Petra Peura

Robotic Process Automation Concept for Service Management

Metropolia University of Applied Sciences

Bachelor of Engineering

Industrial Management

Thesis

6 May 2018

Metropolia

Dear reader, in front of you lies the thesis report "*Robotic Process Automation concept for Service Management"*, which describes the work that I have done to build new RPA concept for Service Management at Sofigate and its clients. This project has been written as a Bachelor's thesis for Engineering programme at Metropolia University of Applied Sciences. I have started this work in January 2018 with a lot of enthusiasm and was engaged till report has seen light in April 2018.

The project was undertaken upon request of Sofigate to address the need of the company for the robotics automation concept. The objective and outline of the thesis was set together with Sofigate and Metropolia. The thesis topic was challenging, but after conducting extensive investigation I was able to reach the desired outcome on the schedule. This was made possible with the support of my advisors at Metropolia Anna Sperryn, Jussi Alhonrinne & Zinaida Grabovskaia, Supervisor at Sofigate Jussi Vuokko and my team members including the Developer, Marketing manager and Service managers.

I would like to thank my company and school supervisors for their excellent guidance and support during this project. I would also wish to thank all of the Service Managers and other respondents, whose cooperation made this project possible. I would also like to thank my family especially my brother for the support and sparring during the thesis time.

I hope you enjoy your reading!

Petra Peura
Espoo,
April 15, 2017

Metropolia

Tekijä Otsikko Sivumäärä Aika	Petra Peura Robotic Process Automation Concept for Service Management 31 sivua + 9 liitettä 6.5.2018
Tutkinto	Insinööri (AMK)
Tutkinto-ohjelma	Tuotantotalous
Ammatillinen pääaine	Kansainvälinen ICT-Liiketoiminta
Ohjaajat	Jussi Vuokko, Delivery Manager Anna Sperryn, Lecturer

Tämä opinnäytetyö kertoo ohjelmistorobotiikan käytöstä palveluhallinnan prosesseissa. ITIL:sta, ITSM:sta, konseptien luonnista, tekoälystä sekä automaatiosta opittujen tietojen perusteella, päämääränä oli käyttää opittua tietoa sekä luoda uusi konsepti ohjelmistorobotiikan käyttöön palveluhallinnan työkaluissa.

Työ perustuu Sofigaten tarpeeseen tarjota uusia ratkaisuja asiakkailleen sekä prosessiautomaation että muiden uusien teknologioiden tehokkaaseen käyttöön. Opinnäytetyön aikana Sofigate tarjosi tukea ja tietoa opinnäytetyön aiheeseen liittyen. Ratkaisun käyttötapausesimerkit kerättiin Sofigaten palvelujohtajilta opinnäytetyön aikana pidetyssä työpajassa. Apua markkinointimateriaalien tuottamiseen saatiin markkinointijohtajalta.

Opinnäytetyön tuloksena kerättiin vaatimukset integraatiolle UiPathin sekä ServiceNow'n välille, luotiin geneeriset käyttötapaukset, joiden avulla löydettiin tarvittavat aktiviteetit, sekä testattiin aktiviteettien toimivuus palveluhallinnan prosessien mallintamiseen. Markkinointimateriaalit suunniteltiin ja luonnosteltiin niin, että ne ovat valmiita tarkasteltavaksi ja julkaistavaksi, kun UiPathin markkinapaikka aukeaa.

Uusi konsepti on helposti ymmärrettävä ja helposti käyttöönotettava olemassa olevissa palveluhallinnan IT-ympäristöissä. Opinnäytetyöprojektin jälkeen Sofigatella on uusi helposti käytettävä konsepti ohjelmistorobotiikan käyttöön palveluhallinnan prosesseissa sekä markkinointisuunnitelma materiaaleineen.

Avainsanat	Ohjelmistorobotiikka, Konseptin kehittäminen, IT Palveluhallinta, Palveluhallinta, RPA, ITSM, Markkinointi

Metropolia

Author Title Number of Pages Date	Petra Peura Robotic Process Automation Concept for Service Management 31 pages + 9 appendices 6 May 2018
Degree	Bachelor of Engineering
Degree Programme	Industrial Management
Professional Major	International ICT business
Instructors	Jussi Vuokko, Delivery Manager Anna Sperryn, Lecturer

This thesis focuses on Robotic Process Automation in Service Management. With the knowledge learned from ITIL, ITSM, concept development, AI and Automation, the objective of this thesis is to use the knowledge and to build a new concept for RPA use in Service Management for the case company. The thesis aimed to support the case company in their project to improve the use of RPA tools in their client projects and to gain more market space with increased sales in this area of the company's technology expertise. This thesis addresses the need of the case company to provide fast and reliable RPA processes to their customers.

The objective of the thesis was to create a new concept to RPA usage in the Service Management field. The outcome was a concept for the tool and the marketing plan and materials for marketing this concept. The case company of this thesis provided the researcher with the challenge and data needed to implement this thesis project. The proposal includes the RPA concept on a high-level, ServiceNow activities development requirements, testing plan and marketing plan with some materials.

To create the proposal, requirements integration between UiPath and ServiceNow were gathered. Building the proposal included creation of usable use case scenarios which helped to find the needed activities for the automation. After building the integration, this thesis included the testing plan for the proposed activities. Part of the concept creation was a creation of the marketing plan and marketing materials for this new concept.

New concept provided the case company with a new easy adaptive concept and marketing plan including some materials for RPA usage in Service Management.

Keywords	Robotic Process Automation, Concept Development, IT Service Management, Service Management, RPA, ITSM, Marketing

Contents

List of Abbreviations

AD	Active Directory is a user data base and directory service which stores information of users, computers and network resources.
AI	Artificial Intelligence is a machine or software which can produce intelligence actions such as speech, text or image recognition.
API	Application Programming Interface is a definition which allows different software to proceed queries and change information.
BPO	Business Process Outsourcing means that some of the processes in the company is provided by 3rd party service provider.
C#	C# ("C Sharp") is Microsoft based programing language which was made to combine C++'s efficiency and Java's easiness.
CI	Configuration Item can be any device or component, that needs to be managed to ensure successful delivery of IT Services.
CMDB	Configuration Management Data Base is a data base that is used to store information technology installations and relations between the installations.
CRM	Customer Relationship Management means customer oriented thinking and processes in organizations.
CSA	Current State Analysis is a report that describes actual level of maturity and relates the status for some benchmark.
E2E	End-to-end means governance of the process. End-to-end includes all stages.
EA	Enterprise Architecture consists of practices for analyzing, designing, planning and implementing enterprise's business processes and IT.

ERP	Enterprise Resource Planning includes all different activities of enterprises from producing to finance. ERP system integrates these different business functions into same data system.
ESM	Enterprise Service Management is a business management concept which enables efficient service business performance. ESM systems and platforms are used to manage processes.
HR	Human Resources is an organization in company, which is designed to help and maximize employee's efficiency and support company's strategies.
IDoc	IDoc is an electronic message form in SAP. It stores data from a business transaction between different systems.
IoT	Internet of Things means expanding network to devices and machines. Usually sensors are used to connect devices into network.
IT	Information Technology is a high level broad which deals with all technologies that processes data and information.
ITIL	Information Technology Infrastructure Library is a collection of frameworks and best practices to manage IT services.
ITSM	Information Technology Service Management is a set of processes and activities in the order to successful and controlled delivery of IT services.
KB	Knowledge Base is a technology which is used to store structured and unstructured information of systems.
KBA	Knowledge Base Article is a guide for specific action in the system, mostly stored into self-service support.
R&D	Research and Development is an organization in the company which researches and develops new products or solutions for the company.

RaaS	Robot as a Service is a service to procure robotics and implement it fast into use. Normally Client does not have own servers for ‘as a service’ type of solutions.
RDA	Robotic Desktop Automation is an attended robotic method to automate front-end IT processes such so that software can help human to proceed those actions.
RPA	Robotic Process Automation is an unattended robotic method to model and automate back-end IT processes so that software can proceed those without human actions.
SaaS	Software as a Service is a service to procure software and implement it fast into use. Normally Client does not have own servers for ‘as a service’ type of solutions.
SIAM	Service Integration and Management is a framework to gain Service Management’s business value in multi-supplier environments.
SM	Service Management is a framework to maximize service supply chains.
SOAP API	Simple Object Access Protocol API is an application programming interface which needs no expensive tools, has smaller learning curve and is efficient and fast.
SR	Service Request is a request usually for standard change that will not change the infrastructure such as access to IT service or an advisory request.
UAT	User Acceptance Testing is normally a last phase of testing process in software developing. It means that end-user tests that the solution works and after acceptance software can be deployed to production.
UI	User Interface means everything that is designed for information device. This might consist of parts such as display screens and appearance of a desktop.

URL	Uniform Resource Locator is a reference for a web resource and it specifies both location of it and the mechanism to retrieve it.
UX	User Experience is a method to design system to match user's emotions and attitude for using the product

1 Introduction

Nowadays companies have a lot of repeating tasks and processes, involving multiple systems and technologies, yet done manually by employees. This means that these processes operated during the working hours, take the time and productive attention of the employees away from the work on more creative and motivating tasks. At the same time, business and management practice show that, by enabling people to work on innovating and creative tasks the companies can gain much more advantage in the industry. Having realized that, many companies have started automating some of the processes but most of the companies do not have centralized management for these automated processes yet.

This thesis aims to innovate and improve the use of the Robotic Process Automation (RPA) in the manual routine task procedure. Business practice shows that the costs of high volume manual tasks are enormous for companies, even though these processes could be automated with software robotics. Moreover, these kinds of processes could be included to various systems and many different business functions such as Human Resource, Finance, IT and Research & Development.

To address this need, this study focuses on exploring and innovating an RPA integration solution to Service Management systems for the case company, Sofigate. Sofigate aims to offer these faster RPA process deployments to its clients who suffer from similar challenges and help them to enjoy the benefits of this kind of process automation solution.

1.1 Business Context

The case company of this thesis, Sofigate, is a Finnish Business Technology company that provides pioneer expertise in strategy, management, transformations and technological solutions. Sofigate operates in four countries: Finland, Sweden, Denmark and the United Kingdom. Currently, there are approximately 500 employees in Sofigate working with business technology.

Sofigate focuses on multiple Service Management technologies such as ServiceNow and Salesforce platform solutions: Remedy, Remedyforce and Cloud Coach. Sofigate

has a strategy to grow fast which naturally means expanding the product portfolio to multiple directions. New technologies as AI and automation currently make a big trend in business and technology. Sofigate is also willing to move forward along with those trends.

Recently, due to its target to gain a market position for RPA, the company has created a team which concentrates on new technology innovations such as Robotic Process Automation, Machine Learning and Artificial Intelligence. In addition, the company also has two other business areas: Strategic Transformations and Management Power. Strategic Transformations focuses on big transformation projects and advisory for big changes in the client companies, such as change of CIO or the whole organization wide changes. Management Power helps with services, resources and advisory to the management of the client companies. These three business areas are combined as Performance Boosters and that represent the key point of the company's existence.

1.2 Business Challenge

Some time ago, the case company noticed that it would need a New Solutions team which would focus on delivering Artificial Intelligence and automation solutions to their Service Management customers. Quickly after that, the company started developing this business area with a brand-new team. Presently, the company is working actively to discover and utilize new opportunities in the automation and Machine Learning field which not been utilized in the company yet. The goal of these efforts is to develop and deliver new ready-to-use activities for several use cases regarding the use of Robotic Process automation solutions in ITSM systems.

To address this challenge, the company is willing to create new integration solutions that would enable their users, such as companies and clients, to manage automated processes centrally for the ITSM systems: ServiceNow and Remedyforce. To help in these efforts, since the first half of 2018, the company's partner UiPath has also started working on creating a market place to grasp this opportunity and become one of the market leaders in the ITSM side of RPA integration solutions.

1.3 Objective and Outcome

The objective of this thesis is to create a new concept to use RPA in Service Management. Core idea of this thesis is to productize an UiPath-ServiceNow-integration concept, and also clarify how to implement it easily and quickly in the everyday processes and tasks of the case company.

The outcome of this thesis is the concept which includes several use case scenarios and activities to UiPath for ITSM systems and a marketing plan with some marketing materials for this concept.

To achieve this goal, this thesis will also analyze the competences of the case company to implement this proposed concept and will produce the recommendations how to move forward with this concept.

The business impact from having the RPA concept is that the client companies should be able to adopt RPA faster to their Service Management processes with the help of the case company. They should also be able to receive trustworthy solutions on managing their automated processes more centrally. After adopting this concept, the case company should become more mature in applying these process automations to the needed processes and in generating valuable RPA leads from the UiPath's market place with this entry.

2 Method and Material

This section describes the research design of this thesis, the project plan and the schedule of this project. It also describes the data sources and data analysis methods that were used in the thesis.

2.1 Research Design

This thesis is done in five stages which are shown in the research design diagram below.

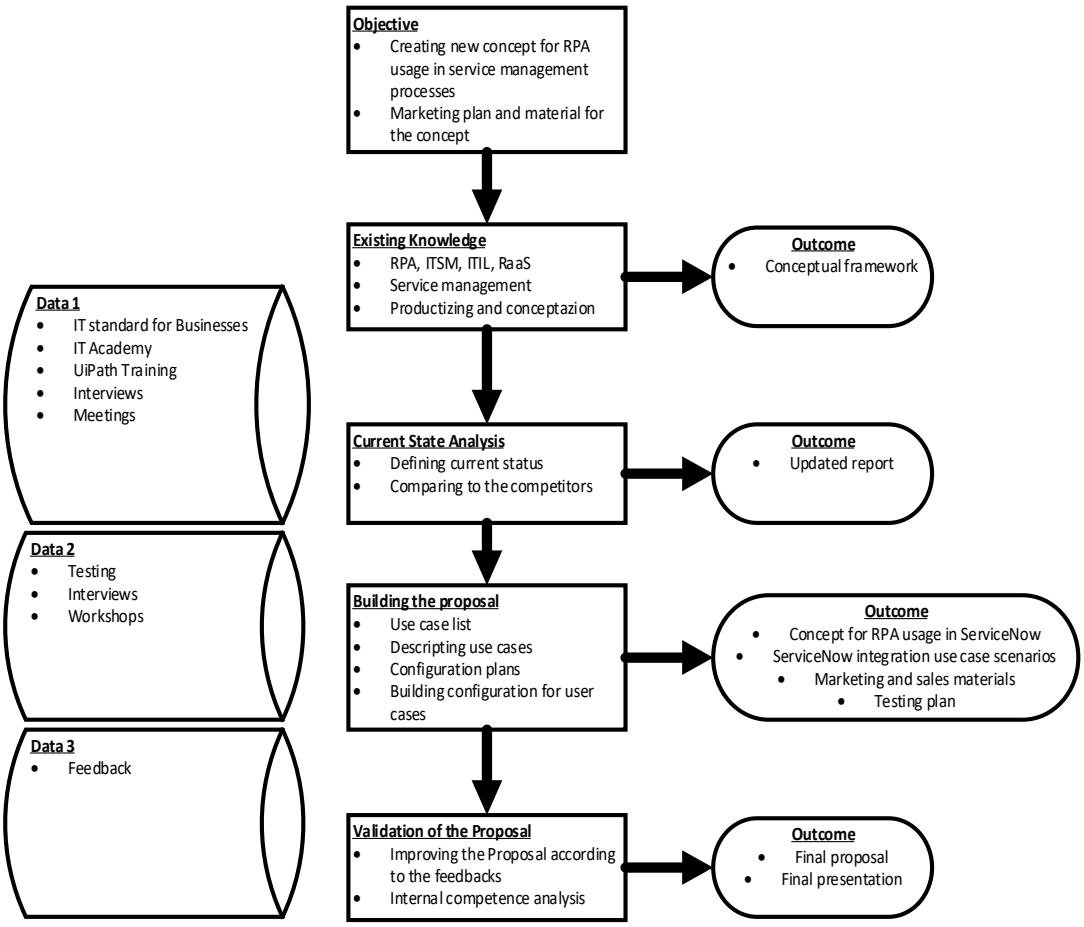

Figure 1. Research design of this thesis

As shown in Figure 1, this study begins with defining the business challenges, objectives and outcomes of this thesis. After this initial stage, this thesis focuses on exploring the existing knowledge on ITIL, ITSM, RPA, as well as the literature and company's own

material related to productizing of solution-based knowledge. At the next stage, this thesis focuses on analyzing the current state of the Robotic Process Automation in the case company. The outcome from this analysis is the updated report as the current use of the RPA in the client companies and in the company's own concepts.

Then, this thesis focuses on building the proposal based on the findings form the CSA and existing knowledge. The proposal includes a requirements' list for integration and plugin activities, a list of prioritized use cases, and the newly creating market materials for the market. The outcomes for this phase are the proposal for the process automation concept and the marketing materials.

At the end of this thesis, the proposal is presented to the case company and discussed with the stakeholders. After the proposal is built, this thesis also analyzes the competence of the case company for productizing RPA solutions. The final version of the proposal and results are redefined according to the company's feedback.

2.2 Project Plan

The thesis schedule and the tasks are presented in Figure 2 below that shows a bigger picture of the project for understanding of its scope and timetable.

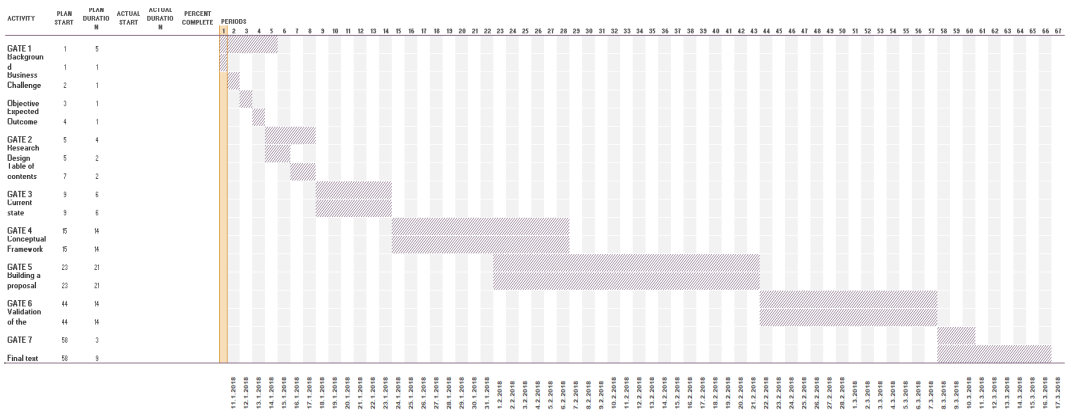

Figure 2. Gantt chart

This thesis started in January 2018 with the kick-off in the case company held by Jussi Vuokko on 14th of January 2018. This thesis is produced using 'Thesis Gate' framework.

2.3 Data Collection and Analysis

This project collected the data from a variety of data sources, in three data collection rounds. The data for the project is shown in Table 1 below.

As seen from Table 1, the data for this project was collected in three rounds. The first round collecting Data 1 was conducted for the current state analysis by discussing with stakeholders in the project, participating to webinars of the partner company, and joining the business technology academy organized by Sofigate.

In the next round, Data 2 was collected by gathering suggestions from the case company/unit for developing the proposal. This data included requirements for the concept and use case scenarios to be used in the development part of the project. The final data collection round was conducted when receiving feedback for the proposal from the case company and the stakeholders, and is named Data 3 in this study.

Table 1. Details of interviews, workshops and discussions, in Data1-3.

	Participants / role	**Data type**	**Topic, description**	**Date, length**	**Documented as**
1	Stakeholder 1: Delivery Manager	Meeting	Thesis Objective and scope	Nov 2017, 60 min	Memo
	Data 1, for the Current state analysis (Section 4)				
2	Stakeholder 1: Delivery Manager	Meeting	Background and Customer case	Jan 2018, 60 min	Memo and ppt of the background
3	Stakeholder 1: Delivery Manager	Meeting	Final Thesis Objective and scope	Jan 2018, 60 min	Memo
4	UiPath	Webinar	UiPath 2018 release	Feb 2018, 90 min	ppt, video
5	Academy	Onsite-training	IT standard for businesses and RPA case	Feb 2018, 2 days	Memo, ppt

	Data 2, for Proposal building (Section 5)				
6	Stakeholder 1: Delivery Manager, Advisor 1 and Developer	Kick-off	UiPath to ServiceNow/BMC connector: background, requirements and expectations	Feb 2018, 60min	Memo
7	Stakeholder 1: Delivery Manager, Advisor 1 and Developer	Meeting	UiPath to ServiceNow/BMC connector: Status check and validation of the project scope	Feb 2018, 30min	Memo
8	Advisor 2, Advisor 3	Workshop	Customer use case scenario examples	Feb 2018, 30 min	Memo, use case scenario examples
9	Developer	Meeting	Use case scenarios and UAT	Mar 2018, 30 min	Testing documents
10	Developer	Call	Testing	Mar 2018, 30min	Memo
11	Marketing Manager	Meeting	Marketing materials	Mar 2018, 60 min	Memo
	Data 3, from Validation (Section 6)				
12	Marketing Manager	Meeting	Marketing materials validation	Mar 2018, 60 min	Memo
13	Delivery Manager	Presentation	Proposal validation	Mar 2018. 30 min	Memo

In this study, workshops, meetings and interviews made the primary method of the data collection. Interviews were conduct as semi-structured, face-to-face interviews held on the company premises. Field notes and observations from the Service Manager workshop for creating use case scenarios can be found in Appendix 6, and marketing workshop results and fields notes in Appendix 7-8. The biggest part of data collection and analysis was done for the proposal stage, Section 5, to create for the company. Before that, the study focused on the exploration of existing knowledge and best practice around RPA in Section 3 below.

3 Existing Knowledge and Best Practices on ITSM, ITIL, Automation & AI and Robotic Process Automation

This section, first, discusses the existing knowledge and best practice in ITIL, ITSM, Automation and RPA areas. These topics are selected to gain more knowledge from literature and identify the most relevant inputs, so that the creation of the proposal would be based on best practice. This section starts with the focus on ITIL and ITSM in general as the two most used IT Service management approaches. After that this section, this thesis focuses on automation and its levels, and after that, on Robotic Process Automation and available solutions to help the automation of processes. In addition, this section also touches upon the available knowledge of productization and marketing of solution-based products and on methods and practices on how to measure and analyze the internal maturity of a company to these kinds of solutions.

3.1 Introduction to ITIL and IT Service Management

Before getting into ITIL and IT Service Management, it is necessary to clarify the definition of services that lie at the heart of both approached. Service can be defined as a set of means that delivers value to a customer by facilitating outcomes that the customer wants. (van Bon, et al., 2009) Service Management stands for a large variety of specialized organizational capabilities to deliver this previously mentioned value in the form of service. (Adams, et al., 2009) For example, for a company which offers maintenance for cars as a service, Service Management would mean the capability to ensure good quality maintenance, by buying tools and resourcing enough of skilled people.

ITIL is a library of frameworks and best practices to manage and lead IT services in different sized companies. First books of ITIL were published in the 1980s and now there are three versions of it. ITIL V3 covers whole lifecycle of IT Service Management: Service Strategy, Service design, Service transition, Service operation and continual service improvement. (Adams, et al., 2009) ITIL has become one of the respected and most common best practices in the IT Service Management field.

There are a lot of benefits that come from using ITIL as model to practice Service Management in companies. One of the main benefits is to get the business and IT more aligned. (Watts, 2017) When the business and IT is working together and they have a

strong alignment between each other, companies can gain high value on all business activities. IT has been supporting business operations as long as there has been IT infrastructure in companies. If business is not fully working with IT, IT operations are not capable of supporting businesses as effectively that it could. (Watts, 2017) With effective use of ITIL, companies can improve both: service delivery and customer satisfaction. They can also gain more visibility to IT costs and assets, which allows them to reduce the costs in many ways for example by utilizing resources of IT.

ITIL framework is the source of the good and best practices in IT Service Management. ITIL is a collection of books which has two components: ITIL Core and ITIL Complementary guidance. (Adams, et al., 2009) Knowledge on ITIL and ITSM is very helpful for companies to check and improve their services to provide more value. This part is crucial since services require big efforts from the company in the order to succeed. It is also important to know how to manage those services.

ITIL core includes the best practices that are applicable for different types of IT services in companies and organizations. However, these practices can be applicable only if the companies provide services to a business. On the other hand, ITIL complementary guidance means publications for specific industries such as cloud computing companies or IT service support companies. Complementary guidance can also be useful for specific operation models or organization types. (Adams, et al., 2009) Figure 3 below shows the ITIL service lifecycle.

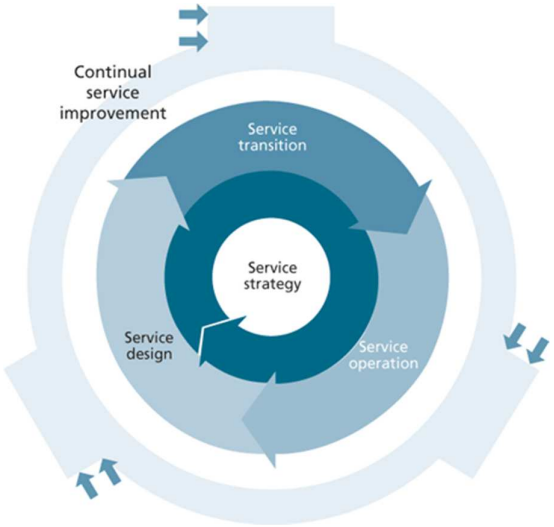

Figure 3. The Service Lifecycle (Adams et al., 2009).

As seen in Figure 2, ITIL core describes full lifecycle of IT services. It consists of Service strategy, Service design, Service transition, Service operation and Continual service improvement. (Adams, et al., 2009) This service lifecycle gives guidance to develop and maintain the whole service, as well as guide organizations in transitioning the service to operation and keeping track of continual improvement of the service, and also for putting the service to retirement at the end of its lifecycle.

3.1.1 ServiceNow

ServiceNow is a Service Management software which was created in 2004 by Fred Luddy in San Diego, USA. ServiceNow is currently a technology company which offers a platform for effective Service Management tools and applications. ServiceNow as a company has over 5600 employees, 16 data centers worldwide and it is represented in 73 countries over the world. (ServiceNow, 2018) ServiceNow has over 1000 partners and Sofigate is one of those. Sofigate covers most of the Nordic companies that uses ServiceNow with its IT Service management.

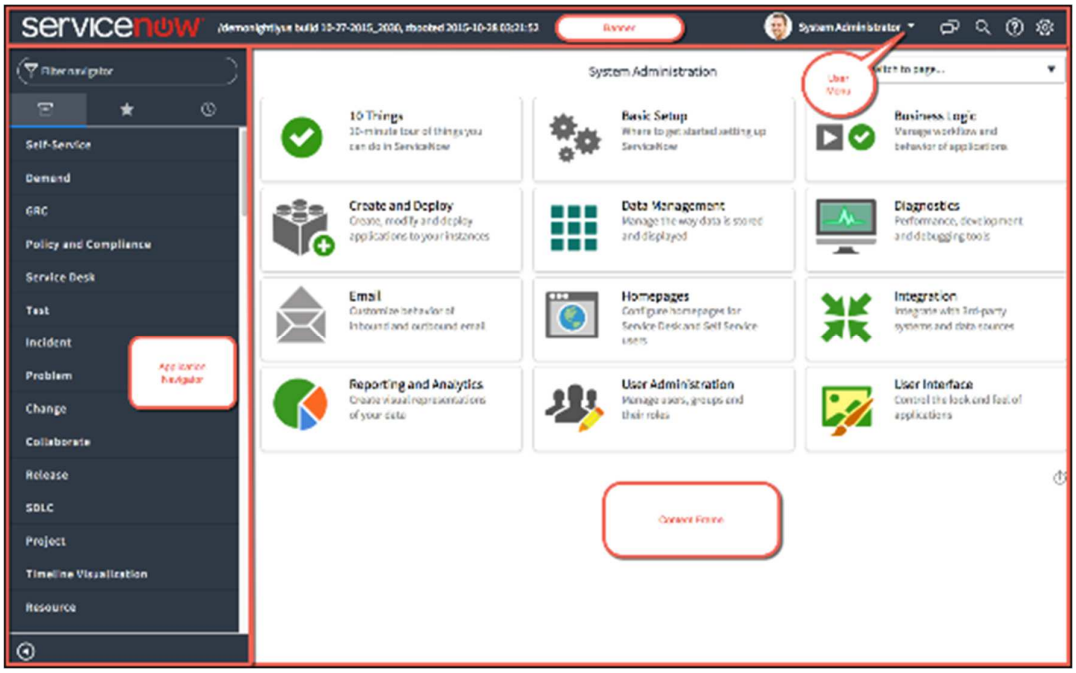

Figure 4. ServiceNow user interface.

ServiceNow was known as an ITSM platform but currently it has extended the platform usability to cover all other business functions such as HR, customer service and security.

ServiceNow is designed to transform the ways that work is done in their client companies. ServiceNow also states that they want customers to keep focusing in the actual work by creating highly user-friendly interfaces. ServiceNow has developed their platform so that it would be easy to use and processes should not waste time and money anymore. ServiceNow is cloud-based which is highly secure and scalable for complex enterprise architectures. (ServiceNow, 2018) The platform ServiceNow could consist of service portals, knowledge base and single database such as shown in Figure 5 below.

Figure 5. ServiceNow: Now Platform

As shown in Figure 5, ServiceNow has a large variety of tools and applications which are suitable for most of the industries. ServiceNow offers many solutions and tools for the entire company: (ServiceNow, 2018)

- For ITSM: Modernization of IT Service Management
- For IT Operations Management: Eliminating Service Outages
- For Security Operations: Resolving Security Incidents and Vulnerabilities Fast
- For Customer Service: Increasing customer satisfaction
- For HR: Improving the employee service experience
- For IT Business: running IT such as a Business. (ServiceNow, 2018)

ServiceNow is not only service management tools for IT,but also for other business organizations as well. With these kind of tools, companies will gain more visibilities into their processes, which are currenlty procceded via email or even by verbally from employee to another. These tools are helping managers to think resources needed and find the root causes of time consuming tasks.

3.1.2 Remedyforce

Remedyforce is a Service Management software built on Salesforce platform by BMC. BMC is a software technology company which has over 6000 employees in 30 countries and more than 10,000 customer companies worldwide using their products. BMC has revenue of $2 billion and they have 500 partners serving mid-sized companies to major enterprises. BMC also offers different onsite and cloud solutions for Service Management, cloud management, workload automation, IT automation, It operations and mainframes. (BMC, 2018) Figure 6 below shows Dashboard UI of the Remedyforce ITSM system.

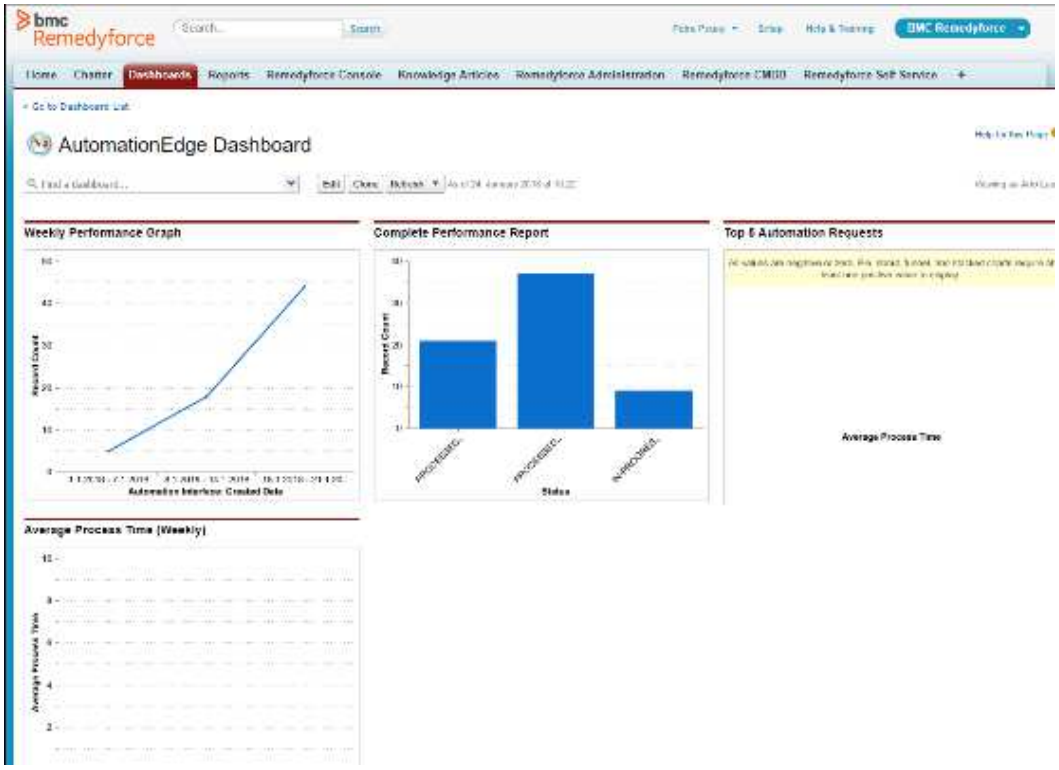

Figure 6. BMC Remedyforce dashboard UI.

Remedyforce is developed with comprehensive functionalities, mobile and social accesses. It has intuitive dashboards and reports for effective reporting. BMC gives seamless upgrades two times a year. (BMC, 2018) Figure 7 below shows BMC Remedyforce UI where user can see all the incidents of the ITSM system.

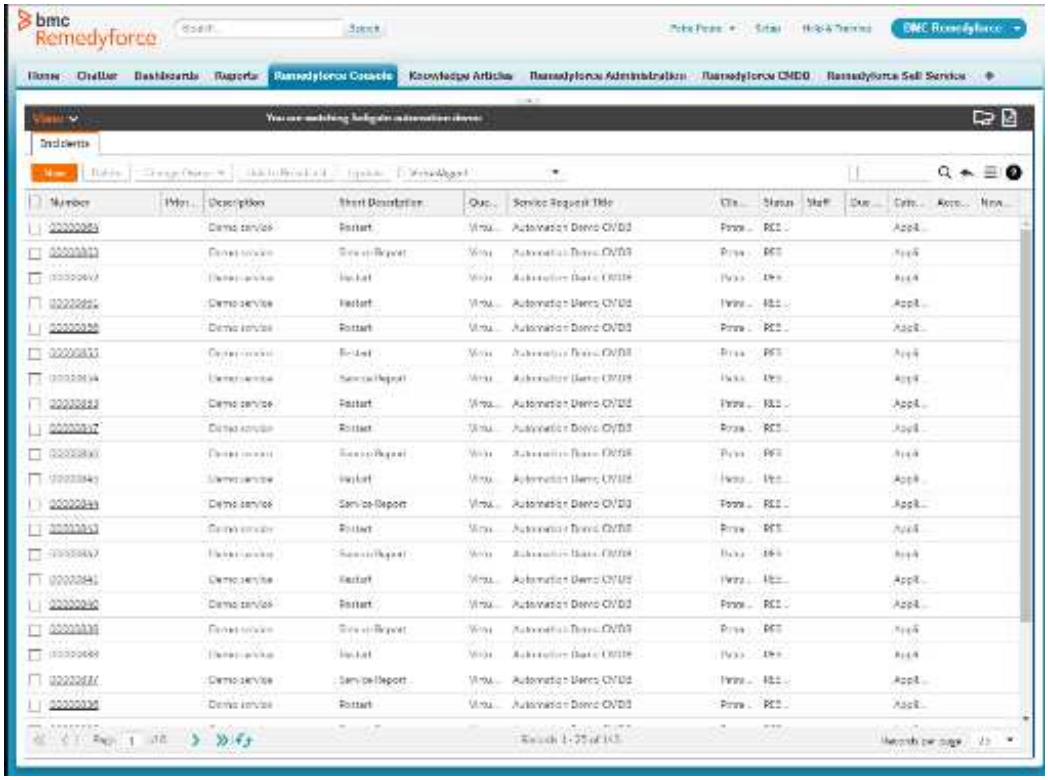

Figure 7. BMC Remedyforce Console UI.

One of the biggest benefits of Remedyforce is that it is based on Salesforce platform, which means most of the Salesforce user companies, will get it easily implemented to use and integration for their Salesforce org and data is not too complex. There is a lot of similarities to Salesforce when it comes for configuration and basic usage of the software.

3.2 Introduction to Automation and AI

To discuss more about Robotic Process Automation (RPA), it is necessary to understand the basics of Automation and Artificial Intelligence (AI). Artificial Intelligence means approach and ideology where a machine or software can produce intelligence actions such

as speech, text or image recognition. (Gil, 2017) Robotic Process Automation is an unattended robotic method to model and automate back-end IT processes so that software can proceed those without human actions. (UiPath, 2018)

Recently, AI has become a high trend in the technology industry and has been considered as the fourth revolution of industries. Within a short time period, there has been multiple AI suppliers that have marketed themselves to leading and trending positions. Almost everyone in the industry has heard about AI solutions such as IBM Watson, Apple Siri or Amazon Alexa.

Biggest benefits of using Automation and AI are cost reductions, increases in productivity, more availability hours and reducing mistakes and errors to increase reliability and performance. (Cameron, 2018) With Automation, companies can provide value for themselves and their customers. This provision of *Automation* can happen by facilitating the most wanted outcomes of the users and achieving these outcomes without the ownership of risks or costs.

3.2.1 Levels of AI

Artificial Intelligence is a computer science where computer is programmed to simulate learning and analyzing processes of human. AI can be divided into two different methods: symbolic learning and Machine Learning. *Symbolic learning* is used for computer vision to process images and robotics to model movements. With symbolic learning, computers can process scenes as human would process images and movements. Then, *Machine Learning,* which is considered as a science that enables computers to make action without full programming. Machine learning can be roughly divided into two learning methods: statistical and deep learning. *Statistical learning* is based on data and statistics, which has enabled computers to recognize speech and process natural language as written texts. *Deep Learning* is based on methods that try to simulate the neuron networks of human brains, which allows computers to recognize objects in scene. (Ostdick, 2016)

There are multiple technologies to use AI to gain value for companies. Robots can be roughly divided into two categories: physical robots and software robots. *Physical robots* is called industrial robots and this technology is easier to understand. Industrial robots are doing physical work in manufactories and constructions. These kinds of robots can

be used to manufacture products continuously with a more even quality and faster than human could do. (Gil, 2017) Another example of physical robots applications is in retail and warehouse, where the robots are also physical robots which automate *movement* capabilities in stores and warehouses. This kind of automation is commonly used in Finnish Pharmacy stores to get the needed drug from the warehouse location to a pharmacist. A third type of physical automation method is called a *Customer self-service* and it means physical solutions to face customers such as touchscreens or portals. (Gil, 2017) Customer self-service can be used in different actions such as self-check-in in a reception or an airport and on ordering devices or creating tickets on self-service portal. These enable structured data to proceed simple automation cases. (Gil, 2017) Self-service portals makes life easier and faster. Still it is crucial to remember that user experince plays a huge role in great self-service portals. To be successful, portals need to be as easy and flexible to use that user does not need help to use it.

Next technology is *AI-Assisted Robotic Process Automation*, which means that software robots will be proceeding automated workflows in the organizations. This technology is ideal for high volume, well described processes, transactions or workflows. In this technology, robots need to be instructed and taken to use. (Gil, 2017) This kind of automation could be used in companies from all industries. It could be also one way to avoid the outsourcing of IT processes.

Another example is a Virtual Assistant, one of the software robotics technologies and it is a software that is made to get data from the user, analyze their needs and, in the end, make decisions for them. These types of robots are used to communicate with the user or the client. This technology type's most commonly known suppliers must be IBM Watson, Amazon Alexa and Apple Siri. (Gil, 2017) This kind of assistant could be used to help users and possible customers to find solution without actual human help. Assistant could help user to create a ticket and look through knowledge articles before escalating actions to human.

Last, but not least, a technology type which is called *Sensory AI,* which means sensors that allows to identify and express human sensory faculties or emotions by using different methods such as analyzing image or video, speech or text and even by using facial recognition. (Gil, 2017) With sensory AI, automation usabilities are almost limitless. Since automation reaches levels of human hearing, seeing and talking, companies could do

suhc things that are currenlty seen in the science movies. Within few years, robots might not be as rare than those are now.

In the next chapter, this thesis will focus on more to Robotic Process Automation and its capabilities as an automation method.

3.2.2 Robotic Process Automation (RPA)

Among the methods discussed in the section above, one of the automation methods is the Robotic Process Automation (RPA). RPA is a good tool to automate heavy manual repeating tasks and workflows in the companies (Gil, 2017). It allows companies to use their workforce on the actions, tasks and activities that are motivating and more creative. This brings one concern to both the employers and the employees minds, how to deploy robots so that the employees keep their jobs. Good change management is crucial when taking these kinds of tools to use. It is also important to remember approaching automation by helping workforce to do their jobs more efficiently.

RPA enables companies to re-evaluate their workflows and processes. By re-evaluating and describing processes more carefully, companies can eliminate possible bottlenecks and thereby get the processes leaner. Leaning the processes means that all extra and unnecessary steps are cleaned from the process so that the lead time and quality gives more value to the companies. RPA enables speeding up operations and simplifying workflows and only these actions will save time and money. Companies can also use RPA to gain more resources as robots can be working tasks 24/7. (Automation Edge, 2008) These RPA methods enable companies to reach a whole different level with the technolgy usages in their processes. Few years back, almost many companies started to outsource IT related actions and processes. Now the trend is starting to turnaround, and companies are willing to manage processes themselves with robotics.

3.3 Automation and AI in ITSM

In ITSM, Automation and AI allows for a lot of possibilities to improve processes by limiting unnecessary steps away from the manual processes and allowing those processes to be proceed more efficiently. According to Greene (2017), with AI, companies can expect that decisions will be more data-driven and end-users would be able to find answers

to their own questions faster than before. IT staff would be released from answering the same questions over again to more intelligent and challenging problems. No one really likes to answer same questions continuously. (Greene, 2017) AI basically allows IT staff to concentrate solving the actual root causes and use their intelligence to other transformations.

3.3.1 UiPath

UiPath is a software company that offers platforms to build and run robots for companies, BPO providers and shared service organizations. Their mission is to eradicate repetitive tasks through the intelligent use of software automation. UiPath has over 500 employees all over the world. UiPath's offering consist of three main products: Studio, Robot and Orchestrator. (UiPath, 2018) UiPath has simple and easy softwares which looks familiar to the user. Softwares are looking a lot like 'Microsoft Office' softawares, which might be a reason to easiness as well.

UiPath Studio is a tool for creating models of business processes that will be automated with RPA. It uses visual and highly intuitive way to model processes. When processes are modelled in Studio, it uses two-dimensional process modeling based on actions that users would make in UI. There is quite good variety of drag-and-drop activities to help with modeling the processes. The key advantages of Studio are fast and smart automation possibilities and one of the best Citrix automation methods that uses computer vision to perceive the screen. (UiPath, 2018) Figure 8 below shows the UiPath studio UI which is used to model the processes for the robot.

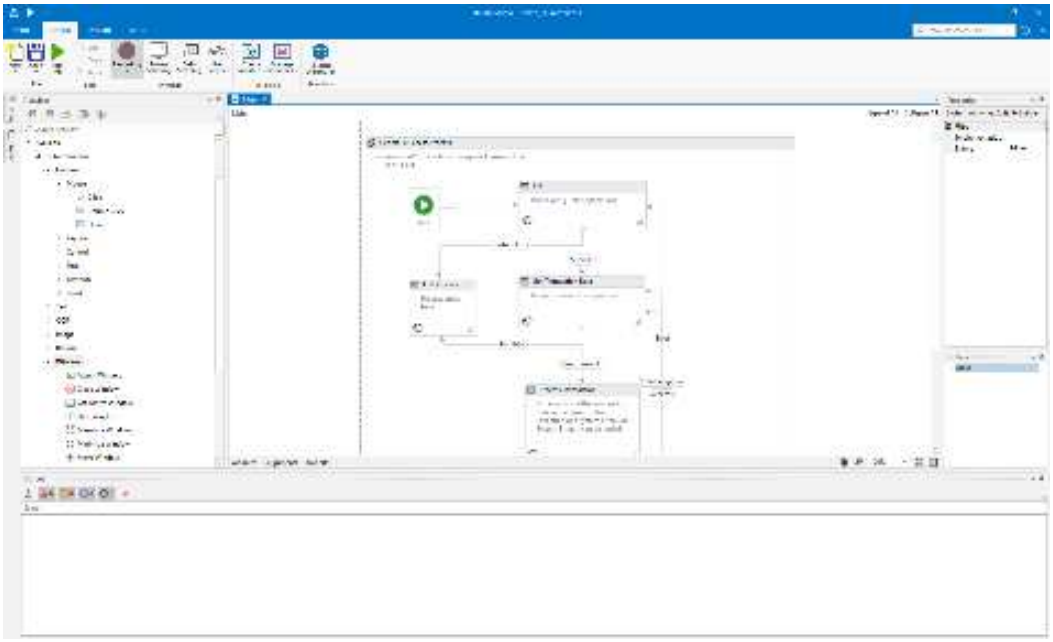

Figure 8. UiPath Studio UI.

UiPath Orchestrator is a scalable server platform to for deploying and managing one or more robots at the time. By using the orchestrator, a user can monitor and audit robots' actions and schedule processes to be ran when needed. Orchestrator is also used to manage work queues, transactions or to run reports. Key advantages of Orchestrator are higher performance on the processes and reducing costs efficiently. It also allows the user for global deployment without scaling limitations. (UiPath, 2018) This is basically used for centralized management of all the robots that a company has. As a user of this type of orchestration, the user can check if there are robots available and assign them to different jobs or queues. Figure 9 below shows the UI of the orchestrator which is sused to manage robots and processes centrally.

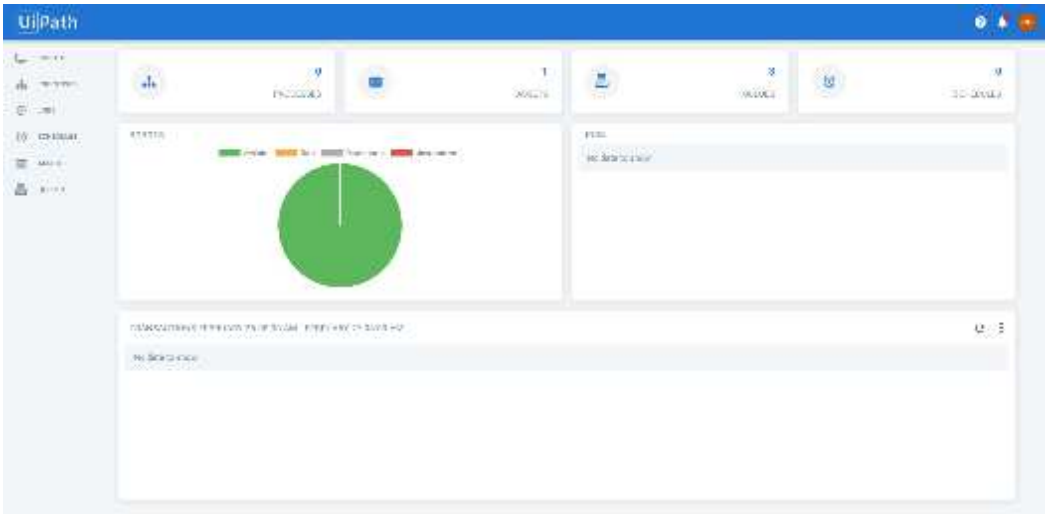

Figure 9. UiPath Orchestrator UI.

There are two kinds of robots that UiPath offers: attended and unattended. *Attended* robot will cooperate with employees in the situations where actions by human are necessary. It can be triggered to action when needed and it works on the background. On the other hand, *an unattended robot* operates without any personnel actions. It can be run in a cloud or in server environments and it is called more like back-office function. For running these unattended robots, user needs the orchestrator to manage and audit robots. (UiPath, 2018) Figure 10 below shows the UI of UiPath Robot which connects processes made into Studio to the orchestrator.

Figure 10. UiPath Robot UI.

All together, these three software combines seamless deployments from testing in Studio to Orchestrator and full production actions. In next chapter, this thesis focuses on Software as a Service as a theory and its benefits.

3.3.2 Software as a Service

Before talking about robotics as a service, it is crucial to understand the basic concepts of cloud computing and Software as a Service (SaaS). Cloud computing is a method that is also considered as “the cloud” and it means delivering on-demand computing such as applications or data centers. Mostly these services are offered so that companies pay for their usage. Cloud computing gives the possibility to scale services both up and down easily and quickly. It gives a great advantage to meet demands of the users and customers. (IBM, 2018)

In Service Management, application of SaaS mostly relates to cloud-based applications such as CRM, ERP and other systems that are offered from the cloud. Users can connect these cloud-based solutions anywhere in the world if they do have internet access. SaaS solutions are transformed to companies so that they do not need huge server rooms and people to maintain those anymore, for running the business. (ICT Standard Forum, 2017)

According to IBM (2018), the biggest benefits of using SaaS solutions are that users can just sign up and use a lot of different kinds of business apps on the go. Apps and data are highly available from anywhere and on any connected device. Data is also stored to the cloud so there is no harm if user’s device breaks. Solutions and services are scalable to the needs of usage. (IBM, 2018)

As a summary of this part of the thesis, key points were to introduce the theory behind ITSM and RPA and also present Service Management and RPA tools used to achieve the outcomes of the thesis. This chapter descriped key benefits of the SaaS offering which are easy implements and cost effiecient maintaining.

Since, the theory and tools have been introduced, next phase is focusing closer on to the objective of the thesis, which is to create RPA concept in Service Management. As concept will be built, the next phase will consist the theory and method that was used to the building process of the concept.

3.4 Concept Development

According to dictionary, concept means an abstract idea or a thought (Merriam-Webbster, 2018). In businesses and companies, concept is mostly used to sell an idea,

process or a certain way of working. This chapter consists a description of one best practice for building and developing concepts.

In Service Management business, a concept is usually described as an idea to help sell. Companies usually collect product concepts to build and expand their product portfolios. There are many processes to convert ideas into working solutions and most of those processes is based on sprint method. (ICT Standard Forum, 2017)

Figure 11 below illustrates a simple approach to building a concent in a company.

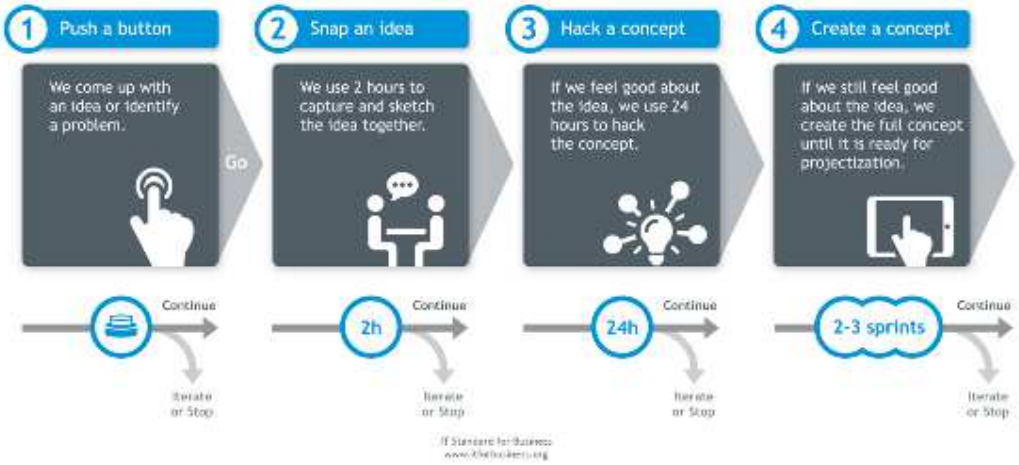

Figure 11. Concept Development process with increasing depth of commitment (ICT Standard Forum, 2017).

Basic idea of concept development illustrated in Figure 11 is that there is a need or an idea. After identifying the idea, it is planned to be tackled. Once the idea has been approved, it is crucial to capture and try to sketch idea together with all the participants. If the idea still feels good, it is time to continue the process and try to hack it. Hacking means trying to find solution in very short time. With this method, it is crucial to discuss after each step and sprint, if the idea is worth of further developing. (ICT Standard Forum, 2017)

A good idea can be converted into a concept quite easily. To getting the concept into greatness, it needs to find the exact and right audience. In the order of selling the concept, it is important who are the correct customers and users for the concept. It is also important to understand how to tell this audience about the concept. Key elements

of getting to the market and gaining interest of the leads, are marketing skills and the material used to it. In the next phase, this thesis will approach basics of marketing and methods to create a good marketing plan.

3.5 Marketing

In general, marketing is considered as a process to get product or service from manufacturer to consumer. This process consists of stages from creation of the product to moving it to proper selling channel and to consumer. When creating marketing for a product, it is crucial to understand who are the likely buyers and then promoting it to them. (Lake, 2017) Figure 12 below shows marketing concepts and key elements of knowledge that needs to be built before creting marketing plan.

Figure 12. Marketing concept (summarized from: Lake, 2017).

As seen from Figure 6, marketing starts with identifying the proper market for solution and doing a market research. After understanding the market, it is important to understand the needs of the customer. When idea of the solution is prepared, it could be good to test with small group of potential customers. This test would tell if the solution is worth of developing.

After identifying the needs and market, it is good to frame an approach to create seamless experience for customers to interact with the brand or enterprise. With a great mix of marketing tactics, methods and channels, companies can ensure that the message is received by customer. It is also important to keep all these in line and keep the content same.

Good marketing plan consists of components shown in Figure 13 below. Product should be advertised so that there is visibility in multiple channels. Advertisements can be distributed through multiple channels such as paper, television or radio. It is important to

have brand that consumers can related to, something that would be remembered. Internet is amazing tool for marketing. There are possibilities to large distribution, but internet has also its downside. If something is wrong in the product, the information spreads rapidly. Figure 13 below shows the components of marketing, according to Lake's guide of marketing 2017.

Figure 13. Components of marketing (Lake, 2017).

Other key point of marketing is that the company has a product that is sellable. Without such a product, there is no need for marketing. As mentioned before, marketing research is crucial and with proper research, marketing actions would be easier. When knowing the competitors and the market, it will be easier to convince consumers to choose the company's product. Last, but not least, no company operates and succeeds without a strategy. Good marketing strategy gives the marketing a meaning. When there is a meaning, companies can be really committed to their products and it will have positive impact to the success of marketing.

When creating a marketing campaign, it is good to analyze different elements of how consumer makes decisions. The most classical approach to the content of marketing was formulated as 4Ps of marketing in 1960 by James McCarthy. Figure 14 below shows 4Ps of marketing that are used to analyze the market, product, promotion, place and price. These elements are needed for building the proposal for successful marketing.

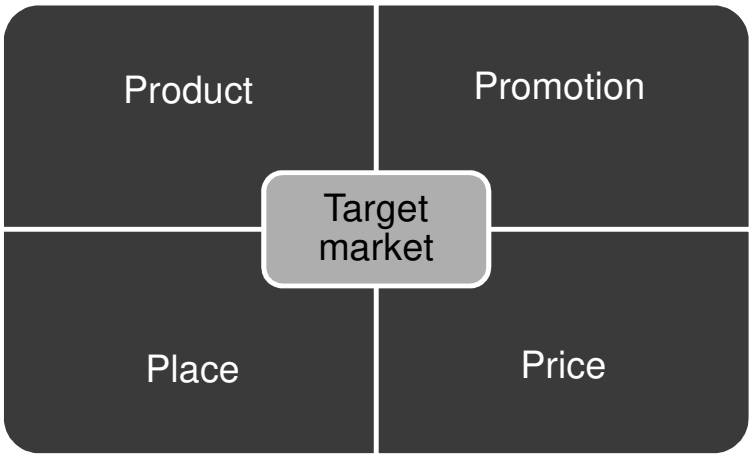

Figure 14. 4Ps of Marketing.

By using 4Ps, the market plan can be more detailed and targeted to a specific target market. The first *Product s*ection addresses the questions about the product. In this phase, the product is fully evaluated by checking the brand, variety, quality, packing, sizes and services etc. *Promotion* focuses on describing sales promotions, advertising, direct marketing and possible public relations. The *Place* part relates to the distribution channels, coverage, inventory and locations of the concept or product. In the *Price* part, the price of the sellable product is defined. In this part, discounts, allowances and payment terms are most commonly described. (Toggl, 2018) With this kind of analyze, it is easy to understand fully the product and its changes in the market.This helps also to get real image of would the idea or product be successful or not.

3.6 Conclusions from Literature Review and Conceptual Framework of the Thesis

As a conclusion from the literature review, the most relevant inputs from available knowledge and best practice are merged below into the conceptual framework for proposal building. This conceptual framework points to the key areas influencing the robotics process automation.

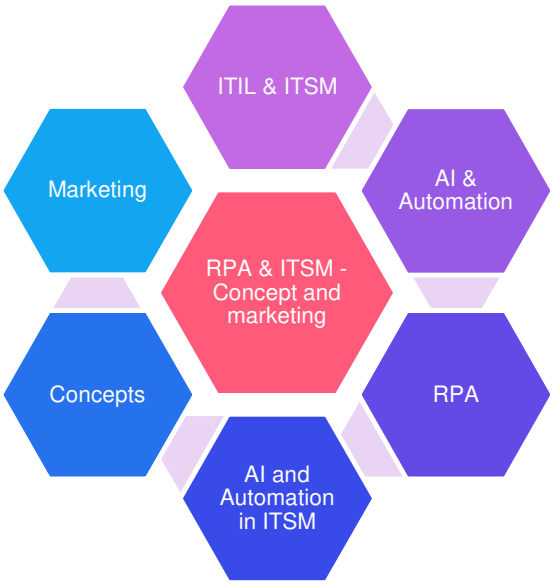

Figure 15. Conceptual framework of this thesis.

As seen from Figure 8, the conceptual framework is built to connect the knowledge areas on the topic of this thesis. It shows where from the knowledge required to perform this thesis has come from. The framework is especially rooted in ITIL and ITSM best practice, and also includes such areas as Artificial intelligence, automation, RPA, and relevant concepts. The conceptual framework is created to shows the big picture influencing the topic of RPA and introducing the relevant tools and software used to practice ITSM. It also helps to clarify which topics are selected to build on, before the thesis starts focusing more on AI and automation in both general and ITSM related areas.

Secondly, another important area is the input from concepts and marketing knowledge, since this thesis focuses on concept development and marketing. Therefore, the literature was also explored regarding the concept development model and marketing mix theories. This knowledge gave a wide view of the topics and ability to understand what needs to be considered when conducting the tasks.

When researching and studying, it came clear that the ITIL framework focuses primarily on what to do to ensure value of IT services, but it does not explain how to achieve those effectively. This shortcoming was overcome by complementing the framework with other more practical knowledge about the topics.

4 Current State Analysis of Automated IT Service Management

Due the confidentiality of the material, this part has been moved to Appendixes'.

5 Building Proposal for the ITSM RPA usage

Due the confidentiality of the material, this part has been moved to Appendixes'.

6 Next steps and tips for the RPA in Service Management

Due the confidentiality of the material, this part has been moved to Appendixes'.

7 Summary and Conclusions

This section includes the summary of the thesis results and conclusions on how thesis have managed to meet the objective. This section also contains an evaluation of the work comparing the objectives and actual results.

7.1 Executive Summary

The case company of this thesis project, Sofigate, is willing to gain more space in the Robotic Process Automation in Service Management area with UiPath partnership. For this purpose, the case company has been investing into the tools for RPA processing by developing the ServiceNow integration package to the UiPath activities.

The first phase of this thesis focused on exploring the value of RPA and the company's offering to the customer companies. The thesis found that, with RPA, companies can ease their employees' manual tasks and provide new tools for routine tasks, so that to focus more on developing people's core competences. With RPA in Service Management, they can create new roles and tasks for existing employees. Cost efficiency is one of the key drivers when companies consider using automation in their processes. With robotics, they can proceed long taking and high-volume tasks 24/7 excluding the maintenance of the servers. With these concepts, companies can innovate and create new business opportunities with unlimited digital resources. By automating processes, companies can also get their processes flawless and rapid.

This thesis proposed that, by choosing Sofigate as a partner, companies will gain expertise of transformation projects that enhance processes and increases automation. They will get practical know-how of the automation possibilities of RPA in all business technology tools such as Service Management, EPR and CRM systems, based on the extensive expertise of the case company with these tools. Sofigate can also offer change management best practices and know-how from own experience when it comes to this kind of IT and organizational changes. Figure 28 summarizes the value proposal of the RPA for the client companies proposed in this thesis.

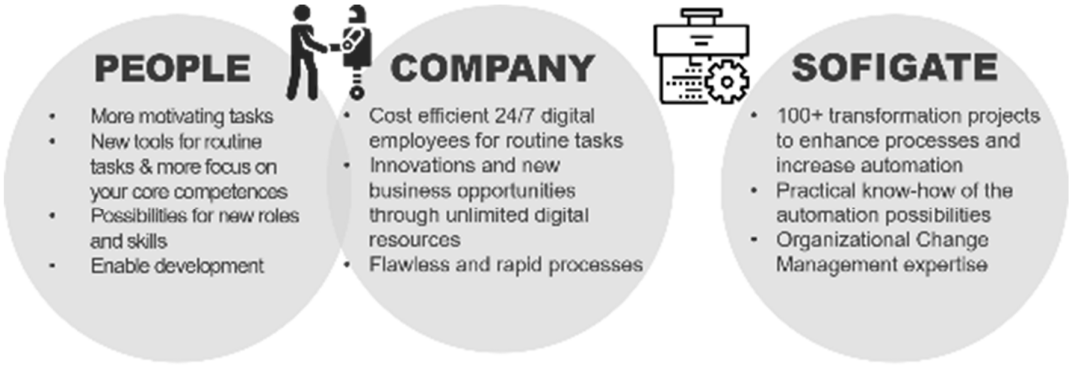

Figure 16. Value proposition of Sofigate's RPA offering.

In the second phase of this project, the key activities in ServiceNow and other Service Management tools were identified for creating easy tools for RPA developers. After identifying the key actions, a few most useful use case scenarios were detected and the integration development of the UiPath-ServiceNow activities started. The concept of the RPA use in Service Management related to introducing a new digital employee that is a process expert, called ROOPE (robot). With this concept, companies will get effective use of RPA and at least 5 times faster processes into their daily life.

After several rounds of testing, the activities and use case scenarios were updated according to the needs of the company's teams. After that, drafting the marketing material started for the RPA concept. At this stage, it was important to figure out which kind of material is needed to be created for the market place, raas.fi and conference. All that material was written into the marketing plan and is published from draft to the final versions during April 2018. As there is no specific market place launched yet by UiPath, material for that was not possible to finalized before the demonstration of the actual platform. However, texts and pictures for the raas.fi, flyer and market place entry were drafted according to the needs and insights of the partners.

As the next steps, this thesis introduced an idea of the RPA concept for the full end-to-end service of robotics in the case company. This end-to-end service would cover Robotic Process Automation from its creation to retirement and prioritizing new processes.

7.2 Thesis Evaluation: Objective vs. Results

The thesis aimed to support the case company in their project to improve the use of RPA tools in their client projects and to gain more space in the market with increased sales in this area of the company's technology expertise. This thesis objective was to create a new concept to RPA usage in the Service Management field. The outcome was a concept for the tool and the marketing plan and materials for marketing this concept.

This thesis managed to achieve concept idea and create marketing plan for several coming months. The company has supported the thesis very well, in many various ways, and advice has been available always when needed. In the marketing phase, a bit more help could have been useful as the researcher did not have such experience before but overall the thesis objective was successfully met. However, names for the concept and drafts will need more effort to be fully accepted before going into the market.

7.3 Final Words

This thesis has been an instructive and valuable experience for me. The skills and knowledge that I as a researcher have gained about the concept creation and marketing will help me with my daily work in the future.

The overall learning experience, that I as a student have got from working on this project has been much more valuable than any theoretical learning. I have had a great chance to use my theoretical understanding and put it into practice to benefit my case company.

References

Adams, S. et al., 2009. *ITIL V3 Foundation Handbook.* 2nd ed. London: TSO.

Alasuutari, P., 1995. *Laadullinen tutkimus.* 3rd ed. Tampere: Vastapaino.

Automation Edge, 2008. *Automation Edge.* [Online] Available at: https://www.slideshare.net/AutomationEdge/automation-edge-presentation [Accessed 27 02 2018].

BMC, 2016. *ITIL Processes & Best Practices.* [Online] Available at: https://www.bmc.com/guides/itil-introduction.html [Accessed 24 02 2018].

BMC, 2018. *About BMC Software.* [Online] Available at: https://www.bmc.com/corporate/about-bmc-software.html [Accessed 25 02 2018].

BMC, 2018. *Remedyforce.* [Online] Available at: https://www.bmc.com/it-solutions/remedyforce.html [Accessed 26 02 2018].

Cameron, P., 2018. *Automated Operations: 5 Benefits of Automation.* [Online] Available at: https://www.helpsystems.com/resources/guides/automated-operations-5-benefits-your-organization [Accessed 28 02 2018].

Culp, S., 2016. *Robotics: The Next Frontier For Automation In Finance And Risk Management.* [Online] Available at: https://www.forbes.com/sites/steveculp/2016/04/20/robotics-the-next-frontier-for-automation-in-finance-and-risk-management/#3a31b831380d [Accessed 26 02 2018].

Data & Marketing Association, 2018. *Integrated Marketing Definitions.* [Online] Available at: https://thedma.org/membership/member-groups-communities/integrated-marketing-community/integrated-marketing-definitions/ [Accessed 25 03 2018].

Gil, P., 2017. *6 Hot AI Automation Technologies Destroying And Creating Jobs.* [Online] Available at: https://www.forbes.com/sites/gilpress/2017/07/29/6-hot-ai-automation-technologies-destroying-and-creating-jobs/#6ded30fa6b13 [Accessed 26 02 2018].

Greene, J., 2017. *4 Big Benefits—And Hurdles—of Artificial Intelligence in ITSM.* [Online] Available at: https://www.cherwell.com/blog/4-big-benefits-of-artificial-intelligence-in-itsm-and-a-few-hurdles-too [Accessed 24 03 2018].

IBM, 2018. *What is cloud computing?.* [Online] Available at: https://www.ibm.com/cloud/learn/what-is-cloud-computing [Accessed 01 03 2018].

ICT Standard Forum, 2017. *IT Standard for Businesses.* [Online] Available at: https://www.itforbusiness.org [Accessed 06 03 2018].

Merriam-Webster. 2018. *Dictionary – Concept.* [Online] Available at: https://www.merriam-webster.com/dictionary/concept [Accessed 24.04.2018]

Lake, L., 2017. *A Beginner's Guide to Marketing.* [Online] Available at: https://www.thebalance.com/what-is-marketing-2296057 [Accessed 25 03 2018].

Ostdick, N., 2016. *The Evolution of RPA: Past, Present, and Future.* [Online] Available at: https://www.UiPath.com/blog/the-evolution-of-rpa-past-present-and-future [Accessed 27 02 2018].

ServiceNow, 2018. *Benefits of the Cloud.* [Online] Available at: https://www.servicenow.com/content/dam/servicenow/documents/whitepapers/wp-benefits-of-cloud.pdf [Accessed 24 02 2018].

ServiceNow, 2018. *Meet the Fastest-Growing Enterprise Software Company Over $1 Billion.* [Online] Available at: https://www.servicenow.com/company.html [Accessed 24 02 2018].

ServiceNow, 2018. *Solutions by Category*. [Online] Available at: https://www.servicenow.com/solutions-by-category.html [Accessed 25 02 2018].

Sipilä, J., 1995. *ASIANTUNTIJAPALVELUJEN TUOTTEISTAMINEN.* 2nd ed. Porvoo: WSOY.

Toggl, 2018. *Marketing Mix: The 4Ps of Marketing For Businesses.* [Online] Available at: https://toggl.com/marketing-mix-4ps/ [Accessed 02 04 2018].

UiPath, 2018. *About us.* [Online] Available at: https://www.UiPath.com/about-us [Accessed 27 02 2018].

UiPath, 2018. *Orchestrator.* [Online] Available at: https://www.UiPath.com/orchestrator [Accessed 27 02 2018].

UiPath, 2018. *Robot.* [Online] Available at: https://www.UiPath.com/robot [Accessed 27 02 2018].

UiPath, 2018. *Studio.* [Online] Available at: https://www.UiPath.com/studio [Accessed 27 02 2018].

van Bon, J. et al., 2009. *Foundations of ITIL V3.* 1st ed. Amersfoot: Van Haren Publishing.

Watts, S., 2017. *6 Benefits of ITIL*. [Online] Available at: http://www.bmc.com/blogs/6-benefits-of-itil/ [Accessed 24 02 2018