

COSMETIC STORE MANAGEMENT

SALESFORCE NAAN MUDHALVAN

PROJECT REPORT

Submitted By

SRI DURGANANDHINI G(611420104078)

VANITHA R (611420104089)

VIDHYA S (611420104093)

VARSHA S (611420104090)

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TIRUCHENGODE,NAMAKKAL-

637205

1. Introduction

In this first chapter, the research area is presented. This is done via initially introducing an overlaying background to the research problem, followed by a problem discussion, which finally results in the purpose of the study as well as the research question. Lastly, a target audience is specified.

1.1 Background

As a result of the increasingly ubiquitous world we reside in, billions of devices contribute with endless streams of information every day. As a consequence, today's globalized business environment of is vastly influenced by the importance of implementing efficient and competitive technological solutions. Typically, these technological solutions have had the purpose of managing the streams of information in order to control and understand them, for example by turning raw streams of data into useful information that can be used for decision making within the organizations. This is achieved via, for example, implementing Information Systems (IS) within organizations, which provides business analysts with assayable information (Hoffer, George & Valachich, 2014).

However, the rapid pace of technological advancement has introduced a new kind of technological solution to the market; solutions that utilizes Artificial Intelligence (AI). AI is a vast and rather obscure subject that many individuals have a hard time to grasp, yet its importance for future business competitiveness is essential, and a growing number of businesses are faced with the challenge of developing and implementing AI solutions (Ghosh, 2018). AI solutions (or AI-enabled applications and systems) can briefly be described as machines (i.e. systems) that learn from experience, adjusts to new inputs, is able to make predictions and perform human-like tasks. This is achieved via Machine Learning (ML), which is a subset of AI that can be described as an automation of the analytical process, i.e. that the system can learn from the data, identify patterns and make decisions with minimal or no human intervention. In order for ML to perform such tasks, it uses Deep Learning (DL), which is a subset or type of ML that focuses on training the computer to learn on its own (Russell & Norvig, 2010).

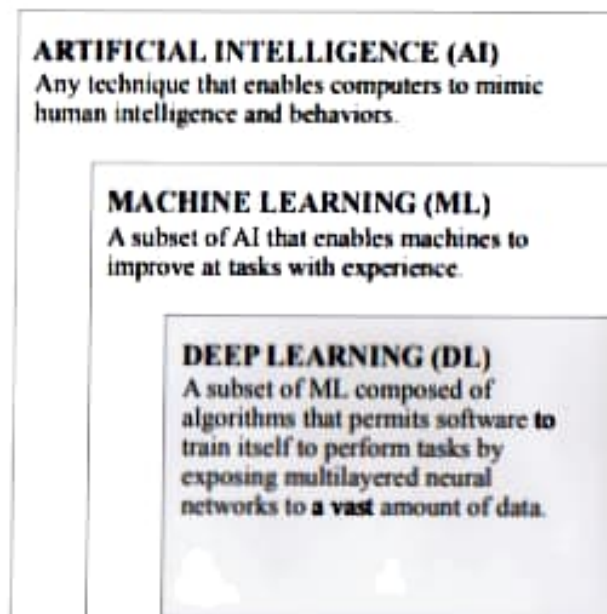


Fig. 1. An illustration visualizing the relation between AI, ML and DL (Russell & Norvig, 2010).

AI solutions are already adopted primarily within logistics, retail management, government surveillance and manufacturing assets management. AI is forecasted to penetrate more business processes in the future and it is estimated to become an increasingly important key feature in all future business models. In short; AI is expected to be present in everything digital (Ghosh, 2018).

However, the development of any variety of information systems is not an easy task; particularly not AI solutions. In order for organizations to develop any kind of system, a standard set of steps, called a systems development methodology, is used for support and development. A widely established methodology used to describe this process is the systems development life cycle (SDLC). It features several phases that mark the progress of the system- and analysis design effort. It is common that the amount of identifiable phases varies in the SDLC based on the authors perception of the methodology, but the general content, direction and ultimate goal is the same. However, despite the variation in phases, a widely recognized-, always included- and critical phase is the requirements analysis (RA) phase. In any systems development project, the RA is described as the foundation on which the success or failure of the project relies on (Hoffer, George & Valachich, 2014).

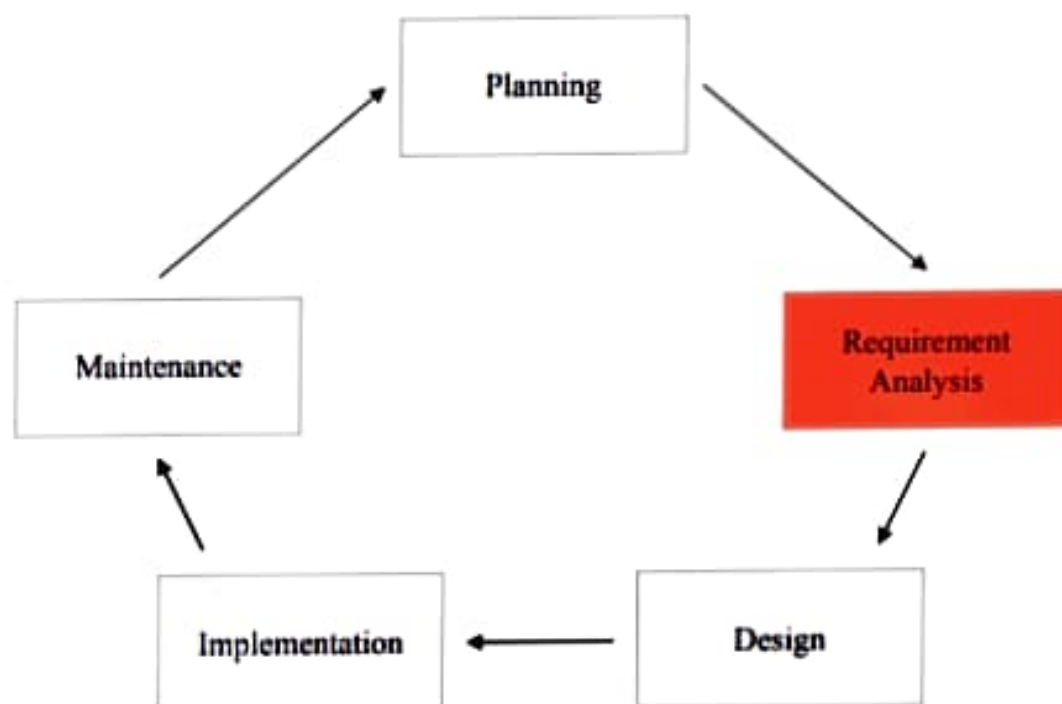


Fig. 2. An illustration visualizing the SDLC as described by Hoffer, George & Valachich (2014).

The SDLC visualized above is used to illustrate where the requirements analysis process is located in the SDLC. The goal of the RA is to determine what functions (i.e. requirements) the new system should inhabit. A requirement can be defined as a desirable function within the system. It might for example be functions that arose from an organizations desire to deal with problems in current procedures more efficiently or a desire for a system to perform additional tasks. Hence, during the RA, analysts work close together with the users to determine what the users want and need from the new system. The final step of the RA is to analyze interrelationships between the requirements in order to avoid redundancies (Hoffer, George & Valachich, 2014).

A poorly performed RA is often the greatest contributor to a failed project. If requirements are not well documented and set up in an efficient way, the final system will not inhabit the qualities needed from its users. Some of the consequences might be, for example, that the system development will be delayed, which in turn will make the whole project exceed the budget drastically. Furthermore, because of misjudged functional qualities, the system may risk to not perform and deliver in a satisfactory way for its users, which will lead to dissatisfaction (Eriksson, 2008).

1.2 Research Problem

Artificial Intelligence as a subject can be relatively difficult to grasp. With extensive increase in usage, interest and development of AI, numerous questions and potential dilemmas appears (Stone et al., 2016). One element in the subject of AI which is not well researched is the process of developing and implementing it as a solution into the corporate world. As with any systems development project, these AI solutions must follow a set of standardized systems development phases, such as the SDLC. This rises questions regarding how the development and implementations of AI solutions should be executed.

According to statistics in the CHAOS report from 2015, 29% of all software development projects were completed successfully, 19% were cancelled completely while 52% of projects were late and over budget. When determining the major contributors to successful projects, investments on user involvement (i.e. the part where requirements are determined by the users) was ranked in a shared first place (Hastie & Wojewoda, 2015). The statistics match theoretical assumptions on the importance of RA. For example, Eriksson (2008) describes that the cost of fixing a certain problem rises tenfold for each step in the SDLC process. A problem that costs 1000 USD to fix in the requirements phase will cost 10 000 USD in the design phase and 100 000 USD in the implementation phase, etc. Hence, It is widely recognized that the requirements analysis is a difficult yet acutely important phase for the success of any systems development project (Chakraborty, Kanti Baowaly, Arefin & Newaz Bahar, 2012).

When conducting requirements analysis it is usually done from the perspective of the users based on what functions they need and want. However, a reoccurring problem is that users often do not know what they want from the system, or if what they want is possible to implement in practice (Eriksson, 2008). Since it is already difficult for users to determine requirements for traditional systems, it arguably becomes even more challenging as they are faced with the implementation of obscure AI solutions. Not even multinational and widely established corporations with a lot of resources posses the capacity to accurately predict how AI solutions will behave.

A good example of this is Amazon. They attempted to develop an AI solution that could work as a recruitment tool to assist the company in finding the best suited people for certain job positions. Their AI solution worked by grading each applicants resume and giving them a score based on several aspects. The problem the developers found, was that the AI solution did not grade the applicants in a gender-neutral way, and rated male applicants higher than female ones. The AI solution based its grading on previous history regarding qualities by former Amazon employees from the past 10 years. Since most of the former employees were male, the system began teaching itself that male co-workers were more qualified than female

ones. Although the AI was programmed without any bias in mind, it began to penalize resumes where words connected to the female gender was included (Dastin 2018).

All of the aspects lifted in throughout this chapter boils down to our research problem. Throughout this section it has been established that it is already difficult to determine requirements for traditional systems, so a question naturally arises on how requirements analysis is executed as AI solutions (that even fewer individuals can grasp) are being developed. Little research has been made on how the vital requirements phase is executed during development of AI solutions.

1.3 Purpose

The purpose of this work is to explore and describe how companies manage the requirement analysis phase during development and implementation of AI solutions. The relevance and need for this work is motivated by the lack of sufficient available research previously performed within this area.

1.4 Research Aim and Questions

As the interest of AI is increasing rapidly, more and more companies are leaning towards implementing AI solutions as a tool to increase their competitive advantage and promote their business (Stone et al., 2016). Implementing AI solutions must follow a set of systems development methodologies, such as the SDLC, where one of the key phases is the requirements analysis. This particular phase is vital to ensure the success of any system development project. Therefore, our aim is to research how this crucial phase is managed when developing AI solutions.

This leads to our research question:

- How is the requirements analysis phase executed during the development of AI solutions?

1.5 Target Audience

The target audience for this study are researchers and organizations who are going to perform / performing work within the fields of this study, i.e related to requirements analysis and AI. Organizations can use this study to broaden their understanding of the subject, while researchers can use the results from this study as a springboard for future research within the field.

2. Theory

In this second chapter, the theoretical framework for this work is presented. The purpose of this chapter is to provide an understanding of specific terms that are discussed within the subjects of AI, systems development and requirements analysis. Furthermore, the previous scientific works presented in this chapter will later be compared with the empirical collection in order to draw conclusions and provide an answer to the research question.

2.1 Information Systems

An Information System (IS) can be viewed in several ways and a number of definitions exist to describe the term as good as possible. The authors Laudon and Laudon (2014, p. 45) states that an IS can generally be viewed from both a technical perspective and from a business perspective, and gives the following definition of this kind of system:

An information system can be defined technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization. In addition to supporting decision making, coordination, and control, information systems may also help managers and workers analyze problems, visualize complex subjects, and create new products.

In other words, an IS can be described as a system which has the ability to assist an organization in handling and presenting useful data as well as to assist the decision making within the firm. It translates raw obscure data into advantageous information that can be used by people within the company for making decisions and solving problems. The system can in the business perspective, assist the company in making better business decisions, and therefor helping the company to flourish (Laudon & Laudon, 2014).

From the beginning, information systems were uniquely developed for a certain type of organization, company or industry with a specific role and tasks. Such systems are called proprietary systems and are still widely used today. However, as information systems experienced a greater demand amongst several organizations, standardized information systems were created. Consequently, there are two major types of system of which are standardized systems and proprietary information systems. The standardized kind exist in a large variety for close to every industry and constitutes the foundation for many of today's businesses. A standardized system is developed to satisfy and comply with requirements from several companies within a specific industry. The goal with a standardized system is to make it possible for several organizations to use the same system, which in the majority of cases will make it much cheaper, easier to develop and easier to maintain. When implementing this kind of system it can in many cases work rather painless and without the need for changing it too much, but in most of today's cases when implementing a standardized system they need to be changed and adapted to the specific business (Hedman, Nilsson & Westelius, 2009).

2.2 Artificial Intelligence

2.2.1 Definition of AI

Artificial Intelligence (AI) is described in the most straightforward way as a computer with the capability to behave and operate in a manner that can generally be associated with an