

Czech University of Life Sciences Prague

Faculty of Economics and Management

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Master's Thesis

**Optimizing Organizational IT Service Management Through
the Implementation of ITIL Framework**

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Optimizing Organizational IT Service Management through the Implementation of ITIL Framework

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The primary objective of this thesis is to analyze the current organizations' IT service management and pinpoint any areas that could gain more possible benefits from the deployment of new standard ITIL practices.

Methodology

In the practical part, We will first identify an organization's IT service management fields that need to be integrated with ITIL Principles. Then, We will use multi-criteria decision analysis to determine the effective quality and cost. Then, we will implement shell scripting operations to automate a business process and service. Finally, We will create an Interaction model using the UML use-case scenario to show proper Team-End user relationship.

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ARCURI, Maria Cristina (ed.), 2018. Asset Management: Strategies, Opportunities and Challenges. ISBN 978-1-5361-4246-4.

BLOKDYK, Gerardus, 2018. ISO 20000 a Complete Guide – 2019 Edition. ISBN 978-0-6555-1889-1.

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KNAPP, Donna, 2003. A Guide to Help Desk Concepts: Service Desk and the IT Infrastructure Library. ISBN 978-0-619-15946-7.

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Declaration

I declare that I have worked on my master's thesis titled "**Optimizing Organizational IT Service Management through the Implementation of ITIL Framework**" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 30.11.2023

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Optimizing Organizational IT Service Management Through the Implementation of ITIL Framework

Abstract

The Purpose of this thesis is to point out the key elements of an organization that can be improved by applying the best standards from recognized guidelines. Nowadays most companies are IT-oriented. Whether it is finance, Sales, or HR management every department is integrated with IT devices and management. Companies face huge losses and less customer reliance and satisfaction when any IT incidents cause disruptions to any departments or clients' normal work. There may be several problems also solutions may be several for those. However, organizations have to select the best and most effective solutions among them. That's why there have been conducted real-world case studies based on organizational study and research. The objective is to apply ITIL (Information Technology Infrastructure Library) Framework practices based on those case studies criteria to draw out better outcomes and also keep aligned with IT Service Management (ISO20001) standards. This thesis will be a suitable guideline for small or medium new start-up companies.

Keywords: Value, Service, Cost, Process, Policy, Category, Relationship

Optimalizace správy IT služeb organizace prostřednictvím implementace rámce ITIL

Abstrakt

Cílem této práce je poukázat na klíčové prvky organizace, které lze zlepšit aplikací nejlepších standardů z uznávaných směrnic. V dnešní době se většina společností orientuje na IT. Ať už jde o finance, prodej nebo řízení lidských zdrojů, každé oddělení je integrováno s IT zařízeními a správou. Společnosti čelí obrovským ztrátám a menší důvěře a spokojenosti zákazníků, když jakékoli IT incidenty způsobí přerušení běžné práce jakéhokoli oddělení nebo klientů. Problémů může být několik a pro ně může být několik řešení. Organizace však mezi nimi musí vybrat ta nejlepší a nejúčinnější řešení. To je důvod, proč byly provedeny případové studie v reálném světě založené na organizačních studiích a výzkumu. Cílem je aplikovat postupy rámce ITIL (Information Technology Infrastructure Library) založené na kritériích případových studií za účelem dosažení lepších výsledků a také udržení souladu se standardy IT Service Management (ISO20001). Tato práce bude vhodným vodítkem pro malé a střední začínající firmy.

Klíčová slova: Hodnota, služba, cena, proces, politika, kategorie, vztah

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1. Introduction

The reputation of an organization is dynamic and subject to change depending on its activities, reactions to outside events, and continuous stakeholder interactions. Managing and maintaining a positive reputation requires a strategic, long-term commitment, sustained dedication to ethical business practices and stakeholder involvement. One of the key factors which most of the organizations rely on Quality of Products or Services and Customer Satisfaction.

Organizations primarily generate value for their clients and themselves through services. Since almost all services are now IT-enabled, businesses stand to gain a great deal by developing, growing, and enhancing their IT service management capabilities.

Technology is advancing faster today than ever before. Technological advancements like block chain, machine learning, cloud computing, infrastructure as a service (IaaS), and machine learning have created new avenues for value creation and made IT a vital source of competitive advantage and business driving force. Thus, **IT service management** is positioned as a crucial strategic capability.

Many firms are taking advantage of these opportunities by starting large-scale transformative programs to make sure they stay successful and relevant.

Businesses without a solid IT service infrastructure may face a number of difficulties that lower their general productivity, efficiency, and competitiveness. That's why it is necessary to implement a comprehensive set of practices for IT service management which can address these challenges by providing a structured and proven framework For Example **ITIL (Information Technology Infrastructure Library),the most widely adopted guidance on IT service management (ITSM) in the world according to google survey.** It helps organizations align their IT services with business needs, improve efficiency, and develop overall service quality.

2. Objectives and Methodology

2.1 Objectives

The primary objective of this thesis is to analyze the current organizations' IT service management and pinpoint any areas that could gain more possible benefits from the deployment of new standard ITIL practices.

2.2 Methodology

In the practical part, we will first identify an organization's IT service management fields that need to be integrated with ITIL Principles. Then, we will use multi-criteria decision analysis to determine the effective quality and cost. Then, we will implement shell scripting operations to automate a business process and service. Finally, we will create an Interaction model using the UML use-case scenario to show proper Team-End user relationship

3. Literature Review

3.1. The Theoretical Background of ITIL

ITIL was started in the 1980s when data centres became decentralized and operated in a variety of architectures. This led to decreased reliability of IT services. Recognizing the importance of viewing IT as a service, in 1989 the UK's Central Computer and Telecommunications Authority (CCTA) developed a well-defined and detailed methodology, called ITILv1. In 2000 CCTA was incorporated into the Government Department of Commerce, which in 2001 released ITILv2. ITIL v3 was released in his 2007 and updated in 2011. In 2013, the UK Cabinet Office and Capita PLC established an organization called **Axelos**. The purpose of this organization is to;

“Make individuals and organizations more effective by providing practical guidance, content, and qualifications distilled from real-world experience and developing practices.”
(A Brief Overview On Origin And Evolution Of ITIL, 2023)

3.2. Evolution of ITIL

Everything that exists in a dynamic environment must evolve. For example, the clothing market is constantly changing. How can a clothing retailer succeed without adapting to new trends and designs in the market? Just like the clothing market, the IT market is also constantly changing. So how can ITIL maintain its precision?

This is why ITIL has a long history of development. Further background information about ITIL can be found here:

Origin: I would like to start the discussion the origin of ITIL according to the **Axelos** (Axelos, 2020) .

First Edition: The first version of ITIL, known as ITIL v1, was published in the late 1980s as a series of books that documented best practices in various aspects of IT service delivery. The main goal was to standardize IT service management for the organization.

ITIL v2: In the early 2000s, ITIL received a **major** update with the release of ITIL v2, introducing a **service-oriented** lifecycle approach with processes organized by discipline.

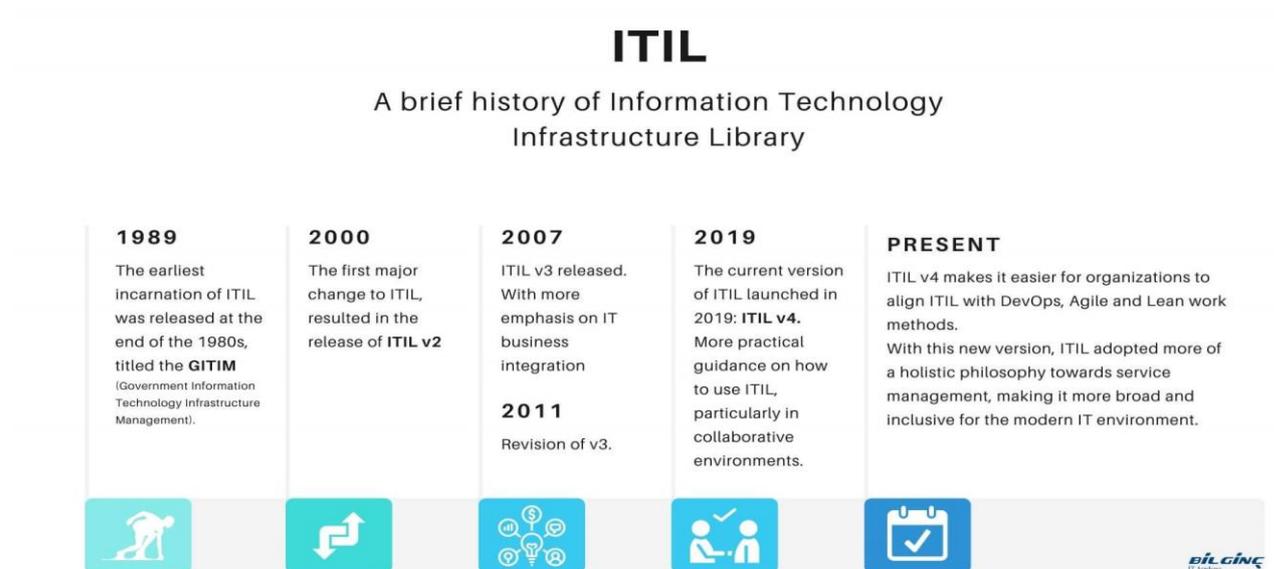
ITIL v3: Released in 2007, ITIL v3 introduces a **service lifecycle model** that consists of **five phases**: service strategy, service design, service transition, service operations, and continuous service improvement.

ITIL 2011: This version **improves** ITIL v3 and **includes** clarifications and additional guidance, but retains the core concepts.

ITIL 4: Introduction: Introduced in 2019, ITIL 4 represents a significant update to the framework, aligning ITIL with modern **IT practices and methodologies** such as Agile, DevOps, and Design Thinking.

SVS (Service Value System): ITIL 4 introduced the Service Value System, which emphasizes a holistic approach to **service delivery** and emphasizes the interconnections of various **components** within an organization.

Four-dimensional model: This model considers **four dimensions** to provide a comprehensive view of service management: organization and people, information and technology, partners and suppliers, and value streams and processes.



Picture 1: ITIL Evolution (Source: <https://bilginc.com/en/blog/what-is-itil-5569/>)

3.3 ITIL4 Service Management

ITIL4 is a set of practices, policies, and processes aimed at aligning ITSM (IT Service Management) with business needs and improving the overall delivery and management of IT services.

The primary goal of **ITIL** is to ensure that IT services are delivered efficiently, effectively, and in a way that adds **value** to the business.

3.3.1 Value-Co Creation

Value is the perceived benefits, usefulness, and importance of something. According to Axelos “ **Value co-creation is a concept that emphasizes collaboration between service providers and consumers to jointly create value.**” (Axelos, 2020) This concept goes beyond traditional ways of thinking about value creation, which often assumed a unidirectional flow from producers to consumers. In a value co-creation framework, both parties actively participate in the creation and delivery of value. This idea is especially true in service-oriented industries where customers are often an integral part of the service creation process.

There was a time when organizations that called themselves "**service providers**" thought of their job as providing **value** to customers, much like a courier company delivering a package to a building. This view treated the relationship between the service provider and the service consumer as mono-directional and distant. The provider provides a service and the consumer receives added value. Consumers play no role in the creation of their own value. It does not take into account the extremely complex and interdependent service relationships that actually exist. Organizations are increasingly recognizing that value is **co-created** through active collaboration between providers and consumers and other organizations that are part of related service relationships. Vendors should not work in isolation to define what is of value to customers and users, but should instead build mutually beneficial and interactive relationships with consumers, where they participate in the **service value chain**.

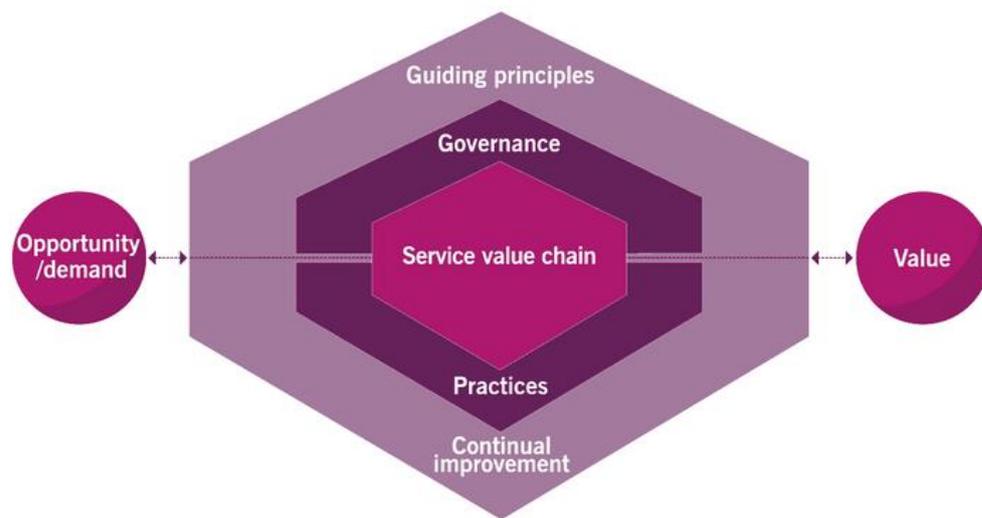
3.3.2 The ITIL SVS

ITIL SVS describes how an organization's various components and activities work together to drive value creation through IT-enabled services. These can be flexibly combined and require integration and coordination to maintain organizational consistency. ITIL SVS facilitates this integration and alignment, providing organizations with powerful, integrated, value-driven alignment.

The core components of ITIL SVS are:

- ITIL Service Value Chain
- ITIL Practice
- ITIL Guiding Principles
- Governance
- Continuous Improvement.

The ITIL service value chain provides an operating model for the creation, delivery, and continuous improvement of services. It is a flexible model that defines six key activities that can be combined in different ways to form multiple value streams. The service value chain has the flexibility to adapt to multiple approaches such as DevOps and centralized IT to meet the needs of multimodal service management. Value chain adaptability allows companies to respond to the changing needs of stakeholders in the most effective and efficient manner. ITIL practices make service value chains more flexible. Each ITIL practice supports 4,444 different service value chain activities, providing **ITSM** practitioners with a comprehensive and versatile toolset. ITIL SVS also includes governance activities that enable organizations to continually align their operations with the strategic direction set by governing bodies. All components of ITIL SVS are supported by continuous improvement. ITIL provides organizations with a simple, practical improvement model to remain resilient and agile in an ever-changing environment. ((Axelos, 2020) .



Picture 2: Service Value Chain (Source: <https://www.alvao.com/en/blog/itil-4-service-value-system-opportunity-value>)

3.3.3 ITIL 4 Dimensions Model

To ensure a holistic approach to service management, ITIL 4 outlines four dimensions of service management,

from which each component of the SVS should be considered. The four dimensions are:

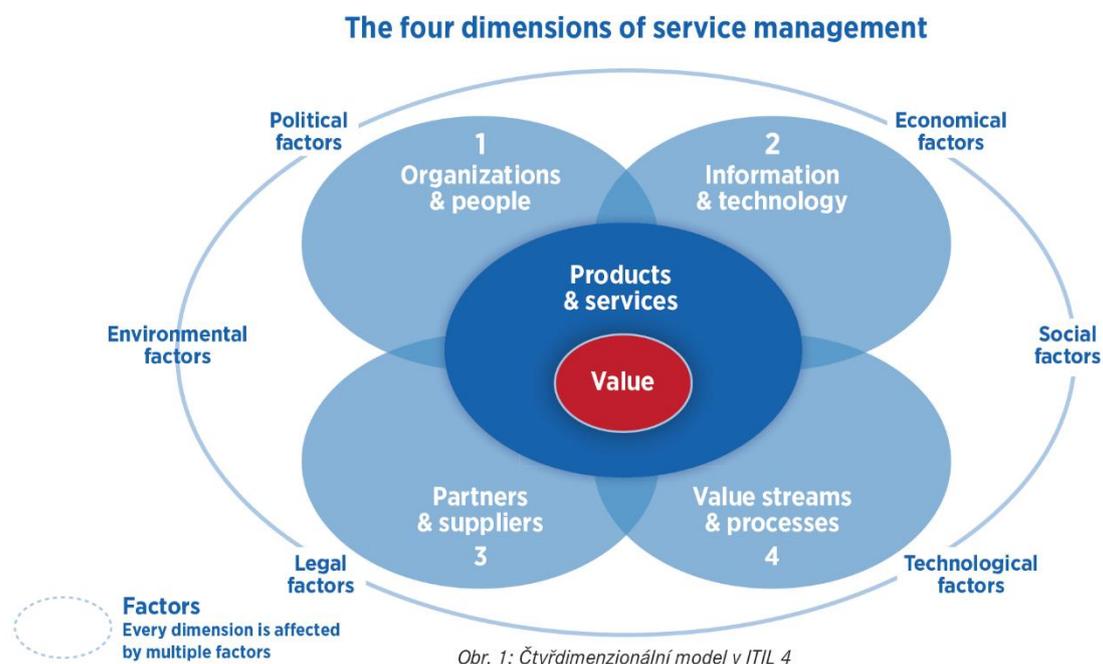
- organizations and people
- information and technology
- partners and suppliers
- value streams and processes. (Axelos, 2020)

Organizations and People: This dimension focuses on the **human resources** and **organizational structure** involved in providing **IT services**. This includes considerations such as the roles and responsibilities of IT staff, the skills and knowledge required for different roles, and company culture and structure.

Information and Technology: This dimension focuses on the **technologies** used to provide IT services. This includes considerations such as the hardware and software infrastructure, the data and information managed, and the tools and technology used to support IT processes.

Partners & Services: This dimension focuses on the relationships an organization has with **external stakeholders** such as partners, suppliers, and customers. This includes selecting and managing suppliers, negotiating contracts, and working with partners to provide IT services.

Value Streams and Processes: This dimension focuses on **activities and workflows** related to creating, delivering, and supporting IT services. This includes considerations such as process design and implementation, performance management, and continuous improvement of IT services.



Picture 3: ITIL 4 Dimensions (Source: <https://dsm.tate.cz/cs/2021/dsm-2-2021/itil-4-zakladni-fakta-dokonceni>)

3.4 Organizational Structure

An organization's equipment elements are the basic building blocks that define its structure, processes, and general functionality. These elements form the basis on which an organization operates and achieves its goals.

The main configuration elements are:

Work Specialization: This involves breaking down complex tasks into smaller, more manageable steps. This specialization allows individuals to focus on a specific area of expertise, increasing efficiency and productivity.

Departmenting: This refers to grouping related jobs into departments. Departmentalization helps organize work activities, improve communication and coordination, and facilitate professional decision-making.

Chain of Command: This creates a clear hierarchy of authority that defines who reports to whom. This ensures that decisions are made at the appropriate level and that there is a clear path for communication and accountability.

Span of Control: This determines the number of employees a manager can effectively supervise. Narrow scope management ensures close supervision and support, while broad scope management empowers employees and promotes autonomy.

Centralization and Decentralization: Centralization refers to the concentration of authority at the top of an organization, while decentralization distributes decision-making authority throughout the organization. The degree of centralization depends on the size, complexity, and strategic goals of the organization.

Formalization: This refers to the degree to which an organization's rules, procedures, and policies are standardized and documented. Formalization helps maintain consistency, efficiency, and control, but too much formalization can inhibit innovation and adaptability.

Coordination: This involves integrating and harmonizing the activities of different departments and individuals to achieve a common goal. Coordination mechanisms include communication channels, meetings, and project management tools.

Differentiation: This involves differentiating positions based on factors such as authority, responsibility, and compensation. Differentiation motivates employees, attracts talent, and aligns individual contributions with company goals. These facility elements interact to form the overall structure and effectiveness of the organization.

The choice of organizational structure depends on factors such as the organization's size, industry, strategy, and goals.

3.4.1 Organizational Asset

“Organizational assets are all the resources owned or controlled by an organization that contribute to the organization's value and ability to achieve its goals.” (ARCURI, 2018) These assets may be tangible or intangible, physical or intellectual property. According to Maria Cristina Arcuri from **Asset Management: Strategies, Opportunities and Challenges** (ARCURI, 2018) these can be classified into several types:

Tangible Assets: Physical Assets: These include real estate, equipment, inventory, and other physical resources that can be seen and touched. They directly contribute to the organization's **production, operations, or service delivery**.

Intangible assets: Intellectual property: This includes patents, copyrights, trademarks and trade secrets. It represents an organization's unique knowledge, inventions, and creative works that provide a competitive advantage.

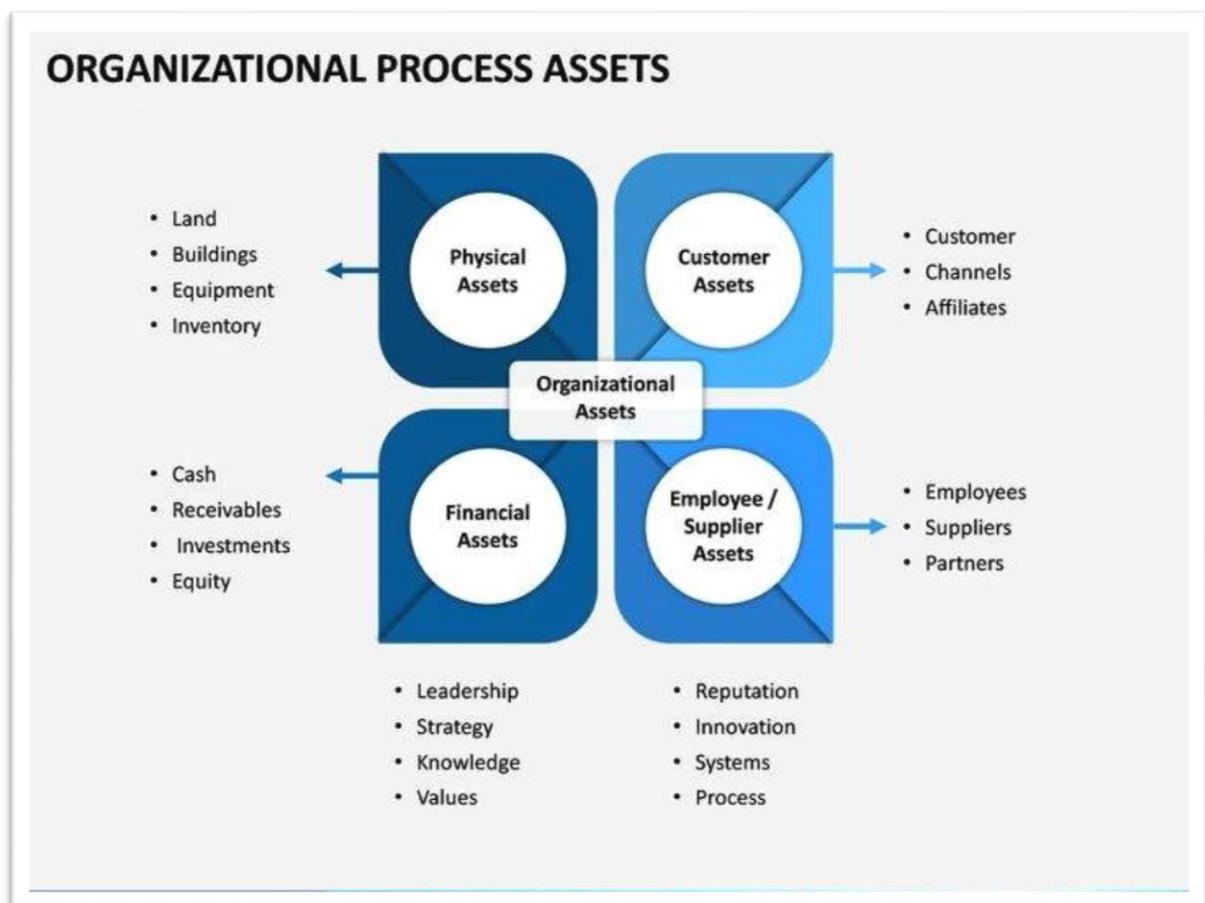
Human Capital: This refers to the skills, knowledge, and experience of an organization's employees. This is a valuable asset that contributes to innovation, productivity, and customer satisfaction.

Financial assets: These include cash, investments, accounts receivable, and other financial resources that provide liquidity and support the organization's operations.

Brand Reputation: It is the intangible perception of an organization's name, image, and reputation among its stakeholders. It impacts customer retention, market share, and the ability to attract talent and partners.

Data and Information: This includes company-proprietary data, customer information, and market information. This is a valuable asset that can be used for decision making, strategic planning, and competitive advantage.

Organizational assets are valuable resources that contribute to an organization's success and long-term sustainability. Effective management of these assets is critical to maximizing their value and achieving organizational goals.



Picture 4: Organizational Asset (Source: <https://in.pinterest.com/pin/organizational-process-assets-powerpoint-template--860891285023204038/>)

3.4.2 Integration with ITSM

The Role of **ITSM(ISO 20001)** in an Effective Service Management Strategy Information Technology Service Management (ITSM) strategies are designed to address and optimize the employee and customer service experience at the most fundamental level. It is a set of principles and guidelines aimed at providing the right combination of people, processes and technology to provide users with his/her IT support. It prescribes a set of specific best practices for aligning IT services with business needs and addressing specific ITSM-related challenges. System configurations can be complex, and customization is a major challenge for IT departments. If organizations existing systems are not flexible, it will be difficult to create a comfortable IT environment for its employees and customers to work without restrictions.

Today's enterprise IT ecosystem is complex, with a variety of cloud, on-premises, and other hybrid solutions that are often not tightly integrated.

This creates barriers to data exchange between systems, leading to delayed responses to customer issues, increased risk of errors, information/data silos, and ultimately lower customer satisfaction. As many industries focus on digital transformation, enterprises are deploying modern cloud-based systems powered by AI and automation, and service-related challenges are becoming increasingly can now remain competitive in the market. Integration with these modern applications is essential to take advantage of the latest technology and ultimately achieve efficiency.

ITSM Core Processes

An effective strategic ITSM process framework can include the following modules:

Change Management: A standardized set of steps to smoothly adopt changes to organizations IT infrastructure. Release a new service or solution or update an existing one. This is critical to managing the impact of change, ensuring business continuity, gaining visibility into the changes taking place, and maintaining a balance between the benefits and risks associated with changes occurring.

Configuration Management: This includes the process of tracking and maintaining records of the funds and assets required to provide IT services and their interrelationships.

Configuration management helps maintain up-to-date information about IT components and their relationships that affect services. This gives organizations Service desk team visibility and control over available IT resources and their distribution according to organizations requirements.

Incident Management: The process of responding to unplanned events or unexpected disruptions to maintain business continuity and restore normal operations with minimal impact. Efficient incident management is critical to quickly resolving incidents, preventing outages, and improving SLAs, which in turn leads to a better end-user experience.

IT Asset Management: (ITAM) involves the tracking and distribution of an organization's IT resources, including hardware and software, along with detailed records of upgrades and maintenance. ITAM provides a unified view of your IT resources, whether hardware or software, and helps you deploy and manage them effectively. Additionally, it is important to carefully consider the costs involved.

Knowledge Management: This is where knowledge and information within an organization is stored, documented, managed, shared, and used, and is important to avoid duplication of effort. This process is very important for organizations as it helps them maintain valuable knowledge and use it for employee training. This is critical because it allows employees to have important information upfront, reducing training costs and improving customer service.

Problem Management: Incidents are symptoms, but problems are the root causes of incidents. Problem management identifies the root cause and helps resolve it to avoid similar problems in the future. The benefits of problem management are similar to those of incident management, but much more effective.

For example, improving overall service quality, finding lasting solutions to incidents, reducing problem resolution time, and increasing employee productivity and customer satisfaction.

Service Request Management: Manage and respond to customer requests, from software installations and updates to access to actual hardware requirements. This process helps you establish a standardized order fulfillment process that allows you to track requests and

communicate with stakeholders faster and more efficiently while gathering valuable feedback. Ultimately, when these modules are implemented correctly, a robust ITSM strategy delivers strategic value and is the key to business success.

At the surface level, ITSM should provide the following benefits: A Structured Approach to IT Service Delivery Standardized Processes and Optimized Business Functions Increased Customer Satisfaction and Business Revenue Reduced Costs, Improved Operational Efficiency and Service Quality Improved Team Collaboration Real-time insights to help predict and prevent incidents Introducing new tools and automation technology. (Rath, 2021)



Picture 5: ITSM Process (Source: <https://www.ciops.com/blog/283-getting-the-itsm-basics-in-place-part-1-incident-management>)

3.4.3 ITIL 4 Management Practices

According to **Axelos ITIL4 edition** (Axelos, 2020) ITIL® 4 includes 34 management practices that help companies deliver effective services across the value chain. While previous versions of ITIL focused on IT services, ITIL 4 extends its management practices to include culture, technology, and data management. This reflects the overall shift in ITIL 4 from a process-driven mindset to a diverse and dynamic way of working.

There are three categories of ITIL 4 management practices that we will discuss in detail.

General Management Practices	Service Management Practices	Technical Management Practices
<ol style="list-style-type: none">1. Architecture management2. Continual improvement3. Information security management4. Knowledge management5. Measurement and reporting6. Organizational change management7. Portfolio management8. Project management9. Relationship management10. Risk management11. Service financial management12. Strategy management13. Supplier management14. Workforce and talent management	<ol style="list-style-type: none">1. Availability management2. Business analysis3. Capacity and performance management4. Change enablement5. Incident management6. IT asset management7. Monitoring and event management8. Problem management9. Release management10. Service catalogue management11. Service configuration management12. Service continuity management13. Service design14. Service desk15. Service level management16. Service request management	<ol style="list-style-type: none">1. Deployment management2. Infrastructure and platform management3. Software development and management

Picture 6: ITIL4 Practices (Source: <https://www.learningcert.com/it-service-management/comprehensive-guide-iti-4/>)

General management practices applied throughout the organization for the success of the company and the services it provides. **Service management** practices apply to the specific services being developed, deployed, supported, and managed. A **Technology Management** practice adopted from the technology management domain for the purpose of service management.

General Management Practices This section contains 14 management practices.

1. Architecture Management: This practice helps organizations manage the complex ways in which organizational architecture relates to different areas of the business. Provide principles, standards, and tools to help you manage change in a structured and agile way.

2. Continuous Improvement: Companies must be able to adapt their processes and services to changing business needs. Continuous improvement practices can help achieve this. This enables organizations to identify opportunities for improvement within services, service components, practices, or other parts of service management.

3. Information Security Management: This practice refers to how an organization protects sensitive information from misuse. Specifically, information security management is about how to prevent breaches of data confidentiality, integrity, and availability. In this context, confidentiality means that only authorized parties can see the information, that the information is accurate, and that the information can be accessed when needed.

4. Knowledge Management: This practice helps organizations improve how they use data. The emphasis is on convenience, effectiveness, and efficiency in the use of knowledge and data.

5. Measurement and Reporting: To make good decisions and continuously improve systems, organizations need to conduct evidence-based research. This practice provides a framework for this and recommends risk assessment and collection of relevant data.

6. Organizational Change Management: This practice helps organizations implement recommended changes as part of a continuous improvement process. This highlights the human side of change management and the lasting benefits that can be achieved when individual challenges and opportunities are considered.

7. Portfolio Management: This practice allows an organization to create the right mix of programs, products, and services to achieve its goals. The organization's financial and resource constraints are also considered.

8. Project Management: This practice helps organizations monitor ongoing projects and ensure that they are running successfully. Covers how to plan, delegate, monitor, and

manage projects. It also refers to the relationship between stakeholders and aims to maintain the motivation of those involved in the project.

9. Relationship Management: For a project to be successful, an organization must build and maintain relationships among stakeholders. This practice helps organizations identify, analyze, monitor, and continually improve relationships.

10. Risk Management: This practice helps organizations understand and address risks. There are countless ways that problems can occur, and it is important to identify them as early as possible to prevent disruption, financial impact, and sustainability issues.

11. Services Financial Management: This practice supports an organization's strategy and planning by ensuring that financial resources and investments are used efficiently.

12. Strategic Management: This practice helps organizations define specific goals and how to achieve them. It also ensures that the resources necessary to achieve these goals are allocated and that the organization's priorities are clear.

13. Supplier Management: Organizations need to effectively manage their suppliers to ensure the smooth production and delivery of products and services. This practice helps foster these relationships with a focus on creating opportunities for collaboration and identifying opportunities for improvement.

14. Employee Talent Management: This practice helps companies place talented and qualified employees in appropriate roles. Focuses on workforce planning, recruitment, induction, and training.

.Service Management Practices

As it was mentioned before, ITIL and ISO20001 standard focuses, not only on Organizations general management but they also cover all IT applications, capabilities, operations and systems within a particular organization. These processes as a whole are referred to as IT service management. They cover a whole lifecycle of a service. In ITIL, the processes are divided into five main areas,

- 1. Service strategy,**
- 2. Service design,**

- 3. Service transition,**
- 4. Service operation,**
- 5. Continual improvement**

Content of Service Management According to ISO 20001, service management consists of following processes:

- Service delivery processes
- Service level management
- Service reporting
- Service continuity and availability management
- Budgeting and accounting for IT services
- Capacity management
- Information security management
- Relationship processes
- Business relationship management
- Supplier Management
- Resolution processes
- Incident management
- Problem management
- Control processes
- Configuration management
- Change management

The resolution processes are at most importance for us, because they are closely connected to user support. (Axelos, 2020)

3.4.4 Difference Between ITIL & ITSM

The IT Infrastructure Library (ITIL) framework helps businesses manage their IT services more effectively by offering a tested collection of best practices and recommendations for ITSM.

Organizations can enhance customer satisfaction, cut expenses, and improve service delivery by adhering to the ITIL framework. Many ITIL procedures, such as incident and problem management, knowledge management, asset management, etc., would be integrated into the core functionality of the ideal IT service management implementation.

ITSM	ITIL
ITSM stands for IT Service Management.	ITIL stands for Information Technology Infrastructure Library.
The software keeps track of all business changes and arranges them to keep the business profitable.	IT related business is regulated and services are offered to customers.
Describes how organization manages the services it provides.	Among the many tools in the toolbox which organization can implement to do infrastructure management very well
The budget is used to plan for future investments and savings.	It provide service delivery on IT provision
The IT management team uses ITSM software to manage delivery services appropriately. The software for example Freshservice, Zendesk etc. also includes several other frameworks, such as six sigma, DevOps, COBIT, etc.	The framework is based on the best practices of ITSM.
In the business, ITSM always targets to gain profit by managing and implementing changes that are necessary.	In order to develop customer service, ITIL aligns IT with the business.
There are many different ways IT infrastructures can be managed.	An ITIL framework acts as a guideline to implementing ITSM.

Table 1: Differences Between ITSM & ITIL

3.4.5 IT Service Desk

IT service desks serve as hubs for communication where users can ask questions and get IT support. They are also intended to handle more general business requirements and improve the workplace IT experience for users. IT service desks serve as a communication link between other service management and the user community, which is often made up of stakeholders and employees of the company. In addition, they help with problem management, keep track of third-party connections, record modification requests, and manage software licenses.

The service desk is incorporated into several procedures, including:

- Data access

- Acquisition integration
- Supplier and partner onboarding and offboarding
- Employee onboarding and offboarding
- Business continuity
- Reporting and metrics management
- Infrastructure management
- Service monitoring
- Incident/Problem management
- Request management and more

Business structure

A service desk function can be organized in a variety of ways. The following are a few pertinent organizational structures:

- **Local Service Desk:** A service desk that serves users locally is situated close by.
- **Virtual Service Desk:** distinct organizational units can be located in different locations, but with the aid of technology, they act as one; this decreases the number of service desks by consolidating them into one central location;
- **Specialized Groups:** According to the Office for Government Commerce (2007), certain services may be so important to an organization that they require the formation of a specialized group in order to be supported. (The official introduction to the ITIL service lifecycle PDF, 2007)

Work Environment

Given that working at a service desk is often a difficult and stressful job, it is important to create a comfortable workspace. When building a service desk environment, ITIL lists several best practices, including adequate lighting, desk storage, a clear space for movement, sufficient acoustic control, pleasant surroundings, cozy furniture, and a separate area for relaxation.

21 Positions selecting the proper personnel is crucial to a service desk's success. The following are typical roles:

Services Desk Supervisor: linked to the analyst in smaller organizations; generates statistics and reports; conducts HR tasks and training;

Services Desk Manager: only justified in larger organizations; supervision of all desk activities, including the supervisors

Services Desk Analysts: first line support

Super User: A chosen business user; facilitates communication between IT and business; performs staff training for users in their area; involves in new releases

SkillSet: Ability When it comes to service desk employees' skill sets, there are two extremes:

Simple call logging at a low skill level and **technical professionals** at a high competence level.

In the latter scenario, resolution times are quicker and vice versa since inexperienced workers frequently need to elevate requests to more seasoned co-workers. Furthermore, it takes a significant financial commitment to train skilled workers. Thus, it appears that a layered strategy with novice employees at the initial level and prompt escalation to technical experts is the best way to strike a compromise between costs and performance.

Staffing: Personnel With the exception of a brief second peak at the start of the afternoon, the average workload distribution peaks at the start of the office day and then rapidly decreases. Therefore, an allocation of a workforce should agree with that. An option can be the availability of working from home or a part time staff to handle the peaks. (The official introduction to the ITIL service lifecycle PDF, 2007)

Information Service: It's important that service desk operators (analysts) have access to all the information sources they need in the workplace.

This includes:

- All incident records and information,
- Problem records and information,
- Known error data,
- Change plans,
- Internal knowledge sources (especially technical or application experts),
- Service Knowledge Management System ,
- Content Management System,
- Alerts from Monitoring Tools

(The official introduction to the ITIL service lifecycle PDF, 2007)

Performance Metrics: A common mistake is to base metrics on easily accessible information such as total number of calls.

However, it's equally important to note that these numbers can be misleading as they are influenced by many factors outside of the service desk.

First line resolution rate: Percentage of calls that are resolved on the first line.

Major Service desk measures. For better accuracy, it can be classified as follows: o Percentage of calls resolved during initial contact, Percentage of calls resolved by service desk personnel without further assistance from other groups, □ Average time to resolve an incident (if resolved first), □ Average time to escalate an incident (if resolved first), □ Average cost to resolve an incident.

- Two metrics need to be considered here: o Total service desk cost divided by number of calls, o Total cost for period divided by total call minutes, within period.
- Percentage of customer or user updates performed during the target time defined in SLA.
- The number of calls broken down by time of day and day of the week, combined with average call length metrics, is important in determining the number of staff needed. (Bělohoubek, 2011)

Customer Satisfaction Survey: While the above performance metrics provide great insight into the technical efficiency of service desk, they are completely ineffective when it comes to the most important metric: user satisfaction. A widely accepted method for measuring user satisfaction is customer satisfaction surveys. There are various ways to conduct a survey. (Bělohoubek, 2011)

Technique	Advantage	Disadvantage
After-call survey		
Outbound telephony survey	<ul style="list-style-type: none"> • High response rate 	<ul style="list-style-type: none"> • Possible feeling of pressure
Personal interviews	<ul style="list-style-type: none"> • Higher response rate • Possibility to target specific users 	<ul style="list-style-type: none"> • Changed perception due to time delay
Group interviews	<ul style="list-style-type: none"> • Sense of personal attention • Detailed answers 	<ul style="list-style-type: none"> • Time consuming • May turn into a complaint session
Postal/e-mail survey	<ul style="list-style-type: none"> • Automation • Easy to use and answer 	<ul style="list-style-type: none"> • Fear to answer in front of managers • Group thinking
Online survey	<ul style="list-style-type: none"> • Potentially large audience 	<ul style="list-style-type: none"> • Small response rate • Misinterpretations

Table 2: Customer Satisfaction survey (*The official introduction to the ITIL service lifecycle PDF, 2007*)

Accounting & SLA: First, an SLA is a formal contract between a service provider and a service customer. It must answer the following fundamental questions: Who does what, how (in what quality), at what price, when? And what happens if this agreement is breached? Please also answer whether this is the case. This document must be agreed by both parties and form the basis for the provision, management and billing of services. As a result, user support SLA must specify which requests, how many, and for how long.

Accounting: No service is free, and user support is no exception. Whether the cost of user support is included in the cost of the service or billed per usage, organizations must maintain records of who uses the service and how much. Therefore, an invoice is required for the use of services for individual customers. (Bělohoubek, 2011)

4. Practical Part

4.1 Service Management Improvement Areas

The project will demonstrate a holistic view of IT service delivery, incorporating guiding principles, governance, service value chain, practices, and continual improvement through ITIL4 and the application of ISO 20000-1 requirements, including service planning and design, service delivery, service transition, relationship management, and ongoing improvement, through this realistic endeavour. This will show the organization's dedication to providing reliable and high-quality IT services in addition to highlighting conformity with internationally recognized standards.

This practical demonstration's main goal is to show how ITIL 4 and ISO 20000-1 principles and practices may be combined and applied in a real-world IT service management situation. By aligning these two frameworks, the project aims to achieve the following goals:

Optimized Service Delivery: Showing how ITIL 4 standards and ISO 20000-1 processes may be combined seamlessly to produce high-quality IT services that are responsive to client needs and organizational goals.

Effective Problem Resolution: Showing how the integration of ISO 20000-1's incident and problem management processes with ITIL 4's problem-solving techniques can result in rapid and precise problem resolution, minimizing service interruptions.

Continuous Improvement: Demonstrating the construction of a continuous improvement cycle, motivated by ISO 20000-1's necessity for ongoing service improvement projects and ITIL 4's continual improvement techniques.

Stakeholder Engagement: Emphasizing the teamwork philosophy emphasized by both ITIL 4 and ISO 20001, promoting efficient dialogue and cooperation between stakeholders to raise service value.

In this part, we will conduct several case studies and analyze the result according to the ITIL4 & ISO 20001 Standard way. Suppose there is a growing sized startup company ABC started its journey to provide broad array of logistics services and related products. From offices in EU nations, the organization provides personal effects transportation and storage. Global mobility, immigration, departure, destination, and setting in services, fine art storage and transportation, hard copy records management and storage, third-party distribution, freight forwarding, wine storage, office fit out, and commercial relocation are among the services offered. Company needs to establish a wide range IT services to play a vital role in various aspects of business, providing essential tools, support, and capabilities that enable efficient functioning, growth, and competitive advantage. It may be challenging for the company to figure out the proper methods for a better IT service for their employees and customers.

A company's primary IT service offerings can change depending on the organization's size, industry, goals, and specific needs. However, there are several common IT service ranges that many companies typically offer to meet their technological requirements. In below we will discuss about them, we will bring out the common problems which hinders giving good IT services and we will analyze them and create proper solutions according to the ITIL 4 and ISO20001 Standards.

4.2 Case Study 1 :(Improvising IT Procurement)

Establishing proper cost allocation techniques, transparent and precise cost indicators, invoicing systems, and dealing with resistance from business units are some of the obstacles that can arise while implementing IT chargeback. When creating an IT chargeback framework, organizations must carefully take into account the culture, objectives, and unique demands of their divisions.

Almost every companies around the world are using IT services. Equipment such as (PC, Monitor, Mobile Device, Server ETC) for the business reasons.

So we need to ensure first that all the devices allocated for IT services are well maintained for the users or not?

Problems with an organization's IT service equipment can have a big impact on its operations, services, and overall business continuity. Given how dependent today's business environment is on technology and IT infrastructure, any disruptions or issues with IT service equipment could have a variety of unfavorable effects.

Any hardware or software failure can cost an employee's time management, workflows, user interactions, data loss, and productivity loss. It can effect on companies reputation as well.

Suppose **ABC Company** is planning to buy 50 usb-c windows user docking stations from their vendors for one of their branch office. Company uses hdmi/vga connectors for their external monitors, usb-c wired/wireless keyboard,mouse and RJ 45 ethernet cable or internal wifi.

The vendor offers 3 brands docking station(x,y,z).X costs 60\$ usd it is thin,portable and has windows users compability and company required connectivity options.Y costs 100\$.It is also portable and has company standards windows platform compability,connectivity(can connect 2 monitors with hdmi/vga along with usb-c devices),good build quality and durability,good performance and bandwidth power,Good user feedback and reviews,2 years warrenty.The Z one is pretty expensive.It costs 300\$. It can support any computer platform,heavy and not portable,It has longest warrenty and free cost services ,best feedback and reviews.For bandwidth performance it can transfer data 40 GB per second and strong security and firmware update features.Can support 4 monitors(hdmi/vga/dvi) and have option to support usb a/c devices.The Procurement management thinks about purchasing X brands docking stations.The docking station has multiports which can connect two external monitors,laptop charging adapter,wirelss mouse,keyboards,Ethernet lan cables for each employess and it costs 60\$ usd. The company thinks about taking X brands because it is cheaper, has device connectivity and compabilites.Also one year warrenty.

They compromised docking stations build quality and durability, performance and bandwidth, power delivery, supported resolution, scalability, More warranty and support, user feedback and reviews. Later after few days some employees are facing issues with their docking stations, After analyzing the docking stations it appears.

1. Some employees one/two external monitor is not working
2. Some doc's adapter/usb c devices are not working
3. Bandwidth performance are not good while transferring large data through Ethernet
4. Suspecting of unauthorized access as there are no features like lock slots, secure firmware, or physical security mechanisms to prevent.
5. Some IT Support finds struggle to update correct drivers and firmware as they may be unaware about this brands services and features for having not feedback, reviews and user support documentation.
6. IT technicians find some doc station faulty and those need to be repaired or replaced.

After observing the above situations, it has become a challenging situation for the organization to resolve the issue ASAP. If we analyze through **ITIL4 framework** in this case it does provide principles that can guide the decision-making process:

1. Service Strategy: One of the fundamental principles of ITIL is comprehending the goals and strategies of the organization. It's crucial to match the selection of IT equipment with the overall business goals and IT service strategy. In this docking station case, Company needs to understand the goal for selecting docking station from every perspective view (company's budget, capacity, future risks and issues, adjusting with group policies).

2. Service Design: ITIL places a strong emphasis on creating scalable, robust, and dependable services. To make sure the chosen IT equipment can meet the intended level of service, take into account variables like reliability, compatibility, and scalability while making your selection. For docking station issue, company should make wide user requirements and analyze vendor equipment's through market research or customer feedback and ratings. They should involve IT and technical departments, Make proper project management team regarding IT equipment purchasing. Create docking station service prototype to identify the prime requirements, business values. In this way they can be able to implement the proper docking station for the users.

3. Service Transition: ITIL promotes thorough testing and validation during the transition of new equipment to make sure that it performs as intended and seamlessly interacts with current systems. It is important to check with the docking station if it is supported with windows platform? Screen resolution, Power supply, Usb connection support, Bandwidth Ethernet data transfer speeds all are up to the mark or not?

4. Service Operation: This stage is concerned with providing and maintaining services. When choosing IT hardware, take into account its monitoring capabilities, Make sure that IT user support are aware about docking stations firmware and drivers update, has proper documentation and can troubleshoot any issues if occurs.

Weighted scoring Test Criterion:

We will conduct a weighted scoring test criterion from above data to find out the best docking station for the company According to ITIL4 Frameworks.

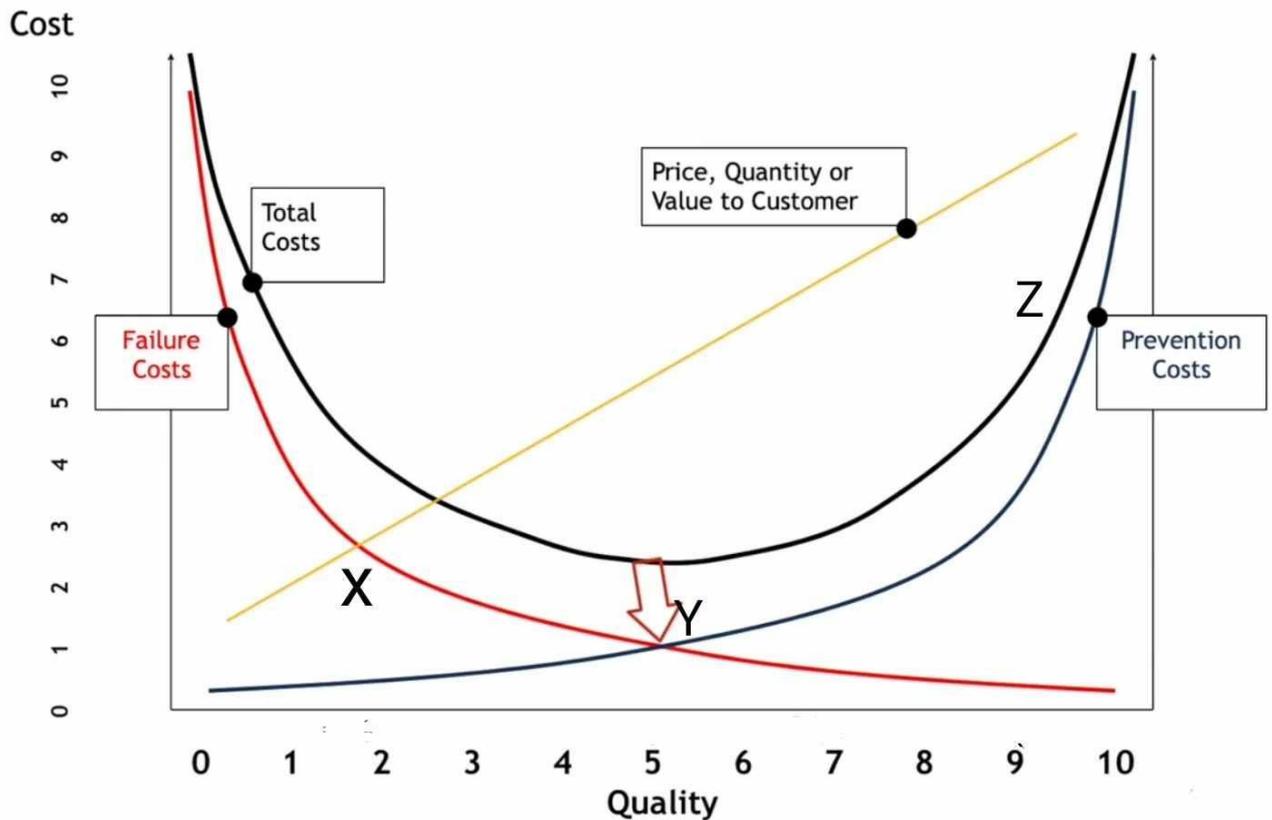
The criteria will be based on **Business values**.

Criteria	Business Values (Weight)	Docking Station X (1-10) lowest	Weight Docking Station X (Weight * Score)	Docking Station Y (1-10) lowest	Weight Docking Station Y (Weight * Score)	Docking Station Z (1-10) lowest	Weight Docking Station Z (Weight * Score)
Price	0.3	10	2	7	2.1	1	0.3
Warranty & Service	0.2	4	0.8	8	1.6	10	2
User experience & Security	0.2	2	0.4	6	1.2	8	1.6
Port Health & data transfer	0.2	2	0.2	6	1.2	10	2

Feedbacks & Documentatio n Support for IT	0.1	2	0.2	5	0.5	8	0.8
Score	1.0		4.8		6.6		6.7

Table 3: Multicriteria Testing(Asset Performance Score)

If we check the test criterion, Docking station z scores the highest and then following up docking station y and then x. However having highest scores doesn't always prove best for the business practices unless it fulfils all the business values. Effective **ITSM** asset services contribute to better control over IT resources, reduced costs, improved compliance and enhanced overall service quality, better user experience. If we analyze docking station z it is best for its warranty service, user experience security, port health data transfer and feedbacks and documentations support for IT. It can fix all the employees arising issues with docking stations but it neglects one of the key business values **price** which management put priority above all of the requirements. Since **ABC** is a new growing sized startup company, the management also should think about the cost reduction and at the same time also the best service outcome with their limited costs. Also the docking station gives additional services (Run multiple platform, can be used with connecting 4 monitors) which are not in the companies requirement list. In this case it won't be a prevention **cost** for the company to select this docking station. They can't also turn back to the docking station x because of it is the best solution for the cost reduction. Selecting **x** docking station will prove a **failure cost** for the company as this docking station can't provide good **service quality**. So in this case the company should think about an optimal solution which can fill up both **quality management** and **cost control**. In this case docking station y proves to be a best option for the company. As it has decent test scores of all the business values requirement and it can be the **best prevention cost** for the company.



Picture 7:Asset Cost-Quality Graph Analysis

4.3 Case Study 2(Improving automation system):

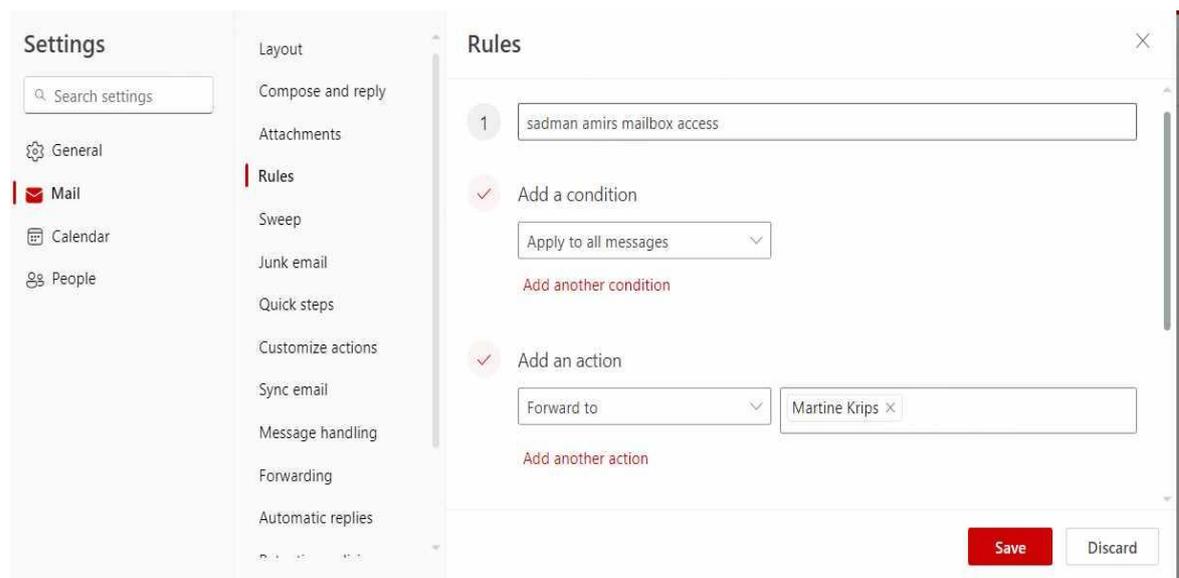
Usually service desk handling team had to deal several tickets every day before escalation. To make easy their works Company may come up with automation systems. While implementing a fully automated system might not always be the best course of action, automation can nevertheless benefit firms in a number of ways. There are some common tasks which can be improvised by using automation system. For Example Mailbox Access, Employee off boarding etc.

Here we will compare between traditional methods and the automation methods one of common tasks.

Mailbox Access (Traditional Way):

Usually employees from same or different branch may needed to access any companies or colleague's mailbox. It can be business reason or covering up any of the colleague's

absences. This could be done manually by setting up mailbox access rules by going through person's mailbox. For doing this some employees may need permission from their branch manager as a matter for business and security process. Persons from different branch needed to set up mailbox access by using remote desktop support. Imagine there are some requests regarding mailbox access and asking for 10/12 people's access. Setting up each of mailbox access rules are tedious and time consuming. Also sometimes it concerns about human errors or security as there are plenty of events and rules which needs to be well understood by service desk team who provides technical supports. For a growing startup company it may create impact on normal business communication and working flows. Here are one demos to providing mailbox access in a traditional way using sharepoint outlook.



The screenshot shows a configuration interface for an email rule. It features three main sections:

- Add an action:** A dropdown menu is set to "Forward to", and a text input field contains "Martine Krips" with a close button (X).
- Add an exception (optional):** A dropdown menu is set to "Before", and a date input field contains "8/31/2023" with a calendar icon and a close button (X).
- Stop processing more rules:** A checkbox is checked, accompanied by an information icon (i).

At the bottom right, there are two buttons: a red "Save" button and a white "Discard" button.

Picture 8: Demo Traditional office 365 mail forwarding

Using the traditional mailbox access method we can set up mailbox access for any user.

Mailbox Access (Using Automation):

The Information Technology Infrastructure Library (ITIL)'s most recent version, ITIL 4, offers advice on best practices for managing IT services. ITIL 4 emphasizes the need of automation throughout the service management lifecycle, even though it doesn't explicitly specify automation processes in the same manner that it does for specific processes like Incident Management or Change Management. The advice in ITIL 4 urges businesses to use automation to boost productivity, cut down on errors, and improve service delivery.

A software program or platform that enables automation of different jobs, processes, or workflows by carrying out predetermined action sequences automatically is known as an automation tool.

Users can develop, configure, and manage automation workflows using the graphical user interface (GUI) or a scripting language offered by automation tools. Depending on the technology and its language, these workflows are frequently referred to as "bots," "scripts," "workflows," or "recipes." Following are some typical categories of automation tools:

Here is a simple demo of creating a scripting tool for mailbox access

```
import datetime

# Simulated mailbox access request details
requester_name = "Sadman Amir"
recipient_name = "Martin Krips"
access_start_date = "2023-08-01"
access_end_date = "2023-08-31"
service_desk_ticket=381123

# Simulated email notification to manager
manager_email = "manager@example.com"
approval_subject = f"Mailbox Access Request for {recipient_name}"
approval_body = f"Dear Manager,\n\n{requester_name} has requested mailbox access for
{recipient_name} from {access_start_date} to {access_end_date} on
{service_desk_ticket}. Please approve or deny this request by clicking on this
button.\n\nThank you,\nIT Team"

# Simulated email response from manager
manager_response = "Approved" # Could be "Approved" or "Denied"

# Simulated approval process
def get_manager_approval():
    # Send an email to the manager requesting approval
    # You would use your preferred email library here to send the email
    send_email(manager_email, approval_subject, approval_body)

    # Simulate receiving the manager's response via email
    # In a real system, you'd need to retrieve and process the email
    return manager_response

# Check if the manager approved the request
```

```

def is_approval_granted(approval):
    return approval.lower() == "approved"

# Main automation script
def automate_mailbox_access():
    # Get manager approval
    approval = get_manager_approval()

    # Check if approval is granted
    if is_approval_granted(approval):
        activate_event_rule()
        print("Access granted and rules activated.")
    else:
        print("Mailbox access request denied.")

# Execute the automation script
automate_mailbox_access()

```

Output Scenario:

For mailbox access IT user support needs to fill up requestor and targeted account names and also needs to mention ticket number as a proof. Then user can set start date and end date and as a security concern and group policy the line manager approval should be marked. Then the create rule event will be activated and through this way IT user support can grant many emails in a short amount time.

The image shows a web form for creating an automation rule. The form is set against a background of a person working at a desk in an office. The form fields are as follows:

- Action required:** A dropdown menu with the selected option "Grant access to mailbox".
- ticket number:** A text input field containing "381123".
- Requester email address:** A text input field containing "samir@crownww.com".
- Targeted account:** A text input field containing "mkrips@crownworldwidgroup.onmik".
- Start Date (yyyy-mm-dd):** A date picker field showing "2023-08-01".
- End Date (yyyy-mm-dd):** A date picker field showing "2023-08-31".
- Approved by Line manager:** A checkbox that is checked.
- Create rule:** A blue button at the bottom right of the form.

Picture 9: Automation Mail forwarding process

4.3 Case Study 3 (Service Design & Categorization):

4.3.1 Request Management Service Design

A client is asking for a new laptop request as there have been some issues with his laptop and also claiming the laptop is much older. Now a bad IT practice for an IT support team is to escalate the ticket directly to the procurement teams and ask to provide a new laptop for the user based on user's complaints.

Without a proper examination by the IT support team, passing a ticket to the procurement team for a laptop replacement request may result in a number of potential problems. Here are various justifications why it isn't a wise move:

Incomplete Information: The IT support team might not have a comprehensive knowledge of the problem without thorough examination. They can be unsure of whether the laptop is actually broken or whether there is a software issue that can be fixed without replacing it. Giving the procurement team false or insufficient information may cause wasteful purchases.

Cost Inefficiency: The cost of replacing laptops can be high, and making unauthorized replacements might put a strain on the company's finances. If the problem is not hardware-related, buying a new laptop might not be necessary..

Lost Productivity: The user may experience downtime while waiting for the new laptop if the request for a replacement laptop is unjustified. This can have a negative effect on their productivity.

Wasted Resources: The time and effort spent by the procurement team on pointless purchases and administrative tasks associated with the replacement will be diverted from more valuable responsibilities.

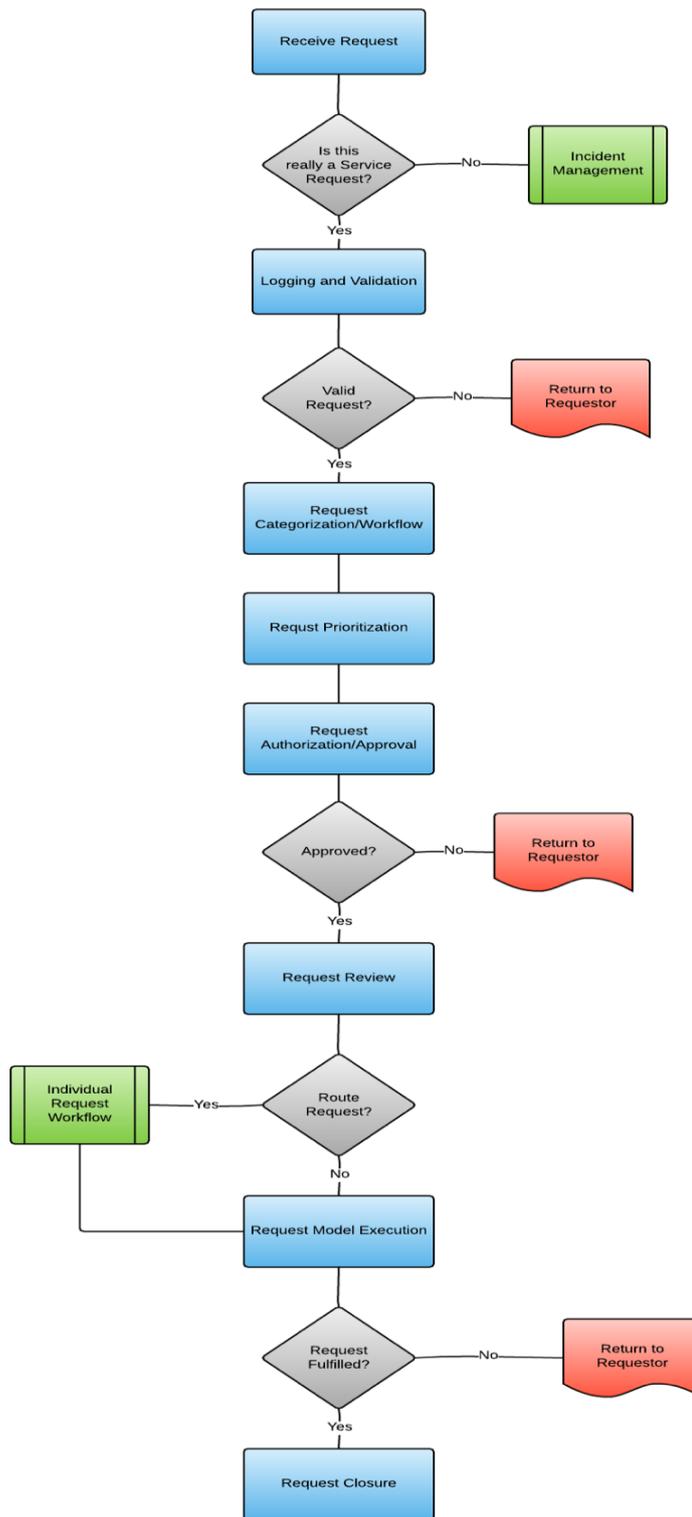
Lack of Accountability: Passing the ticket to procurement without conducting a thorough inquiry may result in a lack of ownership over the problem. It could be challenging to pinpoint the decision-maker if the request to replace the laptop turns out to be unjustified.

User Frustration: If requests are not properly evaluated before being escalated, users may become frustrated. If their laptop needs to be replaced more frequently than necessary, customers might become untrusting of the IT support staff's skills.

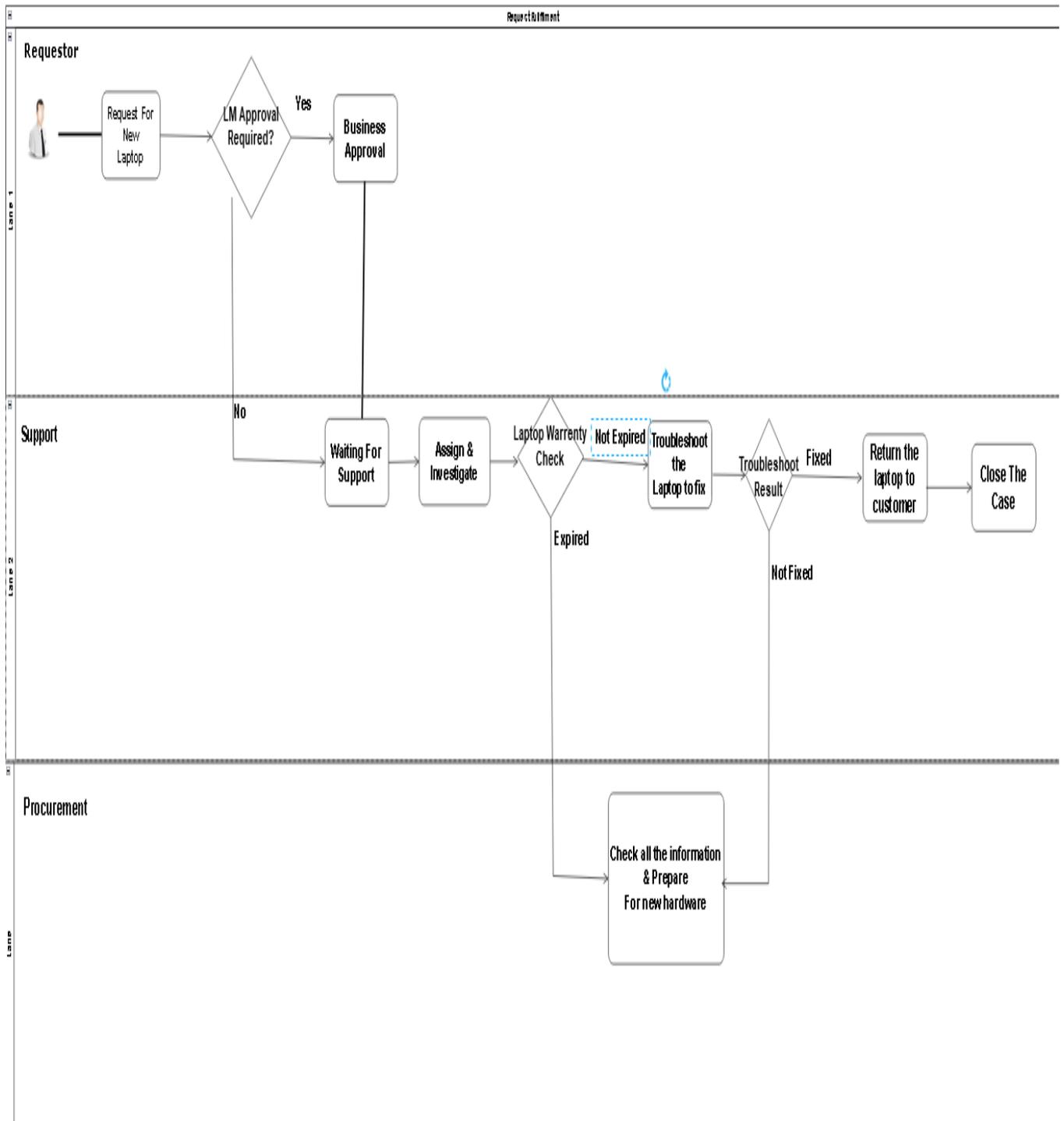
Missed Opportunities for Problem Resolution: The IT support team loses a chance to find and fix reoccurring issues by not looking into the laptop problem's fundamental cause. Instead of addressing the root causes of the problem, this may result in a cycle of regular replacements.

Reputation Impact: The reputation of both the IT support team and the procurement team may suffer if users believe that their problems are not being thoroughly assessed before replacements.

Let's try to create a business process model using the process of ITIL4 **service lifecycle** regarding this hardware related issue.



Picture 10: ITIL 4 Service Desk Request Management(Source: *The official introduction to the ITIL service lifecycle PDF, 2007*)



Picture 11: Use Case Scenario of a Request Management Process through ITIL4

Authentication	Check if the requestor from within organization and has proper domain user rights
Approval	Check if Manager approval needed or not
Service Ownership	Categorize Request service and assign to IT team for investigation
Warranty	Check if the laptops warranty lifecycle expired or still active
Investigation	Check if the laptop can be fixed or not
Documentation	Make documentation if the issue fixed and close the ticket. If the issue not fixed document all details and pass to procurement team
Review	Review the IT documentation and decide whether to ship new laptop or needs further investigation

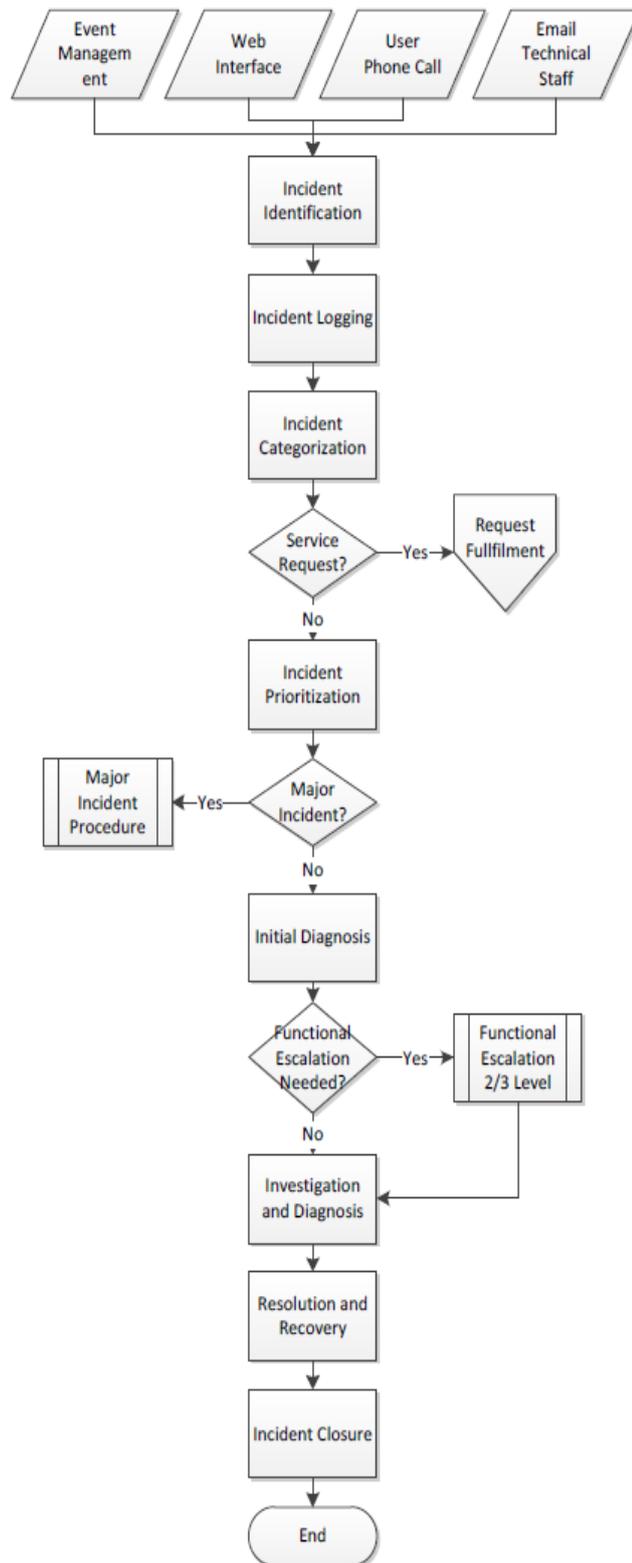
Table 4: Use Case Scenario Output

4.3.2 Incident Management Design:

Since most of the companies now have been adapted **hybrid workspace** after **Covid 19** incidents. So it is also necessary to provide best services to the employees who are working remotely.

It is easy to access the workspace from office internal network. But it is a challenging matter when talking about accessing the workspace from remotely with any shared or external networks. Companies need a proper secure way to allow user's access to internal network without compromising security. **VPN** is the best choice for the companies to solve this problem. Using **VPN** service now many organizations employees are able to work remotely. But the problem occurs when people have issues with VPN or anything on their workspace while working remotely, they won't find instant support from IT team which they could get while working in office. In this case IT support team can remotely assist those users to solve the issue. But sometimes it may be hard for IT team to find out the actual cause and that may needs escalation. It may consumes much time for that employee as he/she can't work remotely until the issue fixed or if they don't have any spare corporate device which has no **VPN** issue and they can be able to work. Similar one cases happens that one day some employees of ABC company working remotely but their vpn is not connecting. They get some error message and then tries to contact service desk team.

Using **ITIL4** Practices the issue categorized First L1 teams should check with the **knowledge and incident management**, If the issue needs to be escalated then the advanced team (L2/L3) needs come up with **release and configuration management**.



Picture 12: Incident Management Standard Procedure (Source: (The official introduction to the ITIL service lifecycle PDF, 2007)

Gather Information (L1 Task) : Start by getting thorough information about the problem from the client. Inquire in detail about the error messages, the symptoms, and the time the issue first appeared. Also needs to check companies internal device network monitor whether any server or network related to that vpn connection is down or not?

Establish the VPN's kind (client-to-site, site-to-site, etc.), as well as the client software that is being utilized.

Isolate the Issue (L1 Task) : Determine whether the problem only affects the client's device or whether it affects other users as well. This aids in determining if the issue is client- or system-related.

Check Connectivity (L1/Advanced Team Task) : Make sure the client's internet connection is reliable and working properly by checking it. VPN performance may be impacted by inconsistent or poor internet connections.

Check VPN Client Software (L1 Task) : Verify that the VPN client software is up to date.

Check Network Settings (Advanced Team Task) : Ensure that the client's network settings are not conflicting with the companies VPN requirements. Check for IP address conflicts, router settings, and firewall rules.

Check VPN Server Status (Advanced Teams Task) : Verify if the VPN server is not experiencing any downtime or maintenance.

Review VPN Logs (Advanced Team Task) : Check the VPN client logs for any cautions, error messages, or other hints of a connectivity problem. Logs might offer insightful information about the issue.

Test Different Servers & Devices (Advanced Team Task) : If available, have the client try connecting to various VPN servers. It indicates a best way to think about having company an alternative vpn server as primary vpn's downtime recovery support. This can assist in figuring out if the problem is isolated to a single server.

To test the VPN connection, request that the client use a different device, such as a smartphone or another PC. This makes it possible to determine if the problem is device-specific.

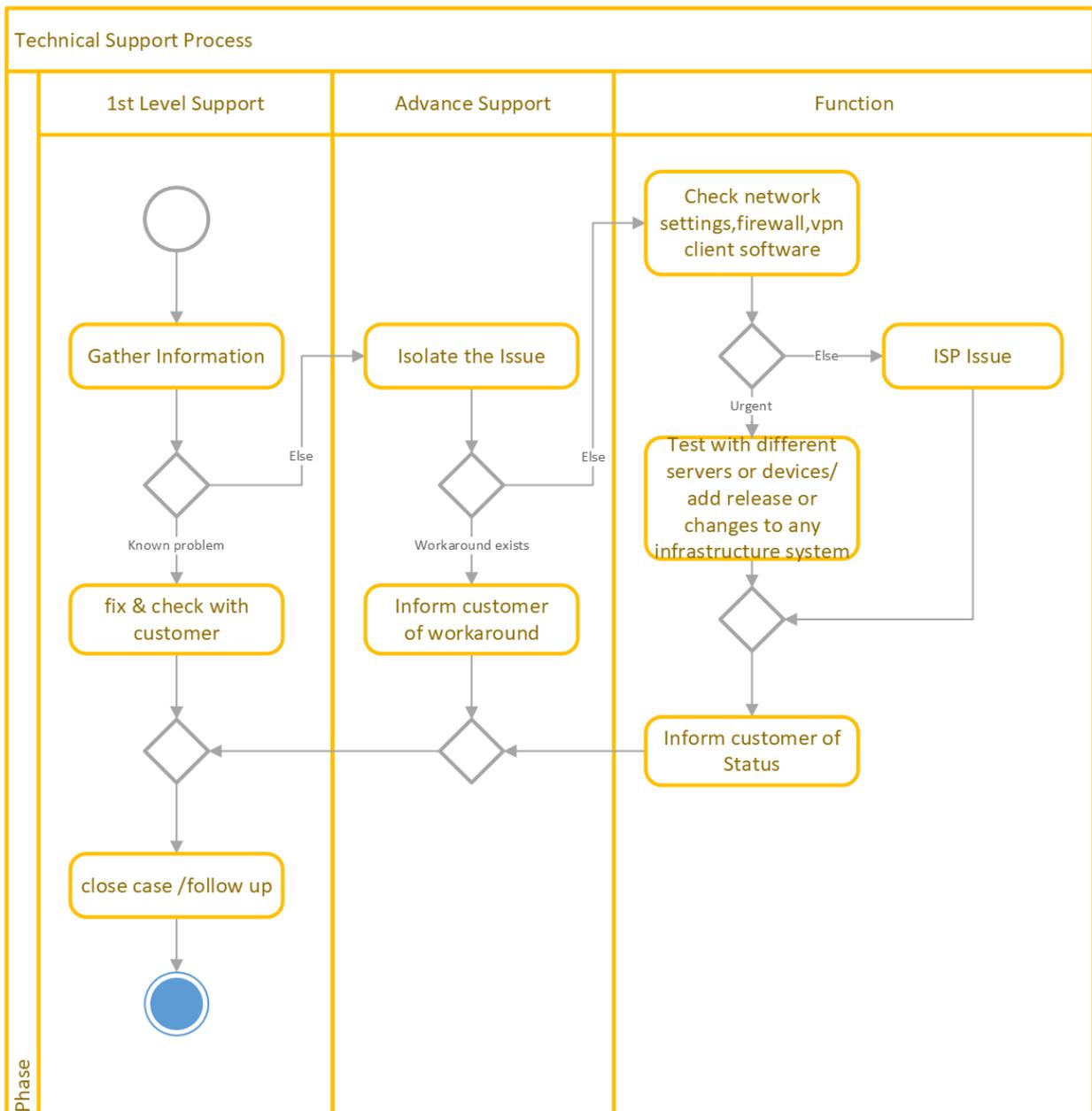
Check Firewall and Security Software (Advanced Team Task) : Ensure that companies' firewall or endpoint security software is blocking the VPN traffic. Temporarily disable such software for testing purposes.

Check for ISP Restrictions (Technician/Client Task) : It is need to Investigate whether the client's Internet Service Provider (ISP) is imposing any restrictions on VPN traffic.

Try Different Protocols (L1/Advanced Team) : Try switching between different VPN protocols (e.g., OpenVPN, L2TP, PPTP) to see if the issue is protocol-specific.

Follow Up (L1) : After implementing a solution, follow up with the client to ensure that the issue is fully resolved or the issue persists.

Document the Solution (L1) : Keep records of the issue and the steps taken to resolve it to the KB Documents for future troubleshooting.



Picture 13: Use Case Scenario of Incident Handling Process

Post-incident analysis: Root cause analysis: IT teams conduct root cause analysis to identify the factors that led to vpn connection failures and minimize the risk of future incidents to other customers.

We have identified preventive measures for Process Improvements: The IT team reviewed the incident management process and identified areas for improvement, including: B.

Optimize communication protocols and deploy automated monitoring tools to identify potential problems early.

Knowledge Base Updated: The IT team has updated the Knowledge Base with lessons learned from the incident, including troubleshooting steps and preventative measures, to help with future incidents.

4.4 Case Study 4: Release Management & Continuity Improvement

ABC Company relies heavily on its IT infrastructure to support its online operations. Company has experienced many disruptions from software releases in the past, resulting in decreased sales and customer dissatisfaction. To address these issues, company decided to implement a formal Release and Continuity Management Program (RCIM).

Challenges: Company faced many challenges in managing software releases, including:
Lack of Structured Release Process: ABC did not have a well-defined process for planning, planning, and executing software releases. This often resulted in unplanned developments and disruptions to business operations.

Manual Change Control: ABC's change control process was manual and labor-intensive, making it difficult to track changes and ensure they were properly implemented.

Improper Testing: ABC did not have a rigorous testing process, resulting in software being released with errors and defects.

Poor Communication: ABC did not have a clear communication plan for software releases, which often led to confusion and frustration among users.

RCIM Implementation: To address these challenges, ABC has implemented a comprehensive RCIM program that includes the following steps:
Release Process Development: ABC has developed a structured release process that included roles and responsibilities for each individual.

Stakeholders and schedule for each phase of the release.

Implementation of Configuration Management Tools: ABC has implemented configuration management tools to track and manage changes to software configurations.

Introducing CI/CD pipelines: ABC introduced CI/CD pipelines to automate the process of building, testing, and deploying software.

Creating an Infrastructure as Code (IaC) approach: ABC has developed an IaC approach to infrastructure deployment and management to improve infrastructure consistency and reliability.

Establishment of a Monitoring and Alert System: ABC has established a monitoring and alert system to identify and respond to potential problems.

5 Results and Discussion

In the practical part some of the key areas of organization have been discussed and after doing case studies on them we bring some possible outcome for the organization.

Case Study One: (Improving IT Procurement)

Result:

Let's check the Analysis outcome for **ITSM** Approach.

1. **Service Oriented Approach:** The Company came up with better service quality with limited cost.
2. **Alignment with Business Goals:** Company has specific business goals when selecting any assets for the company. Those goals should be fulfilled for the better business outputs.
3. **Metrics and Reporting:** Company Collected and analyzed data related to service performance, user satisfaction, and operational efficiency allows for informed decision-making and advancement initiatives.
4. **Cross-Functional Collaboration:** Collaboration between many teams and departments, including IT, business units, and external partners, is necessary for successful ITSM.

Case Study 2: (Improving automation system)

Result:

ITSM doesn't explicitly address "mailbox access" automation, it does offer principles and best practices that can be applied to access management processes, including mailbox access.

Here's how ITSM principles align with using automation for mailbox access:

Efficiency and Consistency:

ITSM places a strong emphasis on how important these factors are while providing IT services. By eliminating human work and ensuring that access is allowed or denied consistently in accordance with specified standards, automation can assist streamline the process of providing and revoking mailbox access. Through this way other access like one drive, setting auto reply, Reset Multifactor authenticator, and Reset Microsoft password can be possible.

Service Request Management:

Within ITSM, the service request management process handles user requests in a structured and efficient manner. Automation can be used to handle mailbox access requests as service requests, Requests for mailbox access can be handled automatically as service requests, ensuring that all essential approvals and provisioning processes are taken.

Workflow Automation:

ITSM promotes workflow automation to make sure that procedures are well defined and consistently followed. Predefined routines for mailbox access can be created using automation, including seeking authorization from the proper authorities.

Access Control and Security:

Access control and security are highly prioritized in ITSM. By using automation, access regulations can be enforced, mailbox access can be automatically granted or denied based on user roles, and access may be kept in compliance with security requirements.

Integrating identity management:

ITSM understands the significance of identity and access management. To make sure that mailbox access complies with user identities and roles, automation can be coupled with identity management systems.

In summary, adopting automation for email access aligns nicely with ITSM principles. Organizations can manage mailbox access more effectively, more securely, compliantly, and with a better user experience by introducing automation in line with ITSM best practices.

Case Study 3: (Service Design & Categorization)

- **Request Management Process**

Result:

If we see the above case study analysis through **ITSM** we can get these key factors.

1. Every request needs to be passed through according to some procedures.

2. Some service request may requires **LM** approval with valid business reasons.
3. Escalating any service request ticket to other team needs to investigate whether it is needed to pass or can be solved by current teams?
4. Gather all information regarding the request and make note to them so that it can be understandable for the escalation teams.

- **Incident Management Process**

Results: The incident was quickly resolved, business interruption was minimal, and business operations returned to normal. The IT team has identified the root cause of the failure and implemented preventive measures to reduce the likelihood of future incidents.

The IT team has improved its incident management process to handle future incidents more efficiently and effectively.

Analysis Through ITSM: Effective incident management requires clearly defined processes, qualified personnel, and clear communication channels. Proactive measures such as regular network maintenance and proactive configuration can help prevent incidents from occurring. Continuous learning and improvement is essential to maintaining a robust IT infrastructure and incident response capabilities.

- **Case Study 4: Release Management & Continuity Improvement**

Results: Implementing RCIM has provided ABC with significant benefits, including:

Reduced downtime: Reduced downtime by 70% due to software-related issues.

Software quality improvements: After implementing RCIM, ABC's error rate decreased by 50%.

Cost savings: ABC saved 20% in software development and maintenance costs by eliminating rework and reducing the need for support.

Improved agility: ABC can now release software changes 25% more frequently after implementing RCIM.

Analysis Through ITSM: ABC learned several valuable lessons from implementing RCIM, including: The importance of a structured release process: A release process helps ensure that the planning, execution, and delivery of software releases are communicated.

Benefits of automation: Automation helps streamline the approval process and reduces the risk of human error.

The Importance of Testing: Thorough testing is essential to ensure that the software is reliable and meets user expectations.

The need for clear communication: Effective communication is essential to keeping stakeholders informed and minimizing disruption to business operations.

Discussion:

So the results provide us the benefits which ITIL represents

- Elevating IT Service Quality
- Enhancing Customer Satisfaction
- Implementation of Best Software Lifecycle Methodology according to project based
- Strengthening IT Governance and Compliance
- Automating tedious and time consuming tasks
- Empowering IT Professionals

6 Conclusion

In summary, this thesis is dedicated to user support services, with a particular focus on small businesses and growing startups. During the presentation, a brief introduction to new trends in economics and the emergence of service science was made. Next, we formally define user support as a service. The third chapter is devoted to presenting an overview of standardized approaches to user support, primarily from the widely accepted ITIL best practice framework and the ISO 20000 standard. Response of the standardized method in the third chapter to the conditions of a small IT company. This chapter begins by setting goals and analyzing the specifics of a growing startup. Next, it provides a detailed description of common tasks in today's real-world IT departments with detailed descriptions of process models using ITIL4 methods and recommendations. Implemented to make ITSM better.

That way, the entire service lifecycle will be covered and the framework will provide growing startups with most of the benefits of industry standards, but in a compact and accessible form. As a result, more companies adopt these best practices, ultimately improving the overall quality of service in the IT market.

Another possible extension is the application of the framework in other domains. In this case, the benefits will outweigh all that because companies outside of the tech sector don't pay much attention to standards and so these best practices are barely known to them. Therefore, the improvement benefit can be substantial in these companies. Although it is designed primarily for businesses, we believe that our framework can be easily applied to any type of business as the principles used should be universal. Therefore, the only task left is to find suitable areas that can benefit from this work.

7 References

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8. List of pictures, tables, graphs and abbreviations

8.1 List of pictures

Picture 1: ITIL Evolution(12 Pages)

Picture 2: Service Value Chain (14 Pages)

Picture 3: ITIL 4 Dimensions (16 Pages)

Picture 4: Organizational Asset (19 Pages)

Picture 5: ITSM Process (22 Pages)

Picture 6: ITIL4 Practices (23 Pages)

Picture 14:Asset Cost-Quality Graph Analysis (39 Pages)

Picture 8: DemoTraditional office 365 mail forwarding (40 Pages)

Picture 15: Automation Mail forwarding process (44 Pages)

Picture 10: ITIL 4 Service Desk Request Management (46 Pages)

Picture 16: Use Case Scenario of a Request Managment Process through ITIL4 (47 Pages)

Picture 17: Incident Management Standard Procedure (50 Pages)

Picture 18: Use Case Scenario of Incident Handling Process (53 Pages)

8.2 List of tables

Table 1: Differences between ITSM & ITI (27 Pages)

Table 2: Customer Satisfaction survey (31 Pages)

Table 5: Multicriteria Testing (38 Pages)

Table 6: Use Case Scenario Output (48 Pages)

8.3 List of abbreviations

ITIL-Information Technology Infrastructure Library

ITSM-Information technology service management

ISO-International Organization for Standardization

SVS-Service Value Chain

LM-Line Manager

RCMP-Release and Continuity Management Program

SLA-Service Level Agreement

SD-Service Desk

KB-Knowledge Base

VPN-Virtual Private Network

GP-Group Policy

