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HOW TO IMPLEMENT A RAAS PLATFORM FROM ITIL® V4 POINT OF VIEW

Case: Done Robotics Ltd

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TIIVISTELMÄ

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Tämän opinnäytetyön tarkoituksena oli auttaa startup-yritys Done Robotics Ab Oy:tä organisoitumaan ja valmistautumaan palvelemaan tulevia asiakkaita. Done Robotics on kehittänyt oman tuotteen ja suunnitellut aloittavansa palvelun tuottamisen sen avulla. Yritys on työskennellyt jo vuosia tuotteen valmistuksen parissa. Näiden vuosien aikana yritykseen on vakiintunut käytänteitä, jotka eivät sellaisenaan sovi yhteen palveluntarjoamisen liittyvien käytäntöjen kanssa.

Tässä työssä arvioitiin yrityksen päivittäisiä toimintakäytänteitä. Arviointia ja sen pohjalta tehtyjä analyysejä on käytetty pohjana suunnitelmalle, jolla yhtenäistään yrityksen toiminta Information Technology Infrastructure Library (ITIL®) -käytäntöjen kanssa yhteensopivaksi. Työhön sisältyi yrityksen kehittämien käytänteiden rajaamista ITIL® käytäntöjen mukaisiksi kokonaisuuksiksi ja näin helpottaa uuden yritysrakenteen tarpeiden tunnistamista, pohjautuen kaikkeen käsillä olevaan tietoon. Näiden tietojen avulla voitiin perustaa vähimmäisvaatimustuotteen (Minimum Viable Product, MVP) RaaS-palvelulle. MVP RaaS palvelun suunnitteluun liittyi siirtymäsuunnitelman yhteissuunnittelu ja uusiin vastuisiin liittyvien asenteiden valmentaminen.

Opinnäytetyön odotuksena oli, että yritys alkaisi sovittaa toimintaansa ITIL® v4:n parhaisiin käytäntöihin uudelleenjärjestämällä roolinsa ja integroimalla olemassa olevan resurssipoolinsa uuteen organisaatioon, joka pystyisi tukemaan Jatkuvaa toimintaa. Seuranta tehtiin 6 kuukautta viimeisen valmennustilaisuuden jälkeen, ja haasteista huolimatta yritys valmistautui pilottiprojektiin testatakseen ja kehittääkseen palvelua yhdessä tulevan asiakkaan kanssa. Tämä organisaatio muutos voi kestää useita vuosia, organisaation koosta ja aiemmin vakiintuneiden käytänteiden juurtuneisuudesta riippuen.

Avainsanat Startup, ITIL® V4, MVP, RaaS

ABSTRACT

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The purpose of this thesis was to assist a startup Done Robotics Ltd with transforming their organization to prepare the company for upcoming customer onboarding. This company has been developing a product of their own and has been planning to start producing a service using the developed product. The startup has been working on fabricating the product for years and has established practices that are not directly compatible with practices related to service provision.

In this thesis, the company's daily operation practices were assessed. This assessment was analyzed to establish a baseline for further plans to align the compliance with Information Technology Infrastructure Library (ITIL®) practices, which included documenting and limiting scope of established practices and merging them with ITIL® practices needed to establish a Minimum Viable Product (MVP)-service, co-designing a transition plan, and coaching a new mentality that comes with new responsibilities.

The expected outcome was that the company will start aligning its operations with ITIL® V4 best practices by reorganizing their roles, while integrating their existing resource pool into a new organization that can support Continuous Operations. A follow-up was made six months after the last coaching session. Despite challenges, the company was getting ready for a pilot project to test and co-develop a service with a potential future customer. This organizational change can take many years, depending on the size of the organization and how deeply rooted the previously established practices are.

Keywords Startup, ITIL® V4, MVP, RaaS

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1 INTRODUCTION

In the world of startups, there is a concept called “Death Valley”. It is the critical period when the company must organize their operations in a way such that they can start earning their own income before the initial investment has run out.

Done Robotics LLC is a Finnish start-up that was founded in 2020 with the idea of making robots for people. Done is focusing on sanitation and healthcare because they think that these fields deserve more attention in the modern world (Done Robotics Oy Ab, 2023).

Done Robotics LLC has been developing their own modular robot and after two years of trial, error, and success now they felt ready to progress to the piloting phase. During the initial assessment of this company, it was determined that it had become purely a research and development organization, concentrating on developing a functional robot over time. Also, there was a lot of unrefined documentation that was not being fully utilized.

This thesis explores the implementation of the fourth revision of ITIL® best practices in a startup environment, where ITIL® is used as a solution for establishing fundamental practices for creating an MVP version of Robot(ics) as a Service (RaaS) platform. The platform is specifically designed for utilization of an internally developed robotic solution. A RaaS platform means that the company uses a robot to provide a value adding service in some shape or form. (Biba, 2022)

In this thesis the process of transforming established company practices was analyzed with the purpose of Done Robotics LLC becoming a service provider. This involves using ITIL® v4 methodology as a guideline to estimate costs of providing a service in advance and to create a sturdy starting point for specialized long-term commitment to research and development efforts. In ITIL® these efforts are manifested in the Problem - and Change enablement practices. Change enablement is

not there to fabricate random changes, but rather to make sure that the inevitable changes are made with minimal disruption to the production side of the service. In this case a pilot project simulates the first version of the production environment, and work is done in preparation for going live.

It is good to anticipate that going live and continuing the operation over periods of decades will mean learning a terabyte of data, at an interval dependent on Monitoring - and Storage management practices. All this data combined with practiced Knowledge management practices, can then be used in several management practices to refine the process that enables provision of service. An ideal case that can be strived for is a cost effective and efficient, data-driven process. (Agutter, 2019)

Success will be seen in efforts contributed towards achieving success. When designing a service, adhering to guidelines described in books of ITIL® practices gives a way to measure such metrics in each practice involved in operating the service provided. (Agutter, 2019)

1.1 Information Technology Infrastructure Library

The history of ITIL® starts in Great Britain in the 1980s, when Central Computing and Telecommunications Agency (CCTA) realized that their Information Technology (IT) practices were ineffective and costly. As ITIL® was established around the globe, it became obvious that lessons learned here were applicable in any type of enterprise that is providing a service using IT, be it pen and paper or a computer. Thus, ITIL® was born (Mohanakrishnan, 2023). Pen and paper are how people implemented information technology practices long before computers came along, utilizing substantial amounts of paper and ink.

Early adopters of ITIL® framework worth mentioning are IBM and Microsoft, who were already working on their own versions at the time the ITIL® was developed. In the late 80s the first 30 books on ITIL® were published, each detailing several

aspects of running a successful IT operation. Since then, there have been three revisions of ITIL® and the next one is already under work (Mohanakrishnan, 2023)

While ITIL® v1 was the basic research aimed at standardizing IT infrastructure operations

1. The first revision expanded the governance, introduced Information Technology Service Management (ITSM) tools, and made changes to include processes that ensure internal delivery of value. This revision also defined how to develop leadership processes and organizational structure to be more efficient and robust in its operation. A good idiom to describe the first version would be “Keep your employees happy and they will keep your customer happy.”
2. The 2nd revision of ITIL® refined previous contributions to be more comprehensive and emphasized improvements to internal processes, such as Service delivery and Change enablement practices. An idiom to describe third version would be “The only thing that is certain, is that everything will change.”
3. The current version, ITIL® v4 modernized the framework to include practices such as Lean, DevSecOps and such, emphasizing improving service quality holistically by co-designing a service. Idiom here is “With data-driven design it is easy to collaborate.”
4. The next revision of ITIL® is on the way and it is going to emphasize Problem management aspect of service delivery and renew ITIL® s approach to making guides more practical. An idiom for Problem management would be “Because everything is changing constantly, there will always be problems.”

1.2 Benefits of using ITIL®

What companies get for adopting and adhering to ITIL® frameworks is a stable, predictable, and organized operational environment that can nowadays be considered industry standard. The framework gives proven tools and mentality to create required design robust and highly specialized processes that co-operate to establish a service organization. Another benefit is that one can easily outsource parts of clearly defined service infrastructure to established professionals. This is used to reduce the workload to less demanding management of 3rd party relationships. It allows the company to concentrate on improving the product, while maintaining its value. The preservation of value is achieved by providing enough transparency, this should be implemented in accordance with updated ITIL® best Information security practices. (Agutter, 2019)

For customers, ITIL® framework gives predictability and a way to influence outcomes without resorting to guesswork. Traditionally service providers just designed whatever they thought was needed, then sold that. This led to customers paying for extra value propositions that they did not need or want, along with those value propositions that they needed.

In some cases, service providers concentrated so much on these unwanted features that they eventually lost a considerable number of customers. The most commonly known example of this, in the field of providing a continuous service, was Microsoft product MS Office 97 with the Clippy feature. According to one analysis Clippy was designed by developers for the developers themselves, without asking the customer “what do you want?.” (Cassel, 2019)

In ITIL® adhering to the principles of co-designing the service ensures that customers keep getting the value out of their paid services, in a way that is clear for all stakeholders from the start. This co-designing is ideally like a co-authoring process

but can also be reduced to a review process for scientific publications. Co-designing is an ongoing process that provides the customer with flexibility to keep the service current over time and gives the service provider opportunities to expand operations naturally. Here 'naturally' refers to seemingly never-ending progress of technology. Every new technology or improvement of old one is a cause for stopping to consider, how will this impact the value of a service provided (Agutter, 2019).

2 ITIL® METHODS USED IN THE PROJECT

Done Robotics has been doing the right things up until now and had most of the tools needed to start a service. However, the organization did not have a complete role-infrastructure or understanding of requirements of the next organization model.

When the infrastructure of Done Robotics was designed, a significant amount of consideration of all the hardware and software aspects was done. The roles of people maintaining these things had been more of a reactive afterthought. Role-infrastructure is an abstract concept of how ITIL® operates in practice, depicted in the ITIL® Process Map below.

ITIL® Process Map

The ITIL® Service Lifecycle

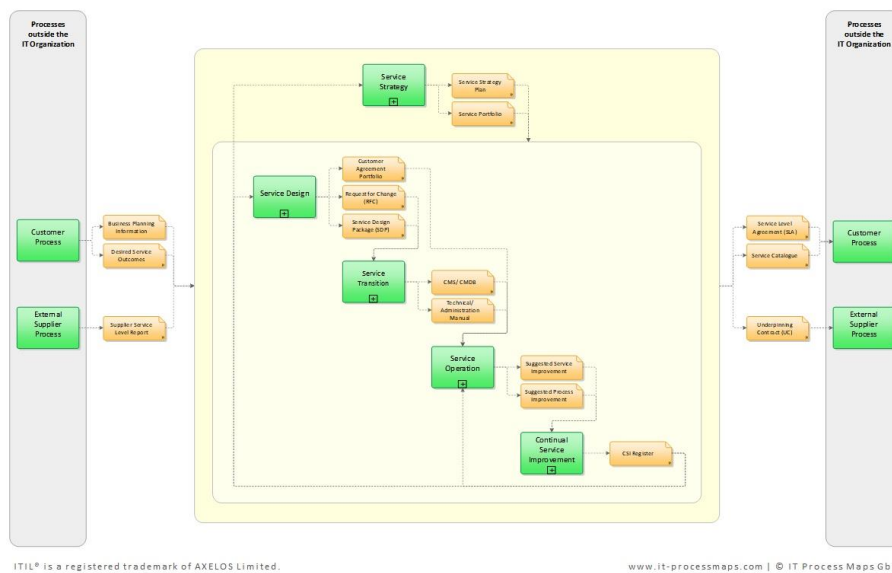


Figure 1 ITIL® Process Map - The ITIL® Service Lifecycle

Understanding Role-infrastructure is required for achieving a capability to utilize available resources effectively and efficiently while implementing a RaaS Continuous Service. How this utilization of resources happens is determined by Service

Strategy. The Service strategy determines which services are provided and that determines the market where the company will operate. What Done Robotics had so far, was a humble vision of "we want to make a cleaning service using our robot." This only defined the market but did not provide any insight into which services to offer.

The ITIL® way is a cyclical construct, emphasizing continual and strategical improvement, as seen in Figure 2. Using Service Strategy as guiding principles, the enterprise is supposed to advance in consecutive stages that refine the service through repetition. ITIL® also provides its own guiding principles on how to choose and refine them to account for the effect of the changing environment over time.

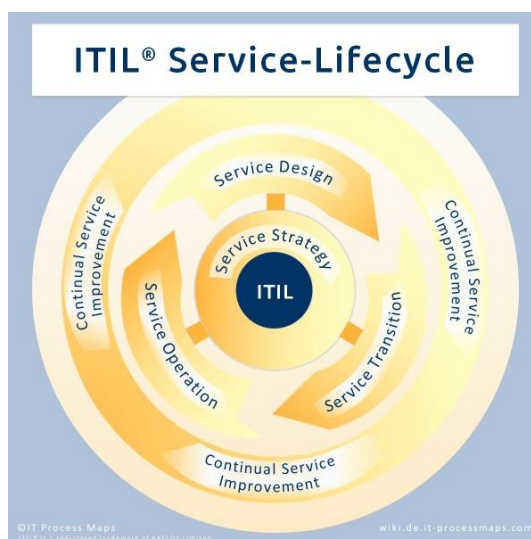


Figure 2 ITIL® Service-lifecycle

In this thesis, the five project implementation steps found in the ITIL® Implementation guide (Kempter S. K., 2019) were redistributed into a 3-stage process to match the Service-lifecycle as follows:

1. The Service Design stage is the stage where information is gathered, and everyone is brought on board. Key players are identified, and plans are made with them.

2. The Service transition stage is where those previously made plans get tested and adjusted to match the encountered constraints of reality. In this stage the MVP prototype is finalized, and the user manual development is started. Usually, companies like to have this stage happen as fast as possible. It is good to do testing here to make sure that updates/upgrades succeed. User training concludes the Service transition stage.
3. The Service Operation stage reveals how the service works and what to do in the next iteration of the eternal revolutions of Continual Service Improvement.

Data generation rate is most intensive in the Service operation stage. This is where monitoring solutions give feedback on the health of the service and what needs to be done to improve it. Obviously, users also contribute a lot of useful feedback, but that sometimes needs a translation. The company can start to predict the true costs of the service once it has operated continually for a year. During the piloting, this period is as long as needed, but once production stability is achieved and monitoring is optimized for efficiency 1 year of uninterrupted data is preferable.

If it is already known that the enterprise is technologically and business wise on solid ground, it does not really matter at which stage of the company lifecycle the ITIL® onboarding process is initiated, but general practice is from the start. In this instance, solid ground means that the company has resources capable of operating the required infrastructure to provide the service and has at least one customer who has agreed on a pilot project.

Once assessments had been made in Service Design stage over a period of three months, Service transition was implemented through several workshops where Knowledge management practices were established to initiate the transition. Also, the ITIL® process map was purchased to ease the transition with helpful interaction models that show how practices interrelate and drill down to the lowest of

responsibilities. This process map also contained helpful examples of important documents such as agreement templates.

The purpose of the Knowledge management -workshops was twofold. First, it was designed to prepare the staff for the eventual transition to ITIL® practices. Secondly, it was to start documenting the content of established practices, namely the individual processes contained within said practices. These recordings will be used later as work documents that help new recruits to settle into their new environment.

The Service operation stage was planned to be a pilot project where the company intended to put these lessons into practice while continuing to develop their service.

It was decided to use an ITSM solution that Done Robotics have been using to organize, namely Asana for project communication, task tracking and documentation. Some task assignments were also implemented using email as an example of alternative ways to exercise request fulfilment -, incident management - and problem management practices through a series of assignments that represent such scenarios.

The Deliverables of Service transition stage was a collection of documented practices and establishment of new practices. The completion of this stage is defined by the handover of the robot-service to the organization that has commissioned the pilot project.

Documented practices are the collections of actions performed during daily operations. When information is collected appropriately, it will be known how long it takes to perform each task and if a specific task requires involvement with other stakeholders. This deliverable is also the recipe, it describes how the organization works and thus must be protected like any other intellectual property.

Not sharing the company Knowledge database with the public is an Information Security practice. If a company cannot tell the difference if an action was performed in a production environment by their employees or outsiders, security incidents will go unnoticed. (Agutter, 2019)

Due to incompatibility and security reasons the contents of the Knowledge database and any specifics about practices developed during this thesis work will not be discussed. Instead, the thesis will describe the onboarding process of ITIL® methodology that enables the provision of any type of service, which is in this case a RaaS platform. The documents in the appendices are not considered a security threat because this information is already outdated and generalized.

By not revealing the content of developed practices a company has a layer of protection from various threat actors. Because Solution databases may contain administrative login information and procedures to make things happen internally. This information is very crucial in Security - and Incident management practices. It enables the investigations to have the capability to exclude internal actors with legitimate access from being a subject of further investigation. With good Knowledge management practices, the process of elimination can happen quickly, thus significantly impacting the time to resolution in a more desirable way.

It is also noteworthy to mention that ITIL® comes with its own set of professional terminology that have their own specific definitions (Agutter, 2019). ITIL® syntax was developed, and its meaning has been refined over the three decades, meaning that there is a considerable amount of ITIL® jargon to learn. Some of this syntax can be found in the reports attached in the appendices, a glossary aptly named "ITIL concepts." Because ITIL® is an established school of thought, one can also simply ask Google or ChatGPT with a prompt: "define Service + ITIL v4". It is a good practice to do this when exploring meanings of Capitalized words in ITIL related conversations and documentation.

3 RESULTS

ITIL® uses several ways to measure progress. In this project a qualitative analysis of deliverables was used to show results. Here the progression of each stage will be summarized also using available attachments as reference material.

3.1 Service Design

In this project RaaS was defined as a type of service where a value is provided to a customer by automating a task with a robot and an on-call-maintenance service for said robot, packaged as a Minimum Viable Product (MVP) Service Offering.

The Service design stage had following deliverables:

- Report 1 - RaaS Current state of business at Done Robotics
- Report 2 - RaaS Vision of MVP infrastructure and organization
- Report 3 - Lifecycle of RaaS-platform from point of view of infrastructural organizational changes

These reports can be found in the appendix. During the service design stage, it was realized the company had been concentrating solely on the development of their robot and thus, had evolved practices to serve this purpose. These practices were identified and added to the tracking list.

In this stage a roadmap to transform the company into a RaaS organization was drawn as a Gantt chart (Appendix 3) containing explanations of what each practice does. This chart depicts timelines for documenting existing processes and learning to document progress of daily tasks in a way that documentation would be useful for future Service desk practices. Goals were to reinforce existing practices and establish new ones that will be necessary for the Service operation stage.

In addition, the company acquired an ITIL® Process map with templates describing an example of full-service organization (Kempter S. K., 2019). In practice, many companies in a global market rarely acquire full-service, in favor of making temporary or tactical savings when conditions allow. These Process map templates were used in the Service transition stage to guide the creation of needed documentation for the company Knowledge base.

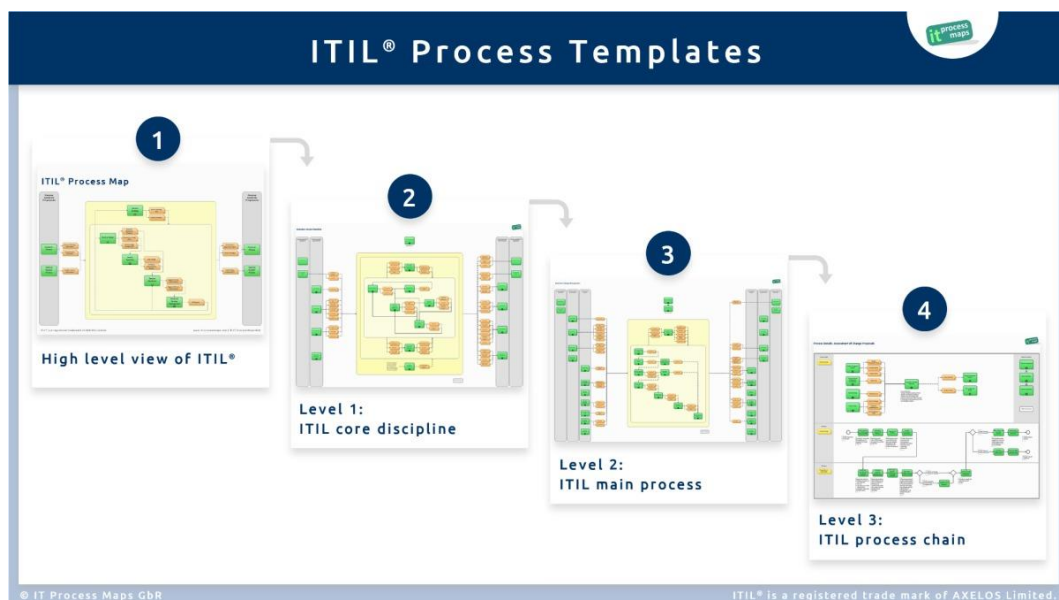


Figure 3 ITIL® Process Templates

In creating Knowledge base documentation, the following example structure was used according to ITIL®, depicted in Figure 3 . This documentation is the description of the whole infrastructure of a service.

The service design stage will define the resource requirements and thus will help in estimating the final costs of daily operation. In a Service Level Agreement (SLA), it is later agreed with each customer what the price of the service would be and how much extra needs to be paid for each executed extra task. This extra usually comes from value-adding practices such as Security, Change, Request, Incident

and Problem management. The rest of the practices are the fundamental fabric of the company, and their existence and lack thereof will influence how well the value-adding practices perform.

This fundamental fabric can be constructed from completely internal practices or outsourced. For example, it is currently a popular practice among startups to have Facility management practices outsourced, because the local Startup hubs provide it for free. Once the company owns the property in which it operates, then the Facility management practice will be required to be included in the internal management of the company, to keep the Service operational. The fundamental fabric will be discussed in more detail in the next chapter.

3.2 Service Transition

The Service transition stage was implemented using the existing company infrastructure, as they were already using Asana as their ITSM. Initially, a period of six months was reserved for this stage as there was a lot to do but this work could not interfere with daily operations.

As was mentioned in the Methods section of this document, there were steps that needed taking to achieve the main goal. The steps were taken with the aim of reinforcing existing practices and establishing new ones. The reinforcing of practices was done by identifying target groups of people responsible for Architecture, Supply, Knowledge and Continual improvement management practices and engaging them in a series of workshops. In ITIL® Continual improvement is a practice shared by all stakeholders (Agutter, 2019). These workshops aimed to improve existing knowledge management practices. The existing processes were also documented.

Earlier, each practitioner had been implementing a “do whatever is needed, to make things happen” -approach with minimal to no documentation of what was

done or how long it took. Some practitioners had an overlapping range of responsibilities to accommodate existing resource constraints; this increased the challenge of separating practices from one another for such a practitioner.

The workshops consisted of lectures, guiding tasks, and questions. The guiding tasks and questions were designed to be compatible with the practices developed during the Service transition stage.

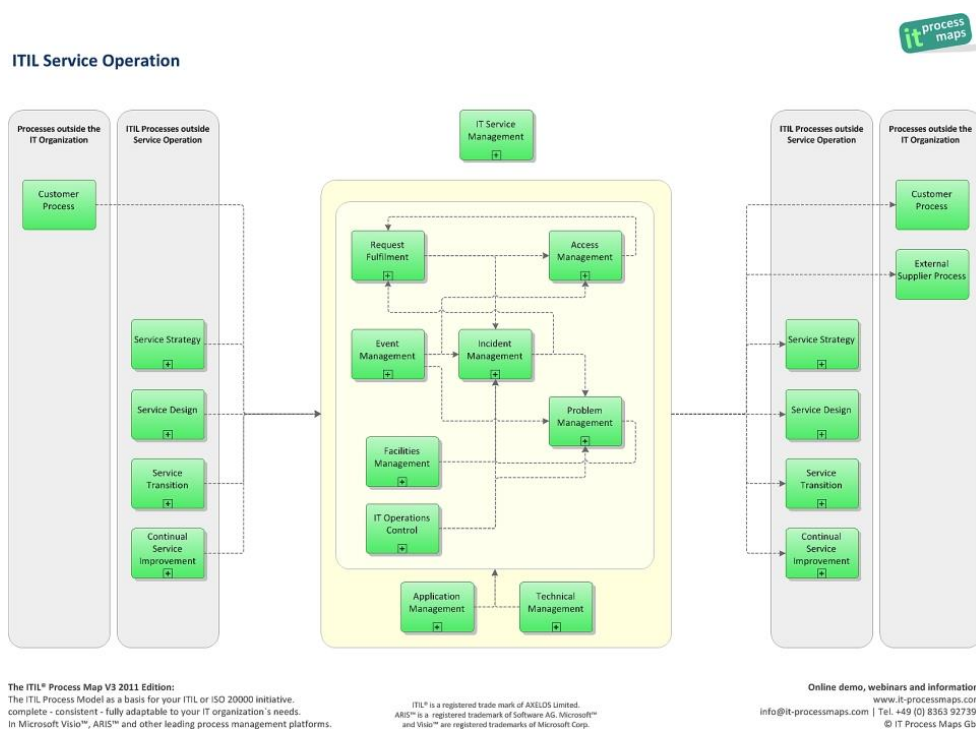


Figure 4 ITIL® Example of Service Operation model

Service Operation templates were given to the architects to help them visualize the goal, depicted in Figure 4, the arrows indicate interactions from a point of view of deliverable interactions for operational stage of the ITIL® Service-lifecycle. In the Design stage, it was also identified that there were three distinct Architecture designs already established in the company: Robot Hardware (RHW), Robot Operating System (ROS), and the Backend of the service (BES). Only the Backend architect had a Roadmap that defined what should be done and in which order.

In practice, this type of situation where Architectures are not aligned with the company roadmap, example depicted in Figure 5, it creates silos that are developing their own distinct products. Silos can lead to unexpected tasks that appear in the middle of a sprint, slowing down overall progress.

1. Make, use and maintain a Roadmap of your product regularly.

A product roadmap is a high-level visual summary that maps out the vision and direction of your product offering over time. A product roadmap communicates the why and what behind what you're building. A roadmap is a guiding strategic document as well as a plan for executing the product strategy.

It could be as simple as following strategic roadmap is, for a company:

Startup stage: choosing a problem

Solution stage: researching the market and business analysis, preliminary solution draft
R&D: developing a solution. A MVP-template(a bare bone solution that Just Works and can be customized later) while looking for potential customers. Effectiveness first, efficiency later.

Piloting: Working with customers to develop a product, a Robotic solution as a Service in this case, for this customer from your MVP template, develop supportive services(service desk, on-site, 3rd party infra e.g. internet). Finish and polish, this is where initial efficiency optimizations come along. Goal here is to collect expectations and use that to win customers' trust and secure a binding service contract for x years ahead.

pre-Industrialization: If customers really want our product in abundance consider redesigning the product to be producible/usable at scale that is expected of hardware and software. Capital is easy to get when there are customers who are contractually bound to buy your services.

Industrialization: Ramping up the production from one device at a time to mass production, Continuous Improvement of supportive services.

Rollout: A service is finalized and delivered to the customers, customer education begins(how to use the product and its support services most effectively and efficiently)

Continuous Services(RaaS): Maintain operational level and service level, continue to co-develop the service with the customers. Use the existing customer base as a portfolio to get new customers, pivot the product to expand and diversify the portfolio.

Figure 5 An example task from an Architecture management workshop

One of the example questions for documenting Supply management practices and building a Solution database was: “What needs to be done when you contact a supplier X and they say, I don’t have it?”

Name ↑	Last modified
ITIL Implementation of Done Robotics	Mar 27, 2023 T
Process mapping	Mar 20, 2023
2022-10-26_Report 1 - RaaS Current state of business at Done robotics.docx	Jun 20, 2023 h
2022-10-26_Report 2 - RaaS Vision of MVP infrastructure and organization (1).docx	Jun 20, 2023 h
2022-11-08_Report 3 - Lifecycle of RaaS-platform from point of view of infrastructural_organizational changes.docx	Jun 20, 2023 h
2023-02-09 ITIL Implementation 2023	Sep 21, 2023 TI
2023-03-27_ITIL_process inputs and outputs	Jun 20, 2023 h

Figure 6 Deliverables of Service transition phase

Figure 6 presents a collection of folders and documents that Done Robotics has created for this project. These are working documents and documentation at same time. A working document is an interface between knowledge management practice and other practices. It means that practitioners are using this type of document in their daily work to make sure that they are working with the most current and relevant information while Knowledge management makes sure that these documents have the most current and relevant information.

3.3 Service Operation

In Service Operation Stage the service provider must shift focus from continual improvement to keeping the achieved operational status of a service as stable as possible. This means that changes made to the service at this stage are minimal and made only when absolutely necessary.

As this project was implemented in a real-life scenario, the initiation of the Service operation stage had been delayed by changes in the resource pool, which impacted the overall timetable. Every time a new practitioner needs to be trained, it will take at minimum several months for them to learn new rules and responsibilities effectively enough to significantly reduce the negative impact on the deliverables of that position.

Due to time constraints of this thesis, documenting results of Service operation stage has been omitted from the scope. However, Service Operation stage is explained in more detail in the analysis chapter of this thesis.

The plan here is that during the piloting of the Done Robotics robot service, the first iteration of Service operation stage will be performed. This is a stage where R&D gains focus. During this stage, Done Robotics will have several adjustment meetings with the customer representatives and users to make data-driven decisions that will shape the service and may even result in amendments to the agreements. These meetings are called Change Advisory Board (CAB) meetings, they can be regular meetings or held when needed. Typically, a scheduled CAB is a meeting for technical people where planned, scheduled, and unplanned changes are proposed, discussed, and approved/rejected. Ad-hoc CAB meetings are always unplanned and can discuss emergency changes as a response to a major incident or changes proposed by the Problem management or the Sales team. According to ITIL® Change enablement practices, any changes to the production environment must be made with minimal interruptions to established daily operation and with approval from all stakeholders. (Agutter, 2019)

4 ANALYSIS

There are dozens of books on how to implement ITIL®. In this project, foundational knowledge was used, complemented with personal experiences of various ITIL® implementations ranging from company infrastructures to city infrastructures.

Organizational changes are simply instruments to interrupt inefficient, incoherent, or insufficient practices and improve them. Through Knowledge management practices it can be determined what is the case and how to go about improving the organization.

Organizational changes are also brutal testing grounds for resilience of a company, people will be made redundant, people will leave or will become less effective due to a piling of new responsibilities or simply anxiety due to loss of co-workers. Managing and mitigating those challenges will always require considerable effort. In this thesis, this subject is out of scope, but it is important to mention it, as this appears to be akin to a law of nature.

4.1 Choosing ITIL® Practices

It is always important to have a vision of what a company is going to be doing in the future, to determine what practices are actually needed for the success of a particular enterprise. There are still some practices that are universal, such as Knowledge, HR, Financial, Incident, Change management practices that will be needed no matter what service the company provides.

When thinking about the service provided by a robot as an iceberg, the robot is the tip, while the Service desk is the hidden part of the iceberg. Because the robot is what the users see and interact with on daily basis and if everything is working as expected, customers interact with the service desk as little as possible. The Service desk also functions as a Single Point of Contact (SPOC) for all matters related

to functionality of the service. This function is visible to the customers and users too.

A fully functional Service desk consists of several main practices:

- Architecture management
- Measurement and reporting
- Risk management
- Information security management
- Knowledge management
- Relationship management
- Supplier management
- Service level management
- Availability management
- Capacity and performance management
- Service continuity management
- Monitoring and event management
- Incident management
- Service request management
- Problem management
- Release management
- Change enablement
- Service validation and testing
- Service configuration management

Many of the listed practices can be scaled down and assigned to multirole positions. Some of them can be fully automated in some of the ITSM solutions available on the market.

As done in this project too, selecting fundamental fabric practices should be done based on the actual needs of the company at the time, even within the Service desk. For example, in the piloting phase Incident management, Problem management and Change enablement practices can temporarily be assigned to the same person who was the architect of the service providing robot and understands everything about it. (Kempton S. K., 2019)

Let us take the above situation as an example of an event that needs to be handled by a Service desk. If too much workload is applied to one person for a long period of time, the situation will become unbearable sooner or later. Then another person will be needed to assume one or at worst all the responsibilities and will inherit all ongoing cases related. It is vital to understand here, the moment when a situation has become unbearable, it is the time when the incident occurred. This is vital information to help resolve any type of investigation and sometimes this information needs to be found separately. ITIL® defines unbearable as unplanned interruption or reduction in quality of an IT service.

It is also noteworthy that not all practices are equal. During the Service Operation stage some operate with the highest mandate. For example Incidents must always be managed as soon as possible, but within a defined SLA and according to priority. Otherwise, the agreed penalties start impacting the income produced by the service.

According to ITIL® best practices, the customer predefines the Incident priority scale in the SLA, but any incident can be elevated in priority if needed or if the customer says so. When an incident repeats, the Problem management practice steps in to get a Root cause analyzed with an outcome of a solution. Once the Root cause is analyzed, the problem management together with the Change enablement select the best permanent solution and implement it.

Major incidents and Security incidents are always the highest priority, which also means that after such an event has been resolved and production operation has been restored, there is always a Root cause investigation to make sure that this will not happen again. (Agutter, 2019)

Each one of the main practices has sub-practices that can be as simple as changing a lightbulb in the office but also assembling different parts of a robot, updating a server, or handling a request for a change advisory board meeting. There could be thousands of practices depending on the complexity of a company and requirements imposed by the customer, regulators and chosen industry. Maintaining that amount of information and data can become cumbersome over time.

4.1.1 The Big Picture

Paraphrasing ITIL® core principles “To get to where you are going, you need to know where you are starting from. Only then you can build a roadmap to the destination.”

A roadmap is a tool that is usually projected for a project, which makes it an equally valuable tool for laying out the vision of what is needed for creating a continuous process. In ITIL® thusly created big picture is made into an ever-evolving entity that can be nimble in the face of change. Change that time and environment inevitably imposes on a company. (Figure 2 ITIL® Service-lifecycle, 2018)

Here, choices should be regularly made that align long-term commitments with the changed operational environment. Political, natural and competitor landscape provide plenty of variables to manage. As an example, recent global developments have inserted questions such as “what happens to the production if a war or corona shutdown starts in country X? X being any country where you operate in any capacity.” into risk management plans.

ITIL® v4 has thirty-four management practices (Kempter S. , 2022) that are grouped into three categories:

- General management practices
- Service management practices
- Technical management practices

For this project, this grouping has been further simplified into two categories Fundamental fabric practices and Value adding practices. Fundamental fabrics are the practices that are absolutely necessary to operate a service, for example, HR, Accounting, Legal, Service desk management practices. Value adding practices are practices that can multiply the income produced by the service. This value can vary depending on complexity, size, and age of the system. It is also important to understand that with great service comes great responsibility. This manifests in SLA penalties that are imposed on the service provider, should the practices providing the service be mismanaged. In this respect ITIL® is like a double-edged sword, the transparency and clarity that it provides also makes it practically impossible to hide most forms of foul play, when both customer and service provider have ITIL® certified practitioners employed to manage the service. (Agutter, 2019)

4.1.2 Breaking down the Big Picture into Manageable Chunks

The roadmap of this project contained practices that needed to be adopted as soon as possible (Gantt chart in Appendix 3). The order of practices to handle were chosen based on the existing company plans that included finishing the robot MVP and identified requirements for starting a pilot project using this robot as a platform that provides an MVP service.

After aligning established Knowledge management practices with ITIL® methodology, the first practices to document were Architecture management and the Supplier management practices as they already existed in some primordial form. Here

the task was to make sure that practices are aligned with the plans and strategy of the company. These two practices were selected because they are the most influential practices on how this project is going to progress. The practices affect all the deliverables of the whole organization because they operate at the interface of Vision and execution. A simple decision in the Architecture management, for example, “what operating system to use in workstations vs servers?”, can influence workloads for several practitioners down the line. Technological capabilities, available documentation and support can make all the difference. If both workstations and servers are of the same Operating system environment, this means less work in general. On the other hand if the workstation and server infrastructure are running a different operating system, then any changes to the whole system will need extra attention but can bring benefits in the form of increased information security.

Further down in the Gantt chart, there were practices that the company did not yet have, such as Service desk. These practices were explained sufficiently in the ITIL® Process Map and can be adopted as is as soon as practitioners are hired to start refining these practices to bare necessities in a data-driven way.

4.2 Knowledge Management

Knowledge management practice is like the One ring in the Lord of the Rings saga, it is the glue that rules it all and, in the background, binds it. When correctly implemented, Knowledge management enables smooth operations of a company, giving everyone clarity and ensuring repeatability no matter the circumstance. Knowledge management documents everything about the company that is relevant to the Service Operation and refines this data into actionable information.

The content of each practice can be found in various ITIL® publications devoted to each practice. That said, ITIL® does not impose a specific way of performing each

practice, but rather gives tools to develop unique practices that work. It shares experiences and shows various solutions that have withstood a test of time. ITIL® also explains why those solutions worked as they did, in a holistic manner and emphasizes that direct copy is a perilous endeavor because, each company is its own ecosystem, having unique limitations, culture, and product. This uniqueness defines the final content of the practices complemented with roles and responsibilities of practitioners for each company.

4.2.1 Building a Knowledge Base for Any Practice

Knowledge management constantly monitors and adjusts all the processes with frequency determined by complexity of the documented processes and frequency of changes in organizations of all stakeholders, depicted in Figure 7. This data-driven way of maintaining a Knowledge database helps the service providing company to maintain the value of the service. Good documentation practices also enable the use of metrics. This will make daily tasks predictable and makes it easier to identify situations when changes are needed.

For a startup, such as Done Robotics with established practices, building a Knowledge base can be done easily by starting with mapping and documenting sub-practices for each main practice. But unlike a startup that is just beginning its journey, this work can be done by hiring a professional Knowledge manager, who can then comb through existing work documentation to create the whole Knowledge base. Otherwise, extra time and effort from available resources, that already have plenty of planned work to do, will be required.

For startups that start from nothing, an initial Knowledge base can be built by using tools such as ITIL® Process Map and then refined for the purpose. This allows designing all the selected features of ITIL® into the company culture from the beginning removing the need to unlearn previously established practices.

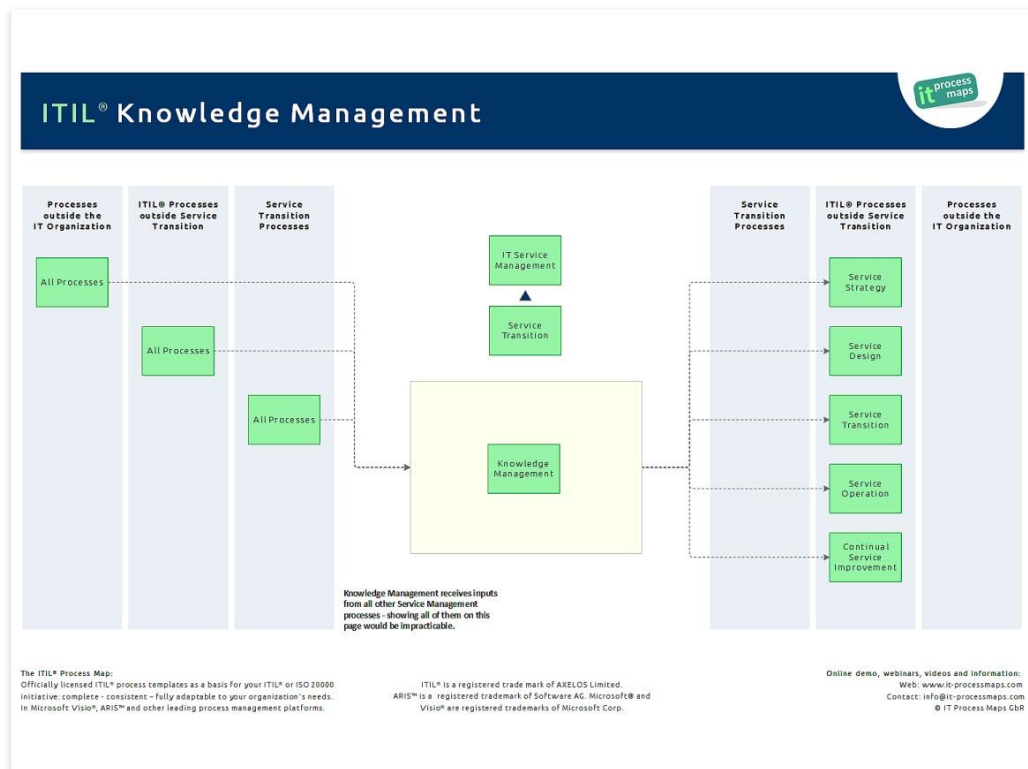


Figure 7 ITIL® Knowledge management

The process of making a Knowledge base will inevitably bring initial resistance to change inside the organization, because of the meticulous nature of documentation work, but people will soon notice that making documentation is a skill to learn. At first it will feel like it is slowing down all operations, but in fact it is doing the opposite by clarifying and quantifying the content of each task and leaving instructions on how to solve similar situations.

4.2.2 Anatomy of a Knowledge Article

It is important to acknowledge that the first drafts of knowledge articles do not have to be complete articles because they will be refined later, in daily use of each Knowledge base article. This gives freedom to concentrate on things that matter and ensures that even if the responsible practitioner becomes unavailable, their substitute can perform same tasks with ease and learn while doing.

The idea can be epitomized in the following sentence: “By making yourself replaceable with good documentation, you make yourself more valuable by proving mobility capabilities.” This ensures possibility of mobility between each main practice branch when needed.

Some companies do not hire a knowledge manager and think that they can get away with everyone maintaining their Sdb. But this is not the case, because here practitioners are wasting time on tasks that are not meant for them when they should be doing the tasks that are. This time waste can accumulate into a significant backlog of unresolved incidents and expenses that can ruin the company.

The main content of a Solution Database (Sdb) is processes developed in individual practices. These processes can be developed already during a Service transition stage using tools provided with ITIL® Process Map, for example, the Responsibility assignment matrix (RACI) and answering to the following basic questions: “what do we do/don’t do”, “how to do X”, “what to do when Y happens in A, B or C”, “what do you need to know about X before doing Y” and lastly “Who does what and when to contact them”.

The answers to above questions become refined information that goes into an Sdb and forms the user manual for the infrastructure of the whole company.

Following is an example article that could be found in the Sdb:



Encrypted email

Priority: Low, Medium, High or MIM

Who can send: *Service desk agents*

When to send: *intellectual property, personal identification information, password, or username (send separately), etc.*

How to send: *before sending, check if recipient is approved*

1. *go to Email-client*
2. *in Message-drop down menu, select icon of a lock* 
3. *compose email*
4. *Click send button* 

Approved recipients: *emails in following domains @companyA.fi , @companyB.fi*

The color coding of the subtitles and a clear division of content is a knowledge database optimization technique designed to speed up readability by a human. Information is stripped down to essentials. These are but a few of the optimizations that can be implemented for solution databases. It is crucial to update these database articles when changes to the infrastructure are made. For example, security practices can influence rotations of new policies on who can send and/or even receive encrypted emails. Alternatively, from a technical point of view this could be a change in transport medium for example, from the Outlook workstation application to the browser version or vice versa.

Working Sdb documents contain information of tasks and contact information of the responsible practitioner appointed to deal with each specific issue relating to each task. The appointed responsible practitioner could be an internal colleague, someone at the customer's side or a third-party operator. One can appreciate the importance of this information staying current, especially when incidents occur, and swift action needs to be taken to resolve the situation before agreed penalties start impacting the income of the service provider. For example, if the Internet Service Provider (ISP) has changed, and the Knowledge base has not been updated in the Solution Database (Sdb) in time. In this case, Security Incident Management

practitioner will be forced to exacerbate the security incident by outdated information, while wasting crucial time tracking correct contact information for the ISP before (s)he can even begin the investigation.

5 CONCLUSIONS

In this thesis foundations for the future development were laid down, as embracing ITIL® fully can be a process taking several years. Thus, it was appropriate that only foundational knowledge was used in this project. It was also noticed that before attempting to replicate this project, having prior experience operating in an environment that had already embraced ITIL® fully, is a must. Because fully understanding each principle requires hands-on experience, preferably with several different IT systems that were set up for different purposes.

One could teach company a practice from another company, but it will most probably fail because those other companies have developed their practices over the years to fit their organizational ecosystem and thus, their practices are not necessarily transferable as is. Each tool that is copied, for example a “in case of zombies, break glass”-arrangement on the wall, needs to be properly grafted into existing infrastructure no matter how realistic the danger is. What is meant by proper grafting is that ITIL® does not forbid copying such details, but instead encourages as a best practice to develop these practices using actively maintained and refined documentation, utilizing experiences acquired while using them. This is called Data driven development.

ITIL® does not give rigid rules, instead it gives guidelines on how to make one’s own rules. The following is the best metaphor to describe what ITIL® is: ITIL® is like a deck building guide of Magic the Gathering (MTG) cards, but for building a service providing company. (Sargeantson, 2023)

Because as in the deck of MTG, the player (a company) that carefully chooses spells (software and hardware), creatures with abilities (practitioners with established practices) and has a good balance of mana (money), will win (persevere).

Similarly to an MTG match, during the Service operation stage data is collected, namely the performance of organization and the product. Using collected data enables making data-driven changes for the next iteration of three staged Lifecycle: design, transition, operate.

Good documentation practices ensure that a next person can work in the same role by using documentation as instruction and succeed at their challenges even if that person may not have acted in this role before.

At this moment, the future of Done Robotics is dependent on how well they are going to co-design their service during their upcoming pilot co-project, but at least now they are going to be co-designing it, instead of just imposing their own views of how the service should work.

This improves the chances that a value will be created for their future customer. When a customer sees value they will pay for it, unless they can get it cheaper or better quality.

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APPENDICES

APPENDIX 1.

Report - Current state of business



Image generated with Dalle 2 using following sentence: a logistics robot is organizing medical equipment in the surgery room.

Introduction	1
Organizational structure	2
Product design	2
State of service	2
Conclusion	3

Introduction

This report is the first part of my thesis work and is meant to establish a starting point for further work. This is accomplished by assessing the current state of business. The report is compiled based on existing documentation provided, by informally interviewing staff and participating in a design sprint.

Definitions:

Metrics

Stage	Maturity definition
1 idea	Solution space has been explored, superficial understanding
2 concepts	Some definition has been done; robot product can be sketched in multiple variations
3 research	Some validation has been researched, possibly interviews have been conducted to gauge customer values
4 vision	Enough validation has been gathered to have an understanding of customer needs, such that the product can be described in detail. Prototypes can be built for customer acquisition.
5 developed	A customer exists and MVP product/service has end user stories to describe the problem and the solution in action, documentation can be designed to cover subjects of upgrade lifecycles and maintenance infrastructure.

ITIL® V4 concepts

Service: A means of enabling value co-creation by facilitating outcomes that customers want to achieve, without the customer having to manage specific costs and risks.

Product: A product is any configuration of an organization's resources designed to offer value for a consumer. Resources can include people, capital, equipment, software, etc.

Service provider: An organization that takes up the role of creating and delivering services.

Service offering: is a description of one or more services that are designed to address the needs of a target consumer group.

Customer: A person who defines the requirements for a service and takes responsibility for the outcomes of service consumption, e.g., the IT Manager.

User: A person who uses services

Continuous Operations Services: Continuous operations are activities within a business that are ongoing and sustained in the event of a business disruption. Continuous operations also describe companies that operate 24/7



Organizational structure

The current structure consists of a CEO and a good collection of departments. This collection is optimized for R&D with members operating in multiple departments according to their know-how and need. Some infrastructure exists, but there are no visible structures resembling organized Continuous Operations, this is possibly a silo. Company has an Agile structure which uses Scrum-methodology for governance and [Asana](#) for task management. Advisory boards exist and is actively used.

HR

Scrum of Scrums Team

Business Development Team

Hardware Team

ROS Team (Robot Operating System)

Web App Team

Product design

The company has multiple projects in the works with most of them being in the stage of Idea. There are currently two products that are closest to development, but they still need a customer and engagement with end users to establish environmental and usage requirements that will affect packaging and functionality of the end product.

A prototype exists, with limited functionality. The company is currently concentrating on expanding functionality while maintaining modularity.

The market is established, and globally existing competing products can be used as reference for an MVP of desirable product/service.

State of service

The company is still designing a product. State of service is still in the stage 1 ideas. Vision needs to be clarified, distilled, and projected onto operations to be a guiding principle and a common goal.

On the positive note, plans are big, wide and ambitions are high. The breadth of plans allows for quick pivoting action, as far as the product is concerned, according to the whims of the market.



During a design sprint I learned that the company is already thinking about how to implement the roll out of the product, but this work is mostly done with internal ideas based on personal experiences of the designers rather than for a specific pre-existing ecosystem. This is far from the definition of designing a service because designers are too tangled in the technical details of the product and thus can't necessarily see the rest of the service or where it needs to be flexible. Resulting in an incomplete and fragmented picture of deliverable outcome.

Conclusion

Company is stuck in the "R&D pit." Meaning that a prototype exists, but more prototypes are being developed internally based on internal values, instead of customer values. Essentially, Done Robotics is currently designing details of a product that no one has asked for. This causes the company to go in circles unproductively and waste valuable resources. Affecting motivation of staff and stakeholders. But it also builds understanding of: "what all things this particular product could be?" giving Done Robotics a competitive advantage in the long run, if this acquired knowledge is actively preserved.

Ideally, Vision should be distilled into one sentence, for [the internal](#) use. While for public use vision should be refined into a collection of user stories with outcomes showing clear improvements to the current status quo.

Service offering considerations can be found in design documentation, but that information is highly fragmented and unrefined. There was also a document where the RaaS-platform was being explored at a high level, but that document is yet unfinished.

While industry standards have been identified and are being researched, standardization of governance and production processes has only started.

RaaS- platform, is right now a product concept with a physical prototype, but without any basic infrastructure to support it.

Next steps for Done Robotics:

1. Refine and clarify vision.
2. Select relevant Standards for operations and Service Offering (ISO standards)
3. Development of internal processes to be compatible with Continuous Operations
4. Generic Service Offering needs to be designed, where basic product infrastructure is also defined.
5. Lifecycle of the product and service
6. Approach customers with a refined solution space that our product can provide.

These next steps will be explored in more detail in the next reports.



In order to provide maximum value, the service needs to be co-created together with the customer once users have defined problems to be solved within their existing ecosystem.

APPENDIX 2.

RaaS Vision of MVP infrastructure and organization

Introduction	1
Robot(ics) as a Service, RaaS	1
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Vision	2
Service	3
Conclusion	4
Sources	4
Appendix	4
Competitor scape	5
Email results	5
Business models	6
Coarse analysis of Competitor scape	6

Quote, ITIL® history:

"ITIL® was developed at the end of the 1980's by the Central Computing and Telecommunications Agency (CCTA), a government agency in Great Britain. The reason for commissioning the CCTA was a lack of quality in the IT services procured by the British Government, and a method had to be found to achieve better quality at lower cost. So the CCTA set out to develop recommendations for the effective and efficient provision of IT services. This resulted in a catalogue of best practices for IT organizations, which today is known as Information Technology Infrastructure Library or simply ITIL®.

Historically, IT organizations were often focused on software, hardware, and other technology, rather than driven by customer requirements. Against this backdrop, the key idea behind ITIL® is that IT services should be focused on client needs, and that organizations explicitly agree the services to be delivered with their customers. This should be combined with effective processes and clearly defined responsibilities for service provision within the IT organization.

During its research, the CCTA found that the requirements of the various businesses and organizations were mostly similar, independent of their size or industry sector. The recommendations compiled by the CCTA are thus valid for organizations of all types and sizes.



A series of books on ITIL® has been issued since 1989 by the Cabinet Office, an administrative body of the government of Great Britain. As of the beginning of 2014, the ITIL® trademark and intellectual property has been owned by AXELOS, a joint venture between the Cabinet Office and Capita Plc™ (Kempter, 2022)

Introduction

This report is the second part of my thesis work and is meant to explore infrastructural and organizational requirements that are imposed on any company that is producing a service according to ITIL® v4. This is accomplished by analyzing the most relevant existing competitors and their service offering in the framework of ITIL® v4. Public sources and email questionnaires will be used, some of the competitors' service offering structures will be speculated.

Robot(ics) as a Service, RaaS

RaaS as a concept was originally presented by the International Federation for Information Processing (IFIP) in 2006. At first IFIP conceptualized RaaS as a software only solution for WEB services, but later as technology evolved, hardware solutions were included in RaaS as well. In this work we are concentrating on the hardware solution space. In a typical RaaS-platform the physical robot is leased to the customer for a monthly/annual subscription while the service provider is taking care of the financial burden of owning, maintaining, and upgrading the leased hardware throughout its lifecycle.

Definitions:

b2b: business to business

b2c: business to client

IT: information technology

ITIL® concepts

Service: A means of enabling value co-creation by facilitating outcomes that customers want to achieve, without the customer having to manage specific costs and risks.

Product: A product is any configuration of an organization's resources designed to offer value for a consumer. Resources can include people, capital, equipment, software, etc.

Service provider: An organization that takes up the role of creating and delivering services.

Service offering: is a description of one or more services that are designed to address the needs of a target consumer group.

SLA: a Service Level Agreement (SLA) is "A documented agreement between a service provider and a customer that identifies both services required

and the expected level of service." Simply put, an SLA defines what the IT service provider and the customer should expect when contracting for a service.

Customer: A person who defines the requirements for a service and takes responsibility for the outcomes of service consumption, e.g., the IT Manager.

User: A person who uses services

Continuous Operations Services: Continuous operations are activities within a business that are ongoing and sustained in the event of a business disruption. Continuous operations also describe companies that operate 24/7

Configuration Item: any component that needs to be managed in order to deliver an IT service. ISO/IEC 20000:2018 says a CI is any element that needs to be controlled in order to deliver a service.



Event: An event is any change of configuration item (CI) from one state to another within an IT service

Incident: Is an unplanned interruption to a service or reduction in the quality of a service.

Request: formal request from a user for something to be provided – for example, a request for information or advice; to reset a password; or to install a workstation for a new user.

Problem: a problem is the cause, or potential cause, of one or more incidents. Problems can be raised in

response to a single significant incident or multiple similar incidents.

Change: is defined as the addition, modification, or removal of anything that could have a direct or indirect effect on services.

Output: An output is a tangible or intangible deliverable of an activity.

Outcome: An outcome is a result for a stakeholder enabled by one or more outputs.

Methods

Main body of this work is derived from ITIL® v4 best practices.

To find competition some research needs to be done. Here I have used IDTechEx as a resource to find basic information and competitors in logistics and disinfection robotic industries. Some companies had already been bought by other companies and some had changed their name since summer 2022. Once I had found advertised companies, I browsed through their web pages and sent emails to their representatives with research questions. Competitor scope results and analysis is not the main concern here and thus is appended as additional material.

<https://www.idtechex.com/en/research-report/service-robots-2022-2032-technologies-players-and-markets/864>

Vision

Here I will describe the basic infrastructure of a fully developed IT service, categorized by practices. This is because RaaS-service is very much comparable, e.g. laptop/car leasing schemes. RaaS also needs a stable IT infrastructure for the platform to be successful.

A plan to achieve this level of service is going to be presented in the next report. What is most noteworthy about this is that this is best practice, which means that it is not the only way of doing things, but it has been deemed most successful when tested over time for any type of organization.

Example of a best practice: Fire is hot. If your business is to play with fire using your hands, the best practice here is to use Fireproof gloves. You can still use other types of solutions to achieve the same goal, e.g. any other gloves or even wishful thinking, but these inferior solutions are not the most cost effective nor risk averse in the long run and thus won't help you to preserve your company operations for decades to come.

After all, it's cheaper to get a pair of purpose built gloves for 100€ than to spend thousands of euros on the sick leave of a worker with a severe burn and pay for her/his replacement, just because you thought that purchasing 10€ gloves will save you 90€...if you can even get a replacement, if you can't then your business is losing money and not gaining any income.

That said, having the following collection of management practices, implemented and actively practiced in a company, is comparable to having a maxed-out character in a Massive Multiplayer Online -games, where typically the

Report 2 - RaaS Vision of MVP infrastructure and organization

Maksim Korobkin

2



game just starts once you have a maximum level character and because you have invested so much time to get here, you also know how to use your character. However, this does not mean that you cannot be successful and have fun playing endgame content with a "lower level" character.

Service

ITIL® v4 states "Service is a means of enabling value co-creation by facilitating outcomes that customers want to achieve, without the customer having to manage specific costs and risks." Let us begin by dissecting this sentence.

For a RaaS platform "facilitating outcomes" means the use of a purpose-built robot to substitute a business-related manual task, this should always produce a justifiable value to the customer. Because in IT, bad service can be more expensive to the customer than no service at all.

Value co-creation means that the customer has a dedicated person or even a team of people who are working with service provider who has dedicated personnel to maintain and develop the product further.

A justifiable value means that a robot is 100% effective at what it does, but it does not need to be efficient at all in the beginning of the project, because application specific efficiency can only be achieved during further development of the product while it is in use.

In leasing schemes, the customer does not need to care about the costs related to fabricating, deploying, maintaining, and upgrading the robot, but is paying for all of it anyway in a recurring subscription fee. This puts most of the risk management involved with providing the service on the service provider who should have at least a minimal redundancy implemented in the service, to mitigate risks of major disruptions to the service which can lead to monetary and reputation penalties according to lease agreements.

All the above gives us an idea of what is required from the Service provider organization.

So on top of the existing company structure there would be additional structures.

The following is a listing of management practices that ITIL® v4 provides some framework of best practices for. From these practices the infrastructure can be designed.

The ITIL® v4 general management practices

Include:

- Strategy management
- Portfolio management
- Architecture management
- Service financial management
- Workforce and talent management
- Continual improvement
- Measurement and reporting
- Risk management
- Information security management
- Knowledge management
- Organizational change management
- Project management
- Relationship management
- Supplier management

The service management practices in ITIL® v4

Include:

- Business analysis
- Service catalogue management

- Service design
- Service level management
- Availability management
- Capacity and performance management
- Service continuity management
- Monitoring and event management
- Service desk
- Incident management
- Service request management
- Problem management
- Release management
- Change enablement
- Service validation and testing
- Service configuration management
- IT asset management

The ITIL® v4 technical management practices

Include:

- Deployment management
- Infrastructure and platform management
- Software development and management

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Conclusion

Currently in Done Robotics I have identified following ITIL® v4 comparable practices implemented in varying degree of readiness:

- Business analysis
- Continual improvement
- Workforce and talent management
- Project management
- IT asset management
- Risk management
- Knowledge management
- Software development and management
- Measurement and reporting
- Architecture management
- Relationship management
- Supplier management
- Organizational change management
- Information security management
- Knowledge management

This collection of practices is tailored mainly for R&D activities and for those intents and purposes, it works. In the next report I will be exploring the next steps that need to be gradually taken in order to get from pure R&D to a service and all the way to the endgame scenario regardless of whether Drone Robotics wants to go global or stay local in the future.

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Appendix

Proposed Vision statement:

At Done Robotics we help you to help humanity.

The idea behind this statement is to capture the interest of a certain audience, namely those who like to help humanity and have enough resources and boldness to implement these monumental improvements, obviously with our help. Improvements like ubiquitous use of soap to wash hands was to hygiene, buttons, shoelaces, belts, ~~shoes~~ or a wheel once were.



Competitor scape

Email results

The email campaign lasted one week and only four useful replies were received from 19 companies contacted. This meant that I had to compare companies based on their publicly available materials.

Upon inspection the nineteen companies that were analyzed divided into different categories, revealing that IDTechEx free webinar slides needed more manual refining to be useful.

Companies landed in following six categories:

1. Multiple solutions (Most advanced company)
 - a. Cyberdyne:
 - i. Exoskeletons and cybernetics
 - ii. Rehabilitation tools
 - iii. Cleaning bot
 - iv. Indoor logistics
 - v. Photoacoustics
2. R&D services for robotization or development platform modules
 - a. Samtec
 - b. Yujin Robot
 - c. IDMind
 - d. Blue ocean robotics
3. Data gathering (most high-tech solution)
 - a. Bots and Us
4. Box on wheels
 - a. Starship
 - b. Ricerobotics
 - c. Relay robotics
 - d. Aethon
5. Cleaners in several categories
 - a. Vacuum: Friendly robots b2b and iRobot b2c
 - b. Floor wash: Adlatus
 - c. UV-disinfection: Blue Ocean robotics and IDMind
6. Flying delivery (Box on a quadcopter)
 - a. Flytrex
 - b. SkyDrop
 - c. Wingcopter
 - d. Matternet
 - e. Wing

Cyberdyne has the most versatile selection of solutions and is probably the most experienced of them all as they started already in 2004 with exoskeleton products and later expanded to lower tech markets.



Business models

The main two business models available on the market for RaaS are to sell a robot or lease a robot.

But there is always a "repair/replace"-scheme in place for each leased/sold robot.

Some of the companies like Cyberdyne and iRobot are old players and have mainly a b2c business model, but just like b2b it includes a servicing/replacement scheme for some dysfunctional robots.

In b2c model customers buy the robot and if it breaks before the EU mandated warranty (2 years) runs out, or is voided based on user agreement, the factory has to fix or replace it. With the b2b model it is customary to have an SLA-agreement instead, where it is defined what is to be done to the broken robots and how fast, when they have suffered an incident type of event during the operations regardless of who/what broke it.

Coarse analysis of Competitor scape

Technologically, solutions were not very high tech, robots themselves being the most complicated parts. This holds especially true for Cyberdyne who also makes prosthetic robots. Box on wheels/quadcopter solutions were the most dominant on the market, while cleaning robots is most complicated and probably the oldest application that has recently gotten some autonomy updates. The cleaning robots' market is less saturated with competitors, the biggest of them iRobot concentrating mainly on the b2c market. Four companies seem to exist solely to provide support services for other RaaS-companies and will even help design the robots.

The most high tech solution that was visible was data gathering by Bots and Us as the payload is a machine learning algorithm unlike UV disinfection solutions, with only 2 active player companies who have come up with a solution of attaching a lamp onto wheels instead of a storage space.

APPENDIX 3.

Case Done Robotics Ltd: Lifecycle of RaaS-platform from point of view of infrastructural/organizational changes

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Introduction

Main theme in ITIL® is cost effective infrastructure and cost-effective transitions. That said, in this report we are going to be concentrating on constructing a cost effective minimum viable organization, while outlining parts of Core service offering of RaaS-platform. Here each department and practice have a justifiable reason for its manifestation into existence at a time and a role in helping to realize more cost-effective organizational transition.

ITIL® example

Problem management is a practice that stabilizes production and is needed to analyze all ongoing operations. But problem management practice is not always applicable, for example issues arising due to changes. When a change has happened, new processes or changes in existing processes have come in force, before it can be used by an existing agent, old processes need to be unlearned first. This learning process, which can also be described as adoption time, takes time, and produces lots of problematic-looking activities, when it is just in a process of change.

Some types of changes may take years when being implemented in a big enough company. But Problem management practice will always find uses in the dynamic environment that is a human run organization. Change management process needs stabilizing too if you want predictable outcomes.

As another example, this above-mentioned adaptation time strongly correlates with time of onboarding new employees, but it can be reduced with help of a dedicated resource in Knowledge management practice. This is a support role that needs to be practiced continuously. Because the longer an entity exists the more knowledge it acquires over time. Time also changes the operational environment and in order to avoid incidents and their escalations caused by outdated knowledge, for example calling an ex-employee to ask about a Critical incident because of outdated contact information, which was found in the production solution database, is still a breach of information security. But it is a manageable breach, if only we know about it.

Knowledge management practice needs to be periodically implemented to different parts of ever evolving company documentation.

Definitions:

b2b: business to business

b2c: business to client

IT: information technology

ITIL®: Information technology infrastructure library

DevOps: Development Operations

Report 3 - Lifecycle of RaaS-platform from point of view of infrastructure/organizational changes

Maksim Korobkin



Agent: a person who is responsible, accountable, consulted or informed about activities defined by their practice.

User: A person who uses services

ITIL® concepts

Service: a means of enabling value co-creation by facilitating outcomes that customers want to achieve, without the customer having to manage specific costs and risks.

Product: a product is any configuration of an organization's resources designed to offer value for a consumer. Resources can include people, capital, equipment, software, etc.

Service provider: an organization that takes up the role of creating and delivering services.

Service offering: a description of one or more services that are designed to address the needs of a target consumer group.

SLA: Service Level Agreement, "a documented agreement between a service provider and a customer that identifies both services required and the expected level of service." Simply put, an SLA defines what the IT service provider and the customer should expect when contracting for a service.

Customer: A person who defines the requirements for a service and takes responsibility for the outcomes of service consumption, e.g., the IT Manager.

Continuous Operations Services: Continuous operations are activities within a business that are ongoing and sustained in the event of a business disruption. Continuous operations also describe companies that operate 24/7.

Configuration Item: any component that needs to be managed in order to deliver an IT service. ISO/IEC 20000:2018 says a CI is any element that needs to be controlled in order to deliver a service.

Event: An event is any change of configuration item (CI) from one state to another within an IT service.

Incident: an unplanned interruption to a service or reduction in the quality of a service.

Request: formal request from a user for something to be provided – for example, a request for information or advice; to reset a password; or to install a workstation for a new user.

Problem: a problem is the cause, or potential cause, of one or more incidents. Problems can be raised in response to a single significant incident or multiple similar incidents.

Change: is defined as the addition, modification, or removal of anything that could have a direct or indirect effect on services.

Methods

I shall begin from our starting point that was established in the previous report, then I shall build the first draft of a roadmap to be implemented during consequent ITIL® lifecycles.

Start and end points of this scope are conforming with ITIL® process map shown below and were chosen to be following:

Cycle starting point: Known current state of the company.

Cycle end point: The beginning of an upgrade cycle, this can be timed to happen once a month or even every few years depending on progression of related technologies and speed of their adoption.

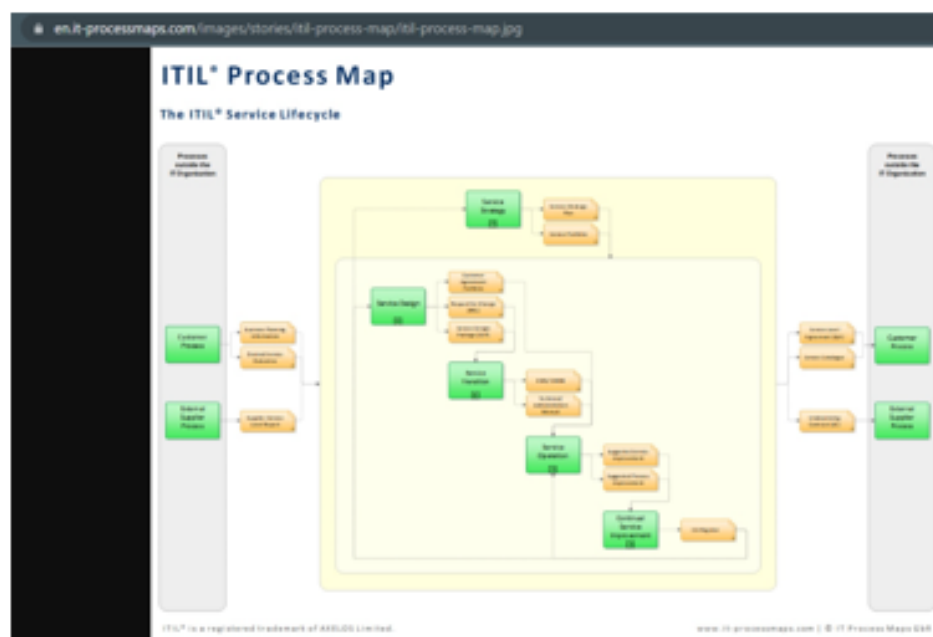


Making this roadmap a custom solution for companies which have this particular set of practices already established. On the other hand, for new startups this can be the starting point, the vision of first steps that need to be taken to get started.

Roadmap

Mapping of the current state is always a starting point of any improvement activity in ITIL® and is a perfect time to consider what is to be done to the future of the product/service that may be operated continuously. This point acts like a milestone in project management, but because we are dealing with a process, broader analysis needs to be performed. Preferably together with each of the customers and their users, who may have identified new value propositions, also known as issues worth automating/robotizing.

ITIL® is big and has lots of details. There are two distinct ways for organizations to adopt ITIL®, both requiring use of ITIL® certified practitioners. The first approach is to slowly develop existing processes to be increasingly ITIL® compatible during daily operations, which is a less disruptive practice but takes years to achieve full transition.



Or just implement ITIL® throughout organization using premade tools like ITIL® Process Map in which case transition takes only a few months. A full version of the ITIL® Process Map can be purchased to streamline adaptation of the ITIL® process. The logic for purchasing this map is that we do not need to reinvent the wheel when we can just buy



one and start learning how to use it. Click on the image above to see the introduction video of using the ITIL® Process Map with the link shown under the image.

Currently in Done Robotics I have identified some ITIL® v4 comparable practices implemented. These are implemented in varying degrees of completeness and sometimes multiple practices assigned to one person. Having following practices implemented to full extent and assigned to a responsible person is a prerequisite and a starting point of this roadmap:

- Business analysis
- Continual improvement
- Workforce and talent management
- Project management
- IT asset management
- Risk management
- Knowledge management
- Software development and management
- Measurement and reporting
- Architecture management
- Relationship management
- Supplier management
- Organizational change management
- Information security management
- Knowledge management

The next step is that we need to establish a few more practices over time and some of them simultaneously. This is not the full complement to ITIL® practices but is considered enough for first product release. Following practices need to be established, in order later defined in a The Map:

- **Service level management** is done with customers to collect feedback and use that information to maintain and improve the service.
- **Availability management:** applied on the Configuration Items can be fully automated, monitored, and adjustable.
- **Capacity and performance management,** includes the service designs, plans, and processes that ensure the IT organization has the right number of resources at the right time and at the right price to keep operations running smoothly.
- **Service continuity management:** weekly follow-up meetings about workarounds for incidents, solutions to problems and approvals to implement billable and non-billable changes to the infrastructure.
- **Monitoring and event management:** for operation critical configuration items in hardware and software categories
- **Service desk:** single point of contact for customers to place a request or to document, communicate and resolve an incident or a problem.
- **Incident management:** dealing with interruptions and reductions in quality of the service, applying solutions and coming up with workarounds to restore optimal operations as soon as possible.
- **Service request management:** providing a selection of agreed upon services e.g. a password reset in identity management or order of additional robotic units for use in new facilities.
- **Problem management:** for stabilizing and streamlining production processes while maintaining quality of deliverables.
- **Release management,** where final assembly, quality control and release of the robots to be used by end users happens.



- **Change enablement**, a DevOps team of people who can analyze the product on a technical level and work with people from different technical and organizational practices to manage implications of the changes and prevent incidents caused by change.
- **Service validation and testing** can be a collaboration with a university to scope and recruit new talent using standardized methods of testing.
- **Service configuration management** is done by a service owner who approves documentations and initiates modifications to the content of service agreement and Service Level Agreement.

And from technical management perspective

- **Deployment management**: to help release management with the logistical and educational part of the product release. This practice makes sure that the end user receives a fully functional product and knows how to use it correctly. They should be able to produce initial documentation and introduction to the service desk as a starting point for their solution base.
- **Infrastructure and platform management**: the purpose of the practice is to oversee the infrastructure and platforms used by an organization. When carried out properly, this practice enables the monitoring of technology solutions available to the organization, including the technology of external service providers.

The Map

Following Gantt chart² helps to visualize priorities and identify 3 distinct cycles. Timeline has been redacted because it is not relevant for this step of the design process, here we evaluate and identify priorities of each practice based on the need to have a cost effective, fully functional, and fully adjustable RaaS-platform. These cycles are marking the timing of the adoption of new practices.

Infrastructure and...	Goal: How the practice contributes to the goal, contribution of practice to user, time, budget, risk, etc.
Capacity and perf...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Release management	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Deployment mana...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Monitoring and m...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Structural mana...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Service configura...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Change managem...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Service valida...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Availability manag...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Service desk	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Service automati...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Incident managem...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Service request ma...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Problem managem...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.
Cost managem...	The practice is business critical, therefore, the practice is critical for all activities when capacity level of infrastructure technologies are enough to deliver with service.

During the first cycle, some serious planning is to be done. All identified and necessary organizational alignments should also be implemented during this development cycle.

During the second cycle, it is a good practice to have a prototype in a presentable shape and form, such that existing customer acquisition practices can attract new and assure existing customers for whom the resulting RaaS-platform will be customized for, during a pilot. Products resulting from each prototyping session should be, look and feel, namely: robust, reliable, ready for use and easy to fix.



During the third cycle it is time to implement the rest of the infrastructure that was agreed upon and designed together with the customer in the second cycle. For example, if the service desk was not included in the initial service offering, then this practice is not needed.

Things to keep in mind here are that training new people takes time and monetary investment, retraining existing personnel may take longer. Depending on the intelligence, personality type and other qualities of the employee, several weeks to several months of wages need to be paid, while the employee is learning his/her job. If that person has been doing this kind of job before there is also unlearning time in this calculation. There is also a separate set of distributions of learning curves, depending on the complexity and quantity of new tasks assigned to each individual.

What next?

Now that the future need has been established, the first thing before going any further is to align each existing practice with corresponding ITIL® structure, as they will be needed to support the rest of the infrastructure. This can be done as a part of establishing the capacity and performance practice.

Then document functions in their respective departments with specific skill sets, which are acquired by building a solution database, preferably by ITIL® certified managers. This solution database will later be the immaterial property of Done Robotics Ltd. Baseline database contains but is not limited to: scope of responsibility, description, timed tasks, tools, tips and tricks all of which are documented in the solution database for each practice that has been implemented using at least the processes described in the ITIL® Process Map.

It is an ITIL® best practice, to have each practice managed by an ITIL®-certified manager who can move laterally between projects wherever needed, all management activities are guided by a respective product owner.

Building a solution database

Building a solution database happens by managers, engineers and technicians documenting daily tasks and solutions to recurring tasks or challenges. It consists of actions that were performed to achieve a desired result and alternative courses of action when that result is unachievable in a reasonable time frame. Initially it may be a good idea to rotate existing managers between practices to perform quality control of the documentation. Rotation should be done at 1 - 2-year intervals, such that each manager gets efficient enough with new responsibilities to be able to provide their own solutions. Use of different personalities² will help develop a more holistic Solution database for each practice.

This automates the generation of internal practices and brings the organization together by making people help one another to transfer the internal best practices that were learned along the way, even when not necessarily that well documented.

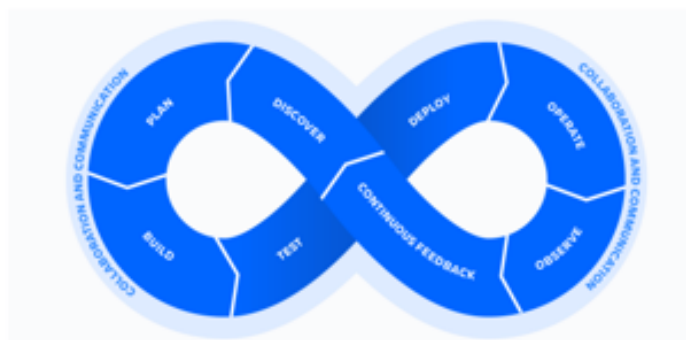
In this matter it is better to move slow enough to be smooth, because smooth motion is really fast if you want to achieve multiple manual and repetitive tasks in a dynamic environment and in a timely fashion. Another good consideration is that in a well-designed dynamic environment, mistakes are designed to be forgiving, to make sure that they will be documented and learned from.



Using a Fail Fast - technique is very advantageous here, it ensures that we have understanding of the product, we know it works and also what to do when it does not work. Here, it is no longer a "If mistakes happen, then we decide what to do." mentality, but rather it is a "When mistakes happen, then we do this..." mentality.

An ITSM system or comparable custom setup integrated with asana, can be used for internal - and external communications. A platform like Service Now³ can be used, which comes with some built-in ITIL® compatible all-in-one frontend and backend solutions in place. Essentially, Service Now can be a shop and a service management interface, fully customizable to fit the needs of each specific practice, application and process using built-in automation functions or even Robotic Process Automation - tools like UIPath⁴.

Complementary routes



Every solution on this planet is flawed in some way and ITIL® is no exception here. ITIL® is bureaucratic, bulky and requires a sizable investment to maintain.

For smaller organizations developing their first product, a DevOps approach is leaner and might make the workload more efficient by giving a simplified framework to design and implement stable production process activities at the end of each production cycle. Also in this way, employees know exactly what will happen after this work is done.

DevOps⁵ "Is the practice of bridging the gap between development and operations. Its core principles are open communication, collaboration, and shared goals."

Fascinatingly "DevOps is more than just development and operations teams working together. It's more than tools and practice. DevOps is a mindset, a cultural shift, where teams adopt new ways of working,"⁶ which means it's applicable also within ITIL® practices. For example the mind map of a twisted circle above can be used to improve internal production processes, as well as developing and later improving individual practices. A very versatile mindset.

Atlassian proposes a doctrine of using DevOps within ITIL® practices. And in a way, DevOps can be seen as one of the practices in ITIL®, where ITIL® provides the rest of the organizational framework with traditional management activities that are designed using a DevOps process.

Sources

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