 2 working days throughout the year and having a shorter cycle time of 24 hours for the busy season. Information about Sun-Power was collected during empirical research at the organisation. And this study will explain the actual values of time management in Sun-Power and why the company wants these specific desired values for the future.

2.1.2 Quality of Services

The degree of services excellence in Sun-Power can be described by two variables: “rate of filling all vacancies” and “clients and candidates’ satisfaction rate”. Sun-Power aims to fill all the clients’ available jobs with candidates that will enjoy their responsibilities. We know that there is a quality issue in the organisation as stated by the director and owner of Sun-Power that “Sometimes we do not know enough from the candidate in order to put him/her in a place where he/she fits the best and that’s a quality problem”.

1. Clients and candidates’ satisfaction rate:

Customers’ satisfaction is generally attained when actual performance meets or exceeds the customer’s expectations (Elliott & Healy, 2001). In this case, both clients and candidates are Sun-Power’s customers. Excellent quality of services means Sun-Power’s ability to meet all clients and candidates’ requirements for every vacancy.

- Clients’ satisfaction rate

Sun-Power clients’ requirements are descriptions of clients’ needs available in the “Recruitment Information guide”. Clients’ requirements provide a set of standard to recruit candidates such as ‘candidates should be able to drive legally and their willingness to drive’, ‘candidates should be able to read’, ‘candidates need to have some computer skills’ and more. Sun-Power uses clients’ requirements as a recruitment guide to match the right candidate to the right client. Therefore, when some specific details are not observed in the conditions during the recruitment process, the quality of services is affected, and clients are not satisfied.
- **Candidates’ satisfaction rate**

Sun-Power’s candidates play an essential role in the organisation because Sun-Power employs candidates to build ambassadors who are satisfied with their jobs. The entire process to recruit candidates needs to be carefully looked at to provide an excellent experience to temporary workers.

The desired value of Sun-Power’s customers’ satisfaction rate is having 99% of clients and candidates happy with Sun-Power services. For example, clients must be able to communicate with candidates either in Dutch, German or English. Also, candidates’ motivation for the job is crucial as it influences the quality of their work. 99% satisfaction rate does not describe in details how the quality of services is impacting Sun-Power. Therefore, in the results section of this research, we will explain further the values of the satisfaction rate in Sun-Power.

2. **Rate of filling all vacancies**

The quality of the services offered by Sun-Power can also be measured by how many vacancies the organisation can fill. For a recruitment company, the degree of excellence of their services also depends on their ability to deliver needed candidates. The market demand for temporary workers is increasing, and creating a high number of vacancies. Sun-Power has a personal goal to recruit about 1000 candidates yearly. Moreover, this goal is established by Sun-Power based on their previous years’ performances. To be able to move forward in the future, Sun-Power desires to fill about 99% of the 1000 vacancies. Hence, the research data will be examined to understand how Sun-Power and customers relationships can be affected by a lack of flexibility to fill all vacancies available from clients.

2.2 **Technological and Structural Parameters**

Sun-Power’s structure and software related parameters are believed to cause time management and quality of services problems in Sun-Power. Therefore, this research will examine both technological and structural parameters. In this section, we will introduce and expand these parameters to provide a clear understanding of what we infer by technological and structural parameters in Sun-Power.
2.2.1 Technological Parameters

Organisations are not just people but sociotechnical systems (Christis & Soepenberg, 2015). Lowlands Sociotechnical Design (L-STSD) theory states that IT services deserve attention and improvement since people use all kind of technology in businesses. For example, Sun-Power’s primary process uses technology (software) for recruitment, planning and payrolling. Moreover, to evaluate the extent to which this software is impacting Sun-Power’s operations, we will analyse Sun-Power’s system. Software analysis in this study includes evaluating some software architectural qualities such as usability, efficiency, reliability, functionality and more; also called software quality. Kontio & Conradi (2002) software quality theory states that it is essential to emphasise on the software quality to ensure the success of the business’ technical environment. Although the term “quality” is widely used, the way it can be achieved as part of a software production process is different in every organisation. This research will evaluate both the product quality and user-perceived quality of the software. The product quality in this research will focus on determining the non-available characteristics of the software. And, the user-perceived quality is the explanation of the product satisfaction level by the user (Bevan, 1995).

Bevan (1995) also stated that it is challenging to achieve excellent product quality without an effective quality system. In this case, Sun-Power’s software quality can affect the quality of services and time management in Sun-Power. Sun-Power can achieve high-quality user experience when the whole chain of devices, servers and other network infrastructure components work together reliably. This implies that all applications must be designed and managed appropriately to meet Sun-Power’s goal. Software quality is becoming increasingly important in this new era of technology. Therefore, Kontio & Conradi (2002) quality model for external and internal equality of the software will be used in this research to evaluate the impact of technology in Sun-Power.
Fig. 3. Quality Model for External and Internal Quality

Source: (Kontio & Conradi, 2002)

All the quality’s measurable factors elaborated in the graph above are necessary for a software assessment. However, after many interviews and observations of how Sun-Power’s current software works; this research will discuss only four relevant factors of the company’s back-office software.

1. The **functionality** of Sun-Power’s software is about the software ability to deliver what it is intended to do. For example, the system’s customisation to meet Sun-Power’s recruitment needs and develop the quality of services. In other words, proper software functionality of a system includes its ability to have several personalised features that bring value to the organisation’s primary goal. For Sun-Power, one of the main features is having a system that can accurately match the right candidate to the right client.

2. Software **usability** is one of the independent contributions to the organisation’s software quality. For instance, the user interface, communication means and more. Improving usability is beneficial to develop more user-friendly software. Usability effectiveness, efficiency and satisfaction are important factors. These factors help measuring whether users can achieve their goals using the software (usability effectiveness); how much effort is needed from users to achieve their goals (usability efficiency); and how happy are the
users with the system (usability satisfaction) (Bevan, 1995). One of Sun-Power’s employees stated: “I work with the software, but I am not happy with the matching system because the system doesn’t always give relevant results”. Therefore, software usability is affecting essential variables in Sun-Power, and the impact of this parameter will also be explained further in this research.

3. The system **efficiency**, in this case, is the software speed, that plays an essential role in the recruitment process. A system can be characterised by its speed, such as the time it takes to process inputs, also called ‘response time’ (Joseph & Pandya, 1986). Sun-Power wants to manage time better by having a high speed and quick loading system that will be described using the empirical research data.

4. Software **reliability** is a part of factors defining a system and can be described as quality error or human mistakes that cause the system not to work as expected (Cristescu et al., 2015). For example, omitting some requirements during programming, such as software compatibility with other systems (Cristescu et al., 2015). Sun-Power desires a system that has high-level reliability or minimum level of software errors. One of Sun-Power’s planners mentioned: “I have to type the same information in 3 different software”. This is a waste of time, and the system errors leave room for mistakes to occur in the recruiting process.

Technological parameters affect the way Sun-Power works and delivers services because employees are interacting with the software to perform their daily tasks. Sun-Power employees stated the software issues, and all the above parameters have a set of values that describes their impact on Sun-Power’s primary process. Thus, in the result section, we will extensively explain Sun-Power’s technological desired and actual values.
2.2.2 Structural Parameters

De Sitter’s design theory is about understanding the division of work within an organisation; which also refers to the organisational structures characteristics by Ashby (Achterbergh & Vriens, 2010). Ashby (1958) cybernetics theory talks about how organisational structures may attenuate disturbances and amplify regulatory potential, to deal with disruptions by paying particular attention to essential variables values that are closely tied to the survival of the organisation (Vriens & Achterbergh, 2011). For example, time management is an essential variable in Sun-Power because clients will acquire temporary workers from competitors in case Sun-Power faces multiple delays. And this will affect the revenue and the future reputation of the company. Accordingly, companies need to organise tasks and relate them in such a way that the organisation’s ‘primary transformations’ can be realised and can be cybernetically sound (attenuate disturbances and amplify regulatory potential). According to De Sitter, an organisational structure should reduce the probability of problems occurring in Sun-Power. And deal with the occurring disturbances by keeping in mind De Sitter’s essential variables: quality of organisation (effectiveness of the organisation to adapt to its goal), quality of work (meaningfulness of the job), quality of relationship (the effectiveness of communication within the organisation).

Fig. 4. Designing organisational structures
Source: (Achterbergh & Vriens, 2010)
From De Sitter’s three variables, this research will only focus on the ‘quality of organisation’ as Sun-Power is being affected by two organisational variables that are ‘time management’ and ‘quality of services’. Transformations (tasks) need to go through a process that causes the beginning state to change into the end state. And throughout the process, tasks need to have specific values to be able to help Sun-Power measure ways to attenuate disturbances and amplify regulatory potential practically.

De Sitter explains seven design parameters and argues that high values parameters create more disturbances. But low structural parameters create chances for ‘rich’ meaningful survival for an organisation. As every organisation is different, the ‘meaningful survival’ for Sun-Power is being able to deliver the right candidates to clients at the right time. Based on the research data, the most relevant design parameter for this research is the ‘Level of specialisation of operational transformations’, also referred to as ‘how much tasks are split up into small sub-tasks and become separate tasks (Achterbergh & Vriens, 2010). For instance, in Sun-Power the operational transformation ‘recruiting candidates’ is specialised and decomposed into smaller sub-transformations ‘Matching’, ‘Follow-up’, ‘Job advertisement’, and ‘Database update’; and each of these transformations is a separate task accomplished by an individual employee. Sun-Power splitting transformations into sub-transformations matches with De’ sitter reasoning that states that every additional relation within a task will add relationships between sub-transformations, leading to a higher probability of disturbances (Achterbergh & Vriens, 2010).

A high value of the level of specialisation of operational transformations is problematic in Sun-Power because it causes an increase in working pressure due to the high number of relation and constant communication within departments. A sales manager at Sun-Power mentioned that there is a high level of communication within Sun-Power because tasks are closely connected for execution. For example, some of the sales managers do the intake process to recruit technical candidates; which leads to more communication between the front-office and the sales &
marketing departments. Generally, this leads to a complex network with continuous supervision. The more tasks are split, the more the organisation loses the overview of what needs to be done by whom. Consequently, the operations become complex and gradually, the organisation loses control over the quality of services since individuals are focused only on their tasks. With multiple division of work, the organisation becomes slow to react immediately to occurring disturbances leading to an increase in the production cycle time. Using De sitter’s reasoning, this research will evaluate the values of the level of specialisation of operational transformations in Sun-Power and ways to lower them.

Structural parameters need to be low in value because Sun-Power is growing and continuously sub-dividing tasks within the organisation will lead to more delays and disturbances. This research will evaluate whether transforming the current structure into the desired (low parameter value) will improve the time management and quality of services issues in Sun-Power. The level of specialisation of operational transformations is problematic in Sun-Power, but low structural parameter values will fit Sun-Power specific context where tasks are self-contained in departments and adding values to Sun-Power’s goals. To reduce disruptions in the recruitment process, Sun-Power desires a structural parameter that is low and able to attenuate time waste and amplify the quality of services.
The overall idea of the conceptual model is to evaluate which technological and structural parameters are currently affecting time management, and quality of services in Sun-Power; and to use the information to achieve values that will be beneficial to Sun-Power’s primary process.

**Fig.6. Thesis Conceptual Model**

The data used to describe the conceptual model included information collected during empirical research. The norm values of the essential variables and parameters have been briefly introduced in this section. However, for better understanding of both Sun-Power’s problematic parameters and parameters that no longer act as a cause for time management and quality of services issues, this study will use the research data to elaborate the meaning of essential variables and parameters for the current and future state of Sun-Power.
Chapter 3 – Methodology

The methodology section is essential to understand the methods used to diagnosis Sun-Power’s issues. Sun-Power requested the examination of their current system and structure to determine how improvements can be made using the result of the empirical research. This study conducted an inductive analysis of the interview data with existing theories. The objective of the research is to evaluate the GAP analysis of time management and quality of services (essential variables) in Sun-Power; and the CAUSE analysis of technological and structural parameters impacting essential variables.

3.1. Research Strategy

This research will analyse Sun-Power’s time management and quality of services issues to provide clarity about Sun-Power’s problems and their causes. To understand the causes of the current problems in Sun-Power, it is essential to compare the norm values of both variables and parameters with the current situation in Sun-Power. And we will use two main methods to diagnose Sun-Power’s issues:

(1) **GAP analysis**: Investigating and understanding Sun-Power’s essential variables (‘time management’ and ‘quality of services’) by analysing and comparing their norm and actual values.

(2) **CAUSE analysis**: Examining and comparing technological and structural parameters’ norm and actual values; and how they affect essential variables.

Moreover, two research methodologies are used to examine the values of current problematic behaviours in Sun-Power. First, the bottom-up approach facilitated the examination of technological parameters by first analysing current IT issues in Sun-Power and then match them with IT theories. And, the structure of Sun-Power was evaluated using the top-down approach that starts by assessing existing structural theories and then connect relevant theories to Sun-Power’s issues.
3.2 Data Collection

To answer the research questions, this study conducted fifteen interviews with thirteen employees from Sun-Power. The duration of each interview was about 1 hour, and respondents were chosen based on their roles in each department. Interactions with Sun-Power employees generated knowledge by collecting and interpreting the interviewees’ perception of the company (Kvale, 1994). This research used semi-structured interviews taking in considerations new opinions from the interviewees. Both the primary data from interviews, observations; and secondary data from academic studies and Sun-Power documentations were collected in textual and recording format upon informants’ permissions. The collected research data helps in performing an inductive analysis using the diagnosis method.

3.3 Data Analysis

For better analysis few methods were used to evaluate data:

1) **Data validation**: data validation analyses the accuracy and completeness of the collected data. For instance, measuring data accuracy by comparing employees’ responses with the information in Sun-Power’s official documentation such as the “Procedure handbook” or the “Information guide”. For the completion of the data, we rescheduled additional interviews with some key employees.

2) **Content analysis**: the data was continuously analysed throughout the research using a popular qualitative analysis software ATLAS.ti to identify patterns. After every interview, the information was scripted and evaluated in ATLAS.ti using series of coding (open, axial and selective coding).

3) **Observation method**: during the four months internship at Sun-Power, we observed Sun-Power’s environment and performed live demonstrations of how Sun-Power’s software works.

4) **Progress meetings**: hypotheses about the research progress were shared with Sun-Power management team throughout the study for feedback and evaluation purposes.

5) **Identify patterns and connections**: patterns and connections identified between data helped in achieving the data analysis conclusion. This research prioritised the most common responses to questions with data patterns, and the primary data from interviews were compared with theoretical and practical concepts to form answers to the research questions.
3.4 Research Quality

For the assessment of accuracy of insights available in this research, we will use Guba and Lincoln (1989) types of quality criteria: credibility (is the work authentic?); transferability (will the work fit outside this situation?); dependability (is the researcher consistent?); and confirmability (are interpretations defensible?).

(1) For the credibility purpose of this research, debriefing sessions were conducted with the thesis supervisor every two weeks. And the study collected and analysed data during a four months internship at Sun-Power from February to June 2019 to engage with employees and examine Sun-Power’s work environment. Monthly meetings with Sun-Power top management were conducted to evaluate the research progress and allowing Sun-Power teams to ask questions and provide feedback about the study.

(2) The research provides contextual background information about Sun-Power and ways to approach Sun-Power issues; this enables users to understand better this research. Even though the results of this study are mainly directed in providing solutions for Sun-Power, readers can still transfer relevant information for their research (transferability).

(3) Dependability of the study is illustrated by written supporting information about the decision made in this research.

(4) The confirmability is essential in every study since it provides the source of the data being interpreted. For instance, including interviewees comments, references to relevant documents and more.

3.5 Research Ethics

The ethical aspect of this research involved a consent meeting, followed by a project start and end email from Sun-Power’s director and owner. Employees provided recorded or email approval to participate in Sun-Power’s research. Every participant was informed about the interview being recorded, and employees were free to withdraw from the study. Interviewees were aware that this thesis might include personal information such as working departments, employees’ roles and comments. The software currently being used by Sun-Power is also kept anonymous as the goal of the research is to analyse Sun-Power’s issues. Including personal information about the software could create ethical problems with the software company. This research was ethically conducted by communicating with participants and delivering what was promised.
Chapter 4 – Results

In this section, we report the significant patterns emerged from our Study. Two main findings are represented in the conceptual diagram: the meaning of time management and quality of services issues in Sun-Power (GAP analysis); The extent to which technology and structure cause “time management” and “quality of services” issues (CAUSE analysis). This research will use the gap and cause analysis results to recommend solutions to attenuate waste of time and amplify the quality of services in Sun-Power.

Fig. 7. An elaborated conceptual model for Sun-Power’s diagnosis

Sun-Power can employ about 80-85% of their 1000 candidates yearly goal. However, the organisation wants to know where the gap exists between Sun-Power’s desired standard of services and the services that Sun-Power is currently offering. Through the Gap analysis, this research will diagnose the difference between the norm values and actual values of the quality of services and time management in Sun-Power. Analysing various gaps in Sun-Power will provide a further understanding of the problematic areas. Moreover, it is important to examine time management and quality of services before evaluating their technological and structural causes.
4.1 GAP Analysis

There are two problematic essential variables identified by Sun-Power’s team: ‘time management’ and ‘quality of services’. This section evaluates the norm and actual values of Sun-Power’s variables to analyse the gap that exists between the organisation’s desired state and the current state.

4.1.1 Time Management

The aim of evaluating Sun-Power time management’s desired and current performances is to investigate whether Sun-Power is able to deliver all services on time when clients request for candidates. Sun-Power works with agriculture and technical clients. Therefore, temporary workers demand radically increases during the busy season from April to July (clients’ harvesting period). April to July is the busy season comparing to the rest of the year. Time management variable is based on the two working seasons for Sun-Power.

4.1.1.1 Services Delivery Time

The processing time for each organisation is different, and Sun-Power’s services delivery time values for the non-busy season are:

1. Norm values

The recruitment process information was shared during interviews and is available in Sun-Power’s documents such as “Procedure handbook”. The procedure handbook does not include the timeframe of each recruitment steps. But the director and owner of Sun-Power mentioned that the company aims to deliver candidates within one to two working days to give Sun-Power enough time to issue legal paperwork. Moreover, it is essential to provide candidates on time or earlier as clients have contacts with other competitive recruitment companies.

2. Actual values

One to two working days is the minimum period to recruit temporary workers, and this is Sun-Power’s constant cycle time throughout the entire year. From August to March, Sun-Power is able to deliver services on time because there is low demand and some clients have prescheduled vacancies as mentioned by one of the sales managers: “long-term clients have constant work”.
Therefore the actual value of the services delivery time is that **Sun-Power can deliver candidates within two working days.**

4.1.1.2 Services Delivery Time during the Busy Season (from April-July)

Sun-Power’s busy season is from April to July. During this period, clients request for new candidates within a short period of about 24 hours because of the rise in workloads or clients are not satisfied with candidates that do not meet the recruitment requirements. Consequently, the production cycle time needs to be shorter to be able to handle multiple demands at the same time. The values of the services delivery time during Sun-Power’s busy season are:

1. *Norm values*

   All the fifteen interviewed employees mentioned that during the busy season, there is a lot of pressure, and some vacancies are not able to be filled. From the analysis of the past year’s company productivity, the managing board agreed that Sun-Power needs a more flexible cycle time that is able to **recruit candidates within 24 hours or less.**

2. *Actual values*

   **Sun-Power has a fixed cycle time of two working days (≥ 24 hours) to deliver services** throughout the year, which doesn’t enable the company to react to multiple jobs quickly during the busy season. Sun-power is not always able to provide services on time, which means that not all available vacancies are filled especially during the busy season. For example, one of the recruiters stated that “sometimes it’s too busy for Sun-Power to recruit the right candidates for all clients’ vacancies on time”.

4.1.1.3 The GAP between the Norm and Actual values of Time Management

A fast-paced industry such as temporary workers recruitment is highly influenced by the amount of time needed to deliver a specific candidate to clients. During the low market demand period, Sun-Power can recruit and provide candidates on time, that is between 1 to 2 working days since most of the clients have long-term contracts and have prescheduled jobs. But, during the busy season from April to July, unexpected job openings are introduced, and candidates’ demand also radically increases; reducing the recruitment cycle time to 24 hours or less. The constant production cycle time (two working days) doesn’t enable Sun-Power to be flexible enough to
deliver candidates that meet client’s requirements during the busy season because employees are wasting time doing administrative work instead of recruiting candidates. Moreover, it is essential to have a short cycle time throughout the year to deliver candidates on time or earlier. A flexible cycle time facilitates candidates’ recruitment within 24 hours or less. And, excellent time management will enable Sun-Power to innovate and grow their yearly target goal of recruiting 1000 candidates.

**GAP Analysis**

**Essential Variable: Time Management**

<table>
<thead>
<tr>
<th>Norm values</th>
<th>Services delivery time</th>
<th>Services delivery time during the busy season (April-July)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GAP</strong></td>
<td>Doesn’t Exist</td>
<td>Exists</td>
</tr>
<tr>
<td>Actual values</td>
<td>Sun-Power can deliver candidates within two working days</td>
<td>Sun-Power has a fixed cycle time of two working days (&gt;24 hours) to deliver services</td>
</tr>
</tbody>
</table>

*Fig.8. The Gap between the Norm and Actual values of Time Management in Sun-Power*

**4.1.2 Quality of Services**

Sun-Power is a recruitment company for temporary workers, and most of the jobs are agriculture and technology-related. For instance picking tomatoes, welding and more. The primary process consists of steps to recruit candidates that match clients’ requirements, and in the process creating ambassador candidates for Sun-Power. Clients provide requirements that define the skills, and the essential information to hire a specific candidate. For example, requirements include candidate’s experience, skills, age, nationality (sometimes), gender and more. The quality of services, which is the degree of services excellence in Sun-Power, can be described by two variables: “clients and candidates’ satisfaction rate” and “rate of filling all vacancies”.

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4.1.2.1 Clients and Candidates’ Satisfaction Rate

The quality of services can be measured by how satisfied clients or candidates are with Sun-Power services. Sun-Power’s vision is to create an honest and respectful work environment together with its customers (clients and candidates) and employees. Therefore, customer’s satisfaction is crucial for Sun-Power’s growth.

- **Clients’ satisfaction rate**

Sun-Power has requirements to recruit candidates, and when the majority of these requirements are met clients are satisfied. For example, requirements are split into many groups: required documents, minimum requirements, language requirements, and so forth. Minimum requirements to recruit temporary workers are represented below.

![Minimum requirements for temps](image)

**Fig.9. Minimum requirements for temporary workers**

*Source: Sun-Power Information guide for recruitment partners – January 2019*

- **Candidates’ satisfaction rate**

Sun-Power aims to recruit candidates that will represent the company’s value. The more candidates are satisfied with their jobs; the better Sun-Power’s quality becomes because candidates are the services that Sun-Power delivers to clients. Sun-Power also offers candidates more services such as payrolling, housing, transportation and more. Candidates satisfaction is achieved by measuring how the job matches candidates’ interest and how comfortable are Sun-Power additional services.
1. Norm values

Sun-Power aims to fill all the clients’ available positions with candidates that will enjoy their responsibilities. Based on the company’s vision and interviews, Sun-Power wants to have 99% of clients satisfied with Sun-Power candidates; and having 99% of candidates satisfied with their jobs and additional services such as accommodations and more. For instance, Sun-Power desires that 9.9 clients or candidates out of 10 should be satisfied with the overall quality of services being delivered by Sun-Power.

2. Actual values

It is known that there is a level of dissatisfaction with the quality of services offered by Sun-Power because it is known that there is a level of dissatisfaction with the quality of services offered by Sun-Power because firstly the director and owner of Sun-Power mentioned that “Sometimes we do not know enough from the candidate in order to put him/her in a place where he/she fits the best, and that’s a quality problem”. Also, candidates are not satisfied with their work when the jobs do not match their skills and preferences. The sales managers mentioned that clients are complaining about candidates with no language skills or job motivations. Sun-Power has difficulties in measuring clients and candidates’ satisfaction rate because the current state of Sun-Power does not have ways to evaluate customer’s perceptions of their services. For instance, Sun-Power’s last overall satisfaction level evaluation meeting was conducted in 2015, and there is no available data collected for feedback purposes. Consequently, this research doesn’t have enough data with insights into the current quality of Sun-Power services. The fact that the quality of Sun-Power’s everyday work cannot be evaluated is a negative indicator connected to the quality of the services itself and future improvements.

4.1.2.2 Rate of Filling all Vacancies

The quality of Sun-Power services is also about the rate to which the company is filling available vacancies. Clients rely on Sun-Power to deliver the right candidates, and candidates depend on Sun-Power to provide satisfactory jobs. The market demand for temporary workers is increasing, and creating a high number of vacancies. And, Sun-Power has an internal goal to recruit about 1000 candidates yearly based on previous years’ demands.
1. **Norm values**

*Sun-Power aims to recruit candidates for 99% of all client’s vacancies* because it is not possible to reach 100% results since there are always internal and external disturbances within an organisation. There are many vacancies that Sun-Power receives yearly, and the organisation wants to be flexible enough to fill 9.9/10 of all clients’ job offers.

2. **Actual values**

A recruitment company degree of excellence of their services also depends on their ability to deliver needed candidates. This research identified issues with the current quality of services because *Sun-Power is only able to recruit about 80-85% of their yearly goal (recruiting 1000 candidates).* There is an increase in the demand for temporary workers mostly from April to July (busy season), and Sun-Power is not flexible enough to conduct quick recruitments. For instance, the director and owner of Sun-Power mentioned that “during the busy season, clients contact many recruitment companies and mostly go with the one that can deliver candidates first”. Sun-Power being able to fill all clients vacancies can create a stronger relationship and reputation between Sun-Power and their customers..

4.1.2.3 **The GAP between the Norm and Actual values of Quality of Services**

There is a gap in the quality of services being offered by Sun-Power because not all recruitment requirements to provide the top candidates to the right clients are met. One of Sun-Power’s employees stated that “We have the recruitment guideline with the minimum requirements, but sometimes we cannot meet all the requirements”. For instance, it is clearly stated in the ‘minimum requirements for temporary workers’ in fig.9 from page 28 that Sun-Power needs a minimum of 20% of candidates that can legally drive and are willing to drive because some clients’ locations are 10 kilometres away from Sun-Power’s accommodations. Hence, having less than 20% of candidates that can legally drive and willing to drive will affect this requirement and the quality of services as Sun-Power will fall short of drivers. The fact that Sun-Power does not have ways to evaluate customer’s perceptions of their services (feedback) negatively impact the quality of the services itself and future improvements.

Additionally, Sun-Power has a goal to recruit about 1000 candidates yearly based on previous years’ demands. However, in the past few years, Sun-Power has been experiencing time
management and quality issues. This means that Sun-Power’s yearly recruitment goals can be expended to fill 99% of all clients’ vacancies. But currently, Sun-Power can only fill approximately 80-85% of their yearly recruitment goal of 1000 candidates. Sun-power is facing a 14-19% gap to meet their yearly goal. The quality issues also occur because there are no ways to determine whether clients or candidates are satisfied, even though Sun-Power can deliver temporary workers to clients. The lack of clarity about the satisfaction level means that some vacancies are being filled for the sake of meeting the market demand, regardless of the poor quality of services.

**GAP Analysis**

**Essential Variable: Quality of Services**

<table>
<thead>
<tr>
<th>Clients and Candidates' satisfaction rate</th>
<th>Rate of filling all vacancies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Norm values</strong></td>
<td></td>
</tr>
<tr>
<td>Sun-Power wants to have 99% of clients satisfied with Sun-Power candidates &amp; having 99% of candidates satisfied with their jobs and additional services such as accommodations and more</td>
<td>Sun-Power aims to recruit candidates for 99% of all client’s vacancies</td>
</tr>
<tr>
<td><strong>GAP</strong></td>
<td></td>
</tr>
<tr>
<td>Exists</td>
<td>Exists</td>
</tr>
<tr>
<td><strong>Actual values</strong></td>
<td></td>
</tr>
<tr>
<td>It is known that there is a level of dissatisfaction with the quality of services offered by Sun-Power</td>
<td>Sun-Power is only able to recruit about 80-85% of their yearly goal (recruiting 1000 candidates)</td>
</tr>
</tbody>
</table>

*Fig.10. The Gap between the Norm and Actual values of Quality of Services in Sun-Power*

The fundamental process of the gap analysis is to compare the current services delivery time and quality of services in Sun-Power with the desired values of the overall organisation. The result from the GAP analysis will be used to perform a CAUSE analysis in the next section.
4.2 CAUSE Analysis

In the previous section, we introduced the gap analysis that described the problematic organisational behaviour in Sun-Power. We now know that Sun-Power is facing both ‘quality of services’ and ‘time management’ issues. The cause analysis will further elaborate on the causes of these problems using parameters that capture relevant characteristics of organisational structures and technology. Lekkerkerk (2017) mentioned that companies must adapt to the threats and challenges in the market, and Sun-Power wants to be able to adjust to the changing environment by conducting the diagnosis of the current state of the organisation. This research used both the top-down and bottom-up research approach to analyse values of the current problematic behaviours in Sun-Power. The bottom-up approach was used for technological parameters by matching of Sun-Power IT issues with IT theories. And, the research also mainly used De’ sitter’s parameters and other supporting theories to analyse the level to which organisational structure is affecting time management and the quality of services in Sun-Power. The evaluation of Sun-Power’s structure used the top-down approach that assesses first existing structural theories and connects them to Sun-Power’s issues. It is essential to compare the norm values of the parameters with the current situation in Sun-Power to understand the causes of time management and quality of services.

4.2.1 Technological Parameters

IT parameters are related to the main software used by Sun-Power in the front-end (candidate recruitment) and the back-end (payrolling); also, how the organisation interacts with IT functionalities. Based on the software quality requirements, Sun-Power IT parameters values will determine to what extent technology is affecting time management and the quality of services within the organisation. This research is analysing technological parameters because of IT problems mentioned during interviews and details from the observation data. For instance, the operations manager commented that “details from the website have to be manually typed in the company’s main software because there is no connection between the two systems”. And, the fifteen interviewed employees of Sun-Power also shared their unpleasant experience with the current software. Therefore, this study will explain and provide IT causes of time management and quality issues in Sun-Power using Kontio & Conradi (2002) quality model measurable factors.
4.2.1.1 Functionality

Software functionality is about the system’s ability to deliver what it is intended to do. The functionality of Sun-Power’s software is about the level of the system’s customisation that could be high, average or low. Software functionality brings value to the organisation’s primary goal (Kontio & Conradi, 2002). Therefore, it is necessary to compare the desired and current features of Sun-Power’s software.

1. Norm values

**Sun-Power aims to have an average level of the system customisation** where employees can recruit, plan, create invoices, and manage tasks using one software. The reason why Sun-Power desires an average level of personalisation is that the managing board of Sun-Power evaluated the company’s needs and revenues, and they decided not to build a fully customised system just for Sun-Power. But Sun-Power desires a software company that can make minimum changes about the features that impact Sun-Power the most.

2. Actual values

The main goal of the system is to function well to be able to facilitate tasks in a company. However, Sun-Power’s current system is not able to meet all the company’s needs. For instance, one of the recruiters mentioned that “When the recruiter is searching for a keyword such as ‘tomato workers’ the search presents all relevant and non-relevant candidates with experiences in picking tomatoes. Consequently, recruiters spend extra time contacting candidates that are not interested because the job doesn’t match with their experiences. Also lacking a good filtering feature in the retrieval system is a time-waster for employees because the software retrieves about 40 candidates (relevant and non-relevant) as a result of only one match. And employees have to filter matched candidates in an external excel sheet manually.

**Sun-Power’s software is delivering a low-level system customisation**, and the main feature that is currently affecting Sun-Power the most is the “matching feature”. Sun-Power’s software is not able to make smart matches because the system is built in the format of basic manual checklists that requires a lot of time and have higher chances for mistakes to occur. When employees forget to check one box, then the output becomes incorrect. Moreover, the current software company is not willing to make changes to facilitate tasks in Sun-Power.
3. The gap between parameters

The main functionality of a system needs to match with the company’s goals to transform input into output. Systems are designed to facilitate tasks in the organisation that’s why the low functionality of Sun-Power’s current software means that the software is not fully built for a recruitment company. Sun-Power’s software is not able to deliver some important features such as candidates matching, integrated planning and more. Therefore, the system cannot achieve what it is intended to do; which is causing employees to waste time in performing poor quality tasks based on their personal understanding. Sun-Power does not have standard quality measurements for output. For example, the planner plans manually, and other employees cannot exactly reproduce what he does because the system does not have a standard way to allocate rooms or transportation to candidates. The investigation of Sun-Power’s software demonstrates a gap between the desired and the actual values of the software functionality.

4.2.1.2 Usability

The software usability for Sun-Power is about “user-friendliness” of the user interface, the communication means and more. The premise behind software user-friendliness is that almost all systems require some knowledge on the part of the user; those in which the amount of knowledge is presumed to be minimal (Meyer & Harper, 1984). Bevan (1995) discusses the three factors that will be used in this research to measure usability in an organisation: usability effectiveness (whether users can achieve their goals using the software), usability efficiency (how much effort is needed from users to achieve Sun-Power’s goal) and satisfaction (how happy are the users with the system). Usability factors will have high, average or low values in Sun-Power.

1. Norm values

Sun-power desires a system that employees can get familiar with quickly or a system with high usability effectiveness, efficiency and satisfaction.

- High software “usability effectiveness” is related to the goal of using the system; the accuracy and completeness with which Sun-Power’s goals can be achieved. For example, Sun-Power desires a system that can conduct accurate matches using advanced retrieval models to recruit the right candidates for clients.
• **High software “usability efficiency”** is related to Sun-Power’s software that requires less resource. Resources could be mental or physical efforts needed to interact with the software to recruit candidates. For instance, Sun-Power desires a system that requires less manipulation time.

• **High software “usability satisfaction”** is about comfort and acceptability of the software use. Comfort refers to the overall physiological or emotional response to the use of the system (Bevan, 1995). And acceptability is about the general attitude towards the system. Sun-Power desires a system with high satisfaction, where users feel that the system is helpful and easy to learn.

2. **Actual values**

*Sun-Power’s software usability effectiveness, efficiency and satisfaction values are low,* and this section will describe the current state of the system’s user-friendliness.

• There is an **average software “usability effectiveness”** because the current system in Sun-Power works well for the back-office tasks as mentioned by the payrolling employee: “I have worked with other systems in the past. If I look back, I think Sun-Power’s system is better.” And, the junior financial controller also supported this comment by stating that the system is currently providing the required output for the back-office. However, the software doesn’t work well for the front-office (recruitment and planning tasks). From the observation of how the system functions during the internship, we noticed that the system does not give employees the requested results. For example, when recruiters are searching for candidates with experience in ‘welding’ or ‘tomatoes’, the system provides 40 results, including relevant and non-relevant candidates. Unfortunately, the current system is not designed to meet Sun-Power’s goal of using the software.

• **Low software “usability efficiency”**: The ability to get familiar with the features of the current software is low because the software settings are complicated, and some employees have to write down the action steps they take to interact with the software. Consequently, Sun-Power wastes time, which is one of the most valuable resources of the company. For instance, it takes about one hour to add the data of only one candidate in the system without matching. Users have to do multiple manual tasks to perform daily work with no reporting,
or data analysis features to automatically evaluate tasks progress and analyse where time is being wasted.

- Low software “usability satisfaction” means that employees who interact with the software daily are not happy with the way the software is currently functioning. All the fifteen interviewees mentioned that they were not fully satisfied with the way the current system is working. For instance, a recruiter said she was not pleased with the software matching techniques. Another employee also stated that she disliked the fact that the system keeps its doors locked and it doesn’t share data with other systems and so forth.

3. The gap between parameters

Software usability is affecting essential variables in Sun-Power because employees interact with the software daily to achieve Sun-Power’s goals. System usability is important because it affects how employees carry out their tasks and thus affects Sun-Power’s services.

Characteristics of low software usability:

- Doesn’t support the way employees carry out their tasks and the company’s goal, which affects the quality of services.
- Employees do not feel in command of the system and waste a lot of time conducting manual works.
- The system is not helpful and easy for Sun-Power employees to learn.

4.2.1.3 Efficiency

Software efficiency in Sun-Power is about the software’s speed that can have values high or low. The primary process of Sun-Power involves continuous use of the software. Thus, we will discuss the values of Sun-Power’s system speed, such as the time it takes to process input, also called ‘response time’.

1. Norm values

Sun-Power desires a system highly efficient and able to load results quickly. High speed for Sun-Power means a response time of 3-5 seconds. The faster the system, the quicker the employees can recruit candidates.
2. Actual values

**Sun-Power has low software efficiency** that is wasting employees time and increases the cycle time to recruit a specific candidate. For example, matching a candidate to a client is a process that can be automatically performed under five seconds because the system already has clients and candidates’ information. But, Sun-Power’s system is currently taking about 10 to 15 minutes to display the right match but still including duplicated data. The software uses the checklist setting, that’s why when employees forget to check one box, then the result is incorrect, and users need to start the process again.

3. The gap between parameters

The system efficiency has a gap between the software’s desired and actual values. Software speed can characterise the system; that’s why Sun-Power’s slow system will affect the organisation’s time management. Moreover, the more employees waste time operating the system, the more their focus is turned toward the use of the software instead of the quality of services being generated.

4.2.1.4 Reliability

Software reliability is a part of the factors defining Sun-Power’s system, and can be described as quality error or human mistakes that cause the system not to work as expected. The system values are measured in term of levels of reliability: high-level, minimum-level and low-level reliability.

1. Norm values

It is nearly impossible for a system to be perfect because it can still be affected by internal and external factors. Sun-Power desires a system that has high-level reliability or minimum level of software errors that allows Sun-Power to perform crucial recruitment tasks.

2. Actual values

**Sun-Power’s software has low-level system reliability** because the system’s errors are affecting the main tasks of Sun-Power’s primary process. For example, the software supplier omitting and not willing to develop some features, such as, system automation and software compatibility to share data with other systems negatively impact Sun-Power. Information is
essential for Sun-Power as tasks are performed in steps by different departments. For instance, the planner stated: “I have to type the same information in 3 different software for other teams to be updated about my work”; this is a waste of time for fast-paced recruitments.

3. The gap between parameters

The lack of integration between Sun-Power’s system and the other software that add value to Sun-Power such as planning, reporting, Sun-Power’s website creates a gap between the desired and actual values of the software reliability. Software reliability affects Sun-Power time management as employees waste more time sharing, accessing and storing data instead of recruiting candidates.

**Technological Parameters overview:** Software design can impact the quality of the output and how time is managed in an organisation. In this case, Sun-Power is facing time management and quality of services problems because the current system has poor quality in terms of software functionality, usability, efficiency and reliability.

![Fig.11. Technological parameters – gap between the norm & actual values](image)

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4.2.2 Structural Parameters

The analysis of structural causes of Sun-Power issues will break down the potential structural sources of the problems. An organisational structure is the division of work or a network of related tasks (Achterbergh & Vriens, 2010). Tasks in Sun-Power is acquiring clients, recruiting candidates, planning for candidate’s accommodations, creating invoices and more. And as discussed in previous sections, organisational structures should have the capacity to attenuate disturbances and amplify regulatory potential. Out of De sitter’s seven parameters, the level of specialisation of operational transformations will be discussed in this research, as it affects Sun-Power the most.

1. Norm values

Sun-Power’s structure requires a low level of specialisation of operational transformations to attenuate disturbances and amplify the quality of services. The goal is to have a simple structure where tasks flow smoothly. Low level of specialisation of operational transformations will enable Sun-Power to have:

- **Minimum disturbances**: even though companies will always face unexpected internal and external disturbances, Sun-Power wants to be able to perform necessary tasks to meet their goals.
- **Quick to react to disturbances**: When employees have an overview of what they need to do as an organisation, it becomes easier to detect and respond to issues.
- **Balanced production cycle time**: When tasks are simple, and employees can deal with disturbances immediately, then work is executed on time to deliver services to customers. Moreover, a balanced production cycle time is flexible and reduces working pressure.
- **Minimum communication & supervision**: A structure where employees know what they have to do with minimum disturbances will decrease the level of communication and control because teams trust each other to perform excellent tasks.
2. Actual values

Sun-Power is continuously dividing tasks as the company grows. For example, in Sun-Power the operational transformation ‘recruiting candidates’ is specialised and decomposed into smaller sub-transformations ‘Matching’, ‘Follow-up’, ‘Job advertisement’, and ‘Database update’; and each of these transformations is a separate task accomplished by an individual front-office employee.

Fig. 12. Sun-Power Recruiting team task division infrastructure

All the interviewed employees mentioned that Sun-Power tasks need a high level of communication within departments because functions are interrelated and connected. For example, sometimes account managers have to be involved in the recruitment process when recruiters are not aware of all the details required to recruit a candidate. And recruiters have to continually communicate with the intercedent team as they work on the same tasks split into different groups. Therefore, the level of specialisation of operational transformations has a high value in Sun-Power, causing:

- Extra disturbances: e.g. Sales managers have to deal with both sales and recruitment issues because they also recruit technical candidates.
- Difficulty to react to disturbances: The more tasks are distributed; the more disturbances occur, and it becomes harder to respond to issues. For instance, if a recruiter is not happy with the quality of the candidates’ details being added in the
database by the intercedent team, then the teams will have to meet and find a way to make changes. Because the issues involve many individuals doing almost the same tasks, it becomes difficult to react faster about problems.

- **Increase in the production cycle time:** The network is complex, and if disturbances are not dealt with immediately, they tend to affect other tasks which will require more time to be fixed. That’s why Sun-Power is not able to cover all the job openings during the busy season. For example, the issue of the system taking 1 hour to register one candidate is affecting time management in Sun-Power; and when there is more demand, employees cannot manage to fill all vacancies (quality of services problem).

- **High working pressure:** High values of the structural parameters cause an increase in working pressure with some individuals as their workload increases.

- **Increase in communication & Continuous supervision:** The system complexity leads to disturbances and teams have more interaction than needed. For instance, because tasks are connected with no system overview, then departments have to communicate about each task continuously; which negatively impacts the team’s effectiveness.

3. **The gap between parameters**

The main goal of this cause analysis was to examine structural parameters and their impacts on the essential variables (time management and quality of services). The result from the CAUSE analysis shows a gap between the desired and actual values of the level of specialisation of operational transformations in Sun-Power. Sun-Power needs to be aware of the consequences of multiple division of tasks as it is currently affecting time management due to an increase in communication and supervision in Sun-Power. Also, Sun-Power’s recruitment cycle time keeps increasing due to unsolved issues (more time required to perform tasks). Moreover, the current structure also impacts the quality of services because the structure becomes complex and employees cannot deliver all the orders (rate of filling all vacancies). And, Sun-Power faces difficulties to react to disruptions that need to be removed to improve the quality of services.
**Structural Parameters overview:** Sun-Power’s structure is also playing a significant role in causing time management and quality of services issues. The organisational structure needs to be analysed before making any changes. By understanding their structure, Sun-Power can make decisions that will both attenuate disturbances and amplify regulatory potential.

![Diagram of Structural Parameters](image)

*Fig. 13. Structural parameters – gap between the norm & actual values*
4.3. Parameters’ Influence

The raw data collected from multiple interviews and observations in Sun-Power, including academic studies, confirm that technological and structural parameters cause time management and quality of services issues. The graph below represents the impact level of parameters. Sun-Power needs to deal first with high impact parameters or parameters causing low time management and quality of services problems.

![Graph showing parameters impact on time management and quality of services]

**Fig.14. Sun-Power parameters impact on Time management & Quality of services**

However, it doesn’t mean that parameters that do not profoundly affect Sun-Power should be ignored. Because once the most impactful limitations are attenuated, the less impactful will also be weakened as parameters are interrelated.
Boehm et al. (1976) state that the desirable qualities of a software product vary with the needs and priorities of the prospective user. Sun-Power’s main priority is conducting all the tasks involved in matching candidates with clients more efficiently. The current system is not performing Sun-Power tasks well, which is causing a lot of manual works that leads to time waste and quality issues. It is evident that Sun-Power’s software works okay, but it’s not fully meeting Sun-Power’s needs. The software is not connecting with other software; it’s not able to deliver what Sun-Power desires; it’s not user-friendly and has a low-speed which also increases time waste in accomplishing tasks and decreases focus on the quality of services.

A simple task that needs 20 minutes of the employees’ time is now taking 1 hour to register one candidate’s details in the system. The complexity of the system increases the production cycle time and puts more pressure on Sun-Power’s structure. The organisation divides tasks into multiple sub-tasks to decrease complexity; but adding more relations within tasks augments relationships between sub-transformations, leading to a higher probability of disturbances (Achterbergh & Vriens, 2010). The more interdependent tasks are divided and performed by different individuals, the more the communication level increases, creating extra disturbances and more work pressure. Consequently, the production cycle time will increase due to time management and quality of services issues in Sun-Power. And, when the market demand increases, especially during the busy season, Sun-Power faces an inertia state where there is no time to register more candidates because the production cycle is too long and complicated.

As described in this chapter, both technological and structural parameters are currently affecting time management and quality of services in Sun-Power. Sun-Power employees are not recruiting the right candidates on time because the system is not well designed for recruitment purposes. Therefore, employees are wasting more time trying to make the software work, communicating and sharing data, leaving no time to focus on the quality of services. Moreover, the complexity of Sun-Power’s structure also creates extra disturbances that increase the recruitment cycle time. Thus, Sun-Power is not able to fill all clients’ vacancies.
Chapter 5 – Conclusion and Recommendations

The final chapter of this study consists of three parts. First, a summary of the research objectives; second, different limitations observed in this study; lastly, practical recommendations as a direct result of the research and further work that can supplement this study. This research aimed to answer the research questions:

(1) What exactly are Sun-Power’s problems with the quality of services and time management?

(2) To what extent do the structural and technological parameters cause time management and quality of services issues in Sun-Power?

To answer these two questions (and to arrive at recommendations), we created a conceptual model to facilitate the evaluation of the meaning of time management and quality of services in Sun-Power through the GAP analysis. And we examined the extent to which technological and structural parameters can impact time management and quality of services in Sun-Power through the CAUSE analysis.

The gap analysis evaluated the meaning of time management and quality of services for Sun-Power. The conceptual model section describes time Management in Sun-Power as the “services delivery time” and “services delivery time during the busy season (April-July)”; and the Quality of Services is about “clients and candidates’ satisfaction rate” and “rate of filling all vacancies”.

The findings from interviews, observations and academic studies data show that candidates’ demand radically increases during the busy season from April to July (clients’ harvesting period). Sun-Power is facing a gap in the values of time management mostly during the busy season because clients require candidates within 24 hours or less (norm value), but Sun-Power has a constant recruitment cycle time of two working days (actual value). Therefore, it is essential to have a short cycle time throughout the year to deliver candidates on time or earlier. A flexible cycle time facilitates candidates’ recruitment within 24 hours or less. And, excellent time management will enable Sun-Power to innovate and grow their yearly target goal of recruiting 1000 candidates.
The research data also shows that Sun-Power quality of services’ norm values is achieving 99% of customer’s (clients and candidates) satisfaction rate, and being able to fill 99% of the yearly candidates’ recruitment goal (1000 candidates). However, Sun-Power is facing customer’s dissatisfaction as customers complain about candidates not meeting the recruitment requirements or candidates with no job motivation. Also, candidates are not satisfied with their work when the job doesn’t match their skills or preferences. Clients and candidates’ dissatisfaction rate cannot be measured because there was no feedback data collected from clients and candidates. Nevertheless, the interview data confirms that clients and candidates are not fully satisfied with Sun-Power’s current services. Sun-Power has a goal to recruit about 1000 candidates yearly based on previous years’ demands. And, in the past few years, Sun-Power has been experiencing time management and quality issues. This means that Sun-Power’s yearly recruitment goals can be expended to fill 99% of all clients’ vacancies. But currently, Sun-Power can only fill approximately 80-85% of their yearly recruitment goal of 1000 candidates. Sun-power is facing a 14-19% gap to meet their annual goal. The quality issues also occur because vacancies are being filled without examining whether they meet customers’ need, which displays a poor quality of services.

The cause analysis investigated IT parameters related to the main software used by Sun-Power in the front-end (candidate recruitment) and the back-end (payrolling). And structural parameters are associated with Sun-Power’s division of work or a network of related tasks. The result section of this research elaborates in details how both technological and structural parameters cause time management and quality of services issues in Sun-Power.

The analysis focuses on the software quality affecting Sun-Power because the main software functionalities do not fully match with Sun-Power’s recruitment goals. The software usability doesn’t support the way employees carry out their tasks, and the system is not helpful and easy for Sun-Power employees to learn. The efficiency of Sun-Power’s software speed is low. Moreover, Sun-Power’s system is not reliable as employees waste more time sharing, accessing and storing data instead of recruiting candidates. Sun-Power software reliability parameter only causes time management issues, but the software functionality, usability, and efficiency affect both time management and quality of services in Sun-Power.
This research examined Sun-Power’s structure using De sitter’s design theory. The result from the CAUSE analysis shows that there is a gap between the desired and actual values of the level of specialisation of operational transformations in Sun-Power’s structure. When the multiple division of tasks increases, then the level of specialisation of operational transformations has a high value and creates complex tasks. Sun-Power needs to be aware of the consequences of multiple division of tasks as it is currently affecting time management due to an increase in communication and supervision in Sun-Power. Also, Sun-Power’s recruitment cycle time keeps increasing due to unsolved issues (more time required to perform tasks). The current structure impacts the quality of services because the structure becomes complex and employees cannot deliver all the orders (rate of filling all vacancies). And, Sun-Power faces difficulties to react to disruptions that need to be removed to improve the quality of services.

Overall the objectives to diagnose Sun-Power through a GAP and CAUSE analysis was met. And this research enables Sun-Power to understand the time management and quality of services issues, as well as their IT and structure related causes. As a result of this thesis, software recommendations are provided to improve the current software quality. And this study provides structural recommendations to lower the values of the level of specialisation of operational transformations in Sun-Power.

5.1 Limitations of the Research

This section will discuss the limitations observed in this study. The first limitation is about not generalising the result of this study to the entire recruitment market because this thesis focused on analysing only Sun-Power’s issues and their causes. However, readers can still transfer relevant information from this study for their future research. The second limitation is about the limited time to finish this thesis, which didn’t enable the researcher to collect more data by interviewing clients and candidates. The last limitation is about changes in Sun-Power’s structure. During the four-months internship, many tasks were interchanged within departments and employees. Also, Sun-Power hired three employees. The changes in the structure during the research period could negatively impact the dependability of this study. However, we scheduled and rescheduled more interviews to guarantee the reliability and accuracy of the initial information given before structural changes.
5.2 Practical Recommendations

Sun-Power can develop the current state of the organisation by integrating new software and reducing the value of the level of specialisation of operational transformations. This section provides technological, structural and research recommendations to help Sun-Power integrate changes for future improvements.

5.1.1 Technological Parameters Recommendations

5.1.1.1 Software Requirements

Sun-Power’s current software company is not willing to make changes to meet Sun-Power’s needs. Therefore, this research provided software requirements that Sun-Power can present to software companies to build and integrate a new system that can solve about 65-80% of Sun-Power’s issues. The forty-nine requirements are grouped into “Must have”, “Should have”, “Could have” and “Nice to have” based on parameters impacts. All the technological parameters affect Sun-Power’s primary process. However, settings that have more impact on time management and quality of services issues are labelled “Must have”. “Must have” features have the highest priorities followed by “Should have”, “Could have” and finally “Nice to have”. An example of a software requirement:

Sun-Power Software Requirements

<table>
<thead>
<tr>
<th>Priorities</th>
<th>Must have</th>
<th>Should have</th>
<th>Could have</th>
<th>Nice to have</th>
</tr>
</thead>
</table>

1. **Unified system**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Must have</th>
</tr>
</thead>
<tbody>
<tr>
<td>If an action is performed in the system by one employee, for instance, “create the contract of a candidate”</td>
<td></td>
</tr>
<tr>
<td>Then the system should automatically share the action with the entire system (created candidates’ details should be added in all the departments)</td>
<td></td>
</tr>
<tr>
<td>And the system should provide the history log of every performed action based on departments</td>
<td></td>
</tr>
</tbody>
</table>

| Applicable roles | |
|------------------| |
| Employees | |
| Clients | |
| Candidates | |

| Definition of done | |
|------------------| |
| When all added data, changes or modifications are performed in the system, instant notifications should be sent to Sun-Power employees | |

*Fig.15. Example of one of Sun-Power’s software requirements*
5.1.1.2 Software Quality Assessment

As this research recommended Sun-Power to acquire a new system, the company needs to be able to evaluate the quality of the new software. Sun-Power employees are not developers to be able to measure software quality using code-level criteria. Therefore, this research recommended Denning (2016) six easy levels that users can use to assess software quality. Sun-Power employees can use the six levels to evaluate future software quality.

![Six User Levels of Software Quality Assessments](image)

**Fig.16. Six user levels of software quality assessment**

*Source: (Denning, 2016)*

- **Level -1:** This level requires Sun-Power to evaluate reasons to trust specific software before implementation.
- **Level 0:** When Sun-Power decides to choose a software, this level will help the company to determine requirements boundaries to incorporate a particular software (forty-nine software requirements provided as part of this research).
- **Level 1:** This level is the evaluation of the software’s fundamental integrity to deliver all the promised deliverables.
- **Level 2:** This level is about the users’ assessment of the software fit to the working environment. In this case, it is the evaluation of whether the software aligns with Sun-Power’s primary process. For example, the ability of the software to perform accurate recruitment matching, generating invoices and the planning feature. Users need to
experience that the software can improve their ability to get work done and to carry out essential tasks (software testing by employees from each department).

- Level 3: This level is about the ability of the software suppliers to work closely with Sun-Power after software delivery to modify some features when required (can be added in the contract between Sun-Power and the software supplier).

- Level 4: At this level, the product goes well beyond the user’s expectations, and the user promotes it among others. However, few software systems have produced genuine delight.

The six user levels of software quality will enable Sun-Power to evaluate the overall quality of future software. The software needs to be able to meet Sun-Power’s recruitment needs to help employees recruit the right candidates for clients and deliver high-quality services for end-users.

5.1.2 Structural Parameters Recommendations

Sun-Power aims to reduce values of the level of specialisation of operational transformations to have a simple task flow. In practice, recruiting candidates often requires a large number of activities; and one department cannot cover the entire production flow. Therefore, Sun-Power needs to assign different types of work to various departments. For instance, Recruitment and Sales teams should not become similar and highly dependent on each other. But, in each department, workers need to be able to carry out all necessary activities as ‘self-contained tasks’ to reduce the number of relations in the network of tasks. The goal is to have activities that depend minimally on other departments but may have a high internal dependency. Therefore, Sun-Power employees will be able to perform high-quality tasks in the form of steps.

Acquiring a new software that will meet Sun-Power’s needs will make the company more flexible. The flexibility to deliver the right candidates on time can be achieved because of a simple operational structure and a good system. Accordingly, Sun-Power could have a more reliable production process to fill all client’s vacancies and to meet Sun-Power’s needs. Clients and candidates would also be satisfied with the services as Sun-Power will have time to innovate and respond to customers’ feedback. Moreover, it is crucial for Sun-Power to continuously evaluate the overall organisation to reduce the number of internal and external disturbances.
5.1.3 Further Work Recommendations

This research provided requirements that can be used to acquire a system that meets most of Sun-Power’s needs. Future research could compare Sun-Power’s software requirements with existing software in the market to find features and retrieval models that match the company’s needs. Moreover, employees play an important role in interacting with the software in Sun-Power. Most employees are used to interact with the software in their own ways as the current software requires a lot of manual works. Before integrating a new system, Sun-Power could analyse employees’ impact and willingness to interact with the software to evaluate types of training required.

Furthermore, this research focused on the “quality of organisation” variable in Sun-Power as it is relevant to the current state of the organisation. But future studies could also analyse the other two De Sitter’s essential variables: quality of work and the quality of working relations. Further research will help Sun-Power to have a broader view of the organisation.
References


