

**RADBANK LTD.**

**GENERATING BUSINESS VALUE BY IMPROVING  
THE EFFICIENCY AND EFFECTIVENESS OF IT SERVICES**

Consulting Report  
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# 1. INTRODUCTION TO THIS REPORT

**RADBANK** is an Australian bank that provides Retail Banking, Lending, Wealth Management and Mobile Banking services to its 16 million customers. (Stern, 2020e, p.3). However, recently their business value (in the form of profits) has not increased as much as the Bank would like. (Stern, 2020e, p.3). A **recent review** of RADBANK therefore has recommended the Bank to improve **the efficiency (lower cost)** and **effectiveness (achieve the desired business outcomes)** of its IT services. (Stern, 2020e, p.3). Hence, this is now one of the Bank's specific goals. (Stern, 2020e, p.3).

There are **two areas** that have been identified for improvement such as The efficiency and effectiveness of some components of the **IT infrastructure** (i.e. the servers and the Mobile Banking app) that fall well below industry benchmarks and needs to be replaced and **the management of the planning, design/sourcing, transition/integration, operation, and improvement of IT services** which is not well organized and needs to be made more efficient and effective. (Stern, 2020e, p.5). The IT infrastructure includes two major issues which comprises the **Mobile Banking which no longer reflects current needs** and largely consists of monolithic legacy code along with **servers reaching capacity** and are unable to meet the growing demand. (Stern, 2020e, p.5). We have been asked to evaluate whether, and how, Outsourcing and ITSM can deliver the desired improvements in efficiency and effectiveness in the areas identified by a previous review in order to generate more business value for RADBANK. (Stern, 2020e, p.3).

In order to resolve the above-mentioned issues and achieve efficiency and effectiveness, RADBANK should inculcate Resource Pooling, On Demand Self-Service, Measured Service and Broad Network Access while transitioning to outsourcing. (Harding, 2011, p.4). Firstly, **Resource Pooling** will help in maximizing the use of computing resources of server capacity for RADBANK which in turn will minimize their cost because they can assign pooled resources dynamically. (Harding, 2011, p.6). Secondly, **On Demand Self-Service** will help RADBANK in achieving efficiency by authorizing the users to request the resources on run time based on their utility. (Harding, 2011, p.4). Thirdly, **Measured Service** can scale their server capacity and storage needs as per the requirement. (Harding, 2011, p.11). Lastly, **Broad Network Access** will help RADBANK in maximizing their market access. (Harding, 2011, p.6). Moreover, in order to improvise the management planning and make it more efficient and effective as per the RADBANK's requirement, The RADBANK should utilize the Best practices of ITIL life cycle such as service strategy, service transition, Service design and service operation. Each recommendation has addressed the specific RADBANK's issues and provided the solutions for the challenges such as **Service strategy** offers various management plans to support the management strategy such as business relationship management, service portfolio management, etc. which in turn will help in delivering optimal services while balancing the cost, risk and time (Head& Spafford,2017, p. 3, p.4, p.8). Secondly, **service transition** which promotes change management & provides flexibility for betterment (Head& Spafford, 2017, p. 2). And **Service design** validates the strategies which have been approved in service strategy phase & delivers the efficient deliverable as per the SLA (Head& Spafford,2017, p. 4). Lastly **Service Operation** also helps to achieve the effectiveness by incident & problem management as well it offers tools & techniques to the senior-level manager to monitor the process (Stern, 2020b, p.22, p.30)

The aforementioned recommendations are based on characteristics of Outsourcing and ITSM and the benefits they provide. In this report we have also discussed the challenges, risks, costs

associated (with Outsourcing and ITSM) and how to manage them. Apart from this we have discussed how IT Governance could enhance the efficiency and effectiveness.

## 2. OUTSOURCING

### 2.1 DEFINITION OF OUTSOURCING

“Outsourcing is the business practice of hiring a provider outside an organization to provide services for functions that were previously performed in-house by the organization’s own employees, or new functions.” (Stern, 2020d, p.18).

### 2.2 CHARACTERISTICS OF OUTSOURCING

In this section, we will explain the main characteristics related to Outsourcing. We have chosen to discuss those which we perceive as most relevant to RADBANK’s background and requirements. We will discuss On-demand self-service, Broad Network access, Resource Pooling and Measured Service. (Harding, 2011, p.4).

**On-demand self-service** is “a cloud computing technique for a Consumer who can **unilaterally provision computing capabilities**, such as server time and network storage, as needed automatically **without** requiring **human interaction** with each service’s provider”. (Harding, 2011, p.4). It enables the provisioning of Cloud resources on demand whenever it is required and is accessed through a **web based self-service portal** without requiring human interaction. (Harding, 2011, p.4). Organizations can make use of a web portal as an interface to access their cloud accounts to check their cloud service, their usage and also to provision or de-provision the services. (Harding, 2011, p.4). An example of on-demand self-service is Netflix World’s leading Internet subscription service for movies and TV shows who migrated from its own data centers to AWS (Amazon Web Services) because it was hard for them to predict usage and to provision sufficient capacities as the year on year customers using streaming is increasing. (Harding, 2011, p.5). Thus, On-demand self-service is responsible for provisioning of resources in order to maximize the effectiveness and efficiency while managing the outsourcing. (Harding, 2011, p.5).

Another characteristic of Cloud Computing is **Broad Network Access**. (Harding, 2011, p.5). Broad Network Access is a technique in which “**Capabilities are available over the network** and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and personal digital assistants (PDAs)”. (Harding, 2011, p.5). It refers to the resources hosted in a private cloud network are available for access over the network by using **various devices** such as **mobile devices and workstations**. (Harding, 2011, p.5). In case of natural disaster or Power Failure, organizations can access the data stored in Cloud from anywhere. (Harding, 2011, p.6). For example, a company might use cloud services to implement a web site to give its customers product information. (Harding, 2011, p.5). That company needs network access to purchase and configure the cloud services, and to manage and operate its web site, and its customers need network access to use the web site. (Harding, 2011, p.6). Hence, Broad Network Access is

responsible for implementing added services that can be successfully used by anyone, anywhere on the globe, using a variety of devices. (Harding, 2011, p.6).

Furthermore, **Resource Pooling** is also another Cloud Computing technique which refers to “the **provider’s computing resources** that are **pooled** to serve **multiple consumers** using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of **location-independence** in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data center). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.” (Harding, 2011, p.6). It basically relates to multiple customers that are serviced from the same physical resources by securely separating the Cloud resources on logical level. (Harding, 2011, p.6). It helps in maximizing the use of computing resources and minimizing their cost because they can assign pooled resources dynamically to meet demand by allowing cloud service providers to maintain their maximum service levels with minimum resources. (Harding, 2011, p.6). Example of Resource Pooling is Public Cloud, since it is used by different organizations via public internet based on pay as you go model. (Harding, 2011, p.7). Therefore, in Resource Pooling, the cloud resources are grouped together in order to maximize the advantage and minimize the risk. (Harding, 2011, p.8).

Another technique of Cloud Computing is **Measured Service** which refers to “**Cloud systems** that automatically **control and optimize resource use** by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). **Resource usage** can be monitored, controlled, and reported providing transparency for both the provider and consumer of the **utilized service**.” (Harding, 2011, p.10). This basically means that consumers only pay for the computing resources they have used. (Harding, 2011, p.11). It is similar to the utilities like water or electricity. (Harding, 2011, p.11). Hence, it allows the organization to scale their server capacity and storage needs as per the situation and will be charged based on resources they use i.e. Pay as you go basis. (Harding, 2011, p.11). An example of Measured Service is Amazon AWS (Amazon Web Services) in which they charge as per the usage. (Harding, 2011, p.11). Therefore, Measured Service allows effective usage of resources with predictive planning in terms of billing. (Harding, 2011, p.11).

In this section, we have demonstrated various characteristics of cloud computing which helps us understand the range of adoptive activities involved in carrying out a characteristic for maximizing the effectiveness and efficiency while managing the outsourcing.

### **3. GENERAL BENEFITS CREATED BY THOSE CHARACTERISTICS AND HOW THEY ARE CREATED**

In this section, we will explain the benefits of Outsourcing related to the characteristics mentioned in the above section. We have chosen to discuss those benefits which are most

relevant to RADBANK's background and requirements. We will discuss the benefits of On-demand self-service, Broad Network access, Resource Pooling and Measured Service.

Firstly, **On-demand self-service** allows the Consumers to **obtain cloud services** – at the infrastructure, platform, or application level – **whenever they want, without** requiring **significant assistance**. (Harding, 2011, p.4). This is generally done using an easily accessible and user-friendly online system in case of on-demand self-service. (Harding, 2011, p.4). In the case of IaaS, for example, this might enable the user to start virtual machines, assign network addresses, and allocate storage. (Harding, 2011, p.4). In some situations, particularly with private cloud where payment is not needed, the service provider will still give the consumer the ability to configure resources and schedule their use. (Harding, 2011, p.5). It helps in achieving efficiency in terms of lower IT cost by allowing the users to request the resources on run time based on their utility and no need to pay extra wages to the expert staff. (Harding, 2011, p.5). It also helps in achieving better effectiveness by focusing more on their specialty, hence the expertise is more than the customer. (Harding, 2011, p.5). Therefore, on-demand self-service helps in speeding the delivery of IT projects that are critical to revenue growth because procure and provision are done in a faster way. (Harding, 2011, p.5).

Secondly, **Broad Network Access** allows a company to **implement added services** that can be successfully used by anyone, **anywhere on the globe**, using a variety of devices. (Harding, 2011, p.6). Network access is needed to establish the initial provider/consumer relationship, for subsequent use of the cloud services themselves, and for use of added services that the consumer may implement using the cloud services. (Harding, 2011, p.5). For example, a company might use cloud services to implement a web site to give its customers product information. (Harding, 2011, p.5). That company needs network access to purchase and configure the cloud services, and to manage and operate its web site, and its customers need network access to use the web site. (Harding, 2011, p.6). It can help Commercial companies to maximize the market access. (Harding, 2011, p.6). In case of natural disaster or power failure, the organizations can manage and access the data stored in cloud from anywhere across the globe without any data loss. (Harding, 2011, p.6). Therefore, broad network access helps in business growth because the work can be carried out without any interruptions. (Harding, 2011, p.6).

Thirdly, **Resource Pooling** allows the cloud service providers to **maintain maximum service levels** with **minimum resources**. (Harding, 2011, p.6). For consumers, this means high QoS at low cost. (Harding, 2011, p.6). It is a major reason why cloud computing is expected to succeed. (Harding, 2011, p.6). The concept of resource pooling includes location independence. (Harding, 2011, p.8). For providers, having resources in convenient locations means lower costs whereas having them in diverse locations means that services can be maintained in the event of loss of a data center, of power, or of network connectivity. (Harding, 2011, p.8). This in turn translates to higher quality and lower cost for consumers. (Harding, 2011, p.8). As far as their use of the services is concerned, consumers no need to know what the underlying resources are or where they are located. (Harding, 2011, p.8). It helps in collaborating in a cloud environment giving the business an ability to communicate and share more easily outside of the traditional methods. (Harding, 2011, p.8). It helps in maximizing the

use of computing resources and minimizing their cost because they can assign pooled resources dynamically to meet demand by allowing cloud service providers to maintain their maximum service levels with minimum resources. (Harding, 2011, p.6). Resource pooling also helps providers in achieving elasticity which means that a resource that is no longer needed by one consumer can be allocated to another consumer that needs more resources. (Harding, 2011, p.9). Hence, Resource Pooling provides maximum utilization by increasing robustness against component failures and better ability to handle localized surges in case of traffic. (Harding, 2011, p.8).

Lastly, **Measured Service** provides **services to be charged on a per-use basis** which means that usage must somehow be measured. (Harding, 2011, p.11). Consumers have the benefit to select the optimum service to meet their needs along with that they need to know whether the selected service is performing in accordance with their SLAs and whether their use of the service is as expected. (Harding, 2011, p.11). It allows the consumers to be charged based on the resources they used (per instance or per CPU time), the charging unit has changed to hourly to secondly (actually minutely for most providers). (Harding, 2011, p.11). It helps the organization to scale their server capacity and storage needs to achieve better effectiveness according to the requirement and will be charged based on the resources they use i.e. pay as you go model which in turn lowers the cost and helps in achieving efficiency. (Harding, 2011, p.11). Therefore, Measured Service enables control and optimizes the resource usage. (Harding, 2011, p.11).

In this section, we have demonstrated various benefits of cloud computing with respect to the characteristics mentioned in the above section which helps us understand the various advantages involved in implementing a characteristic for achieving better results while managing the outsourcing.

#### **4. GENERAL CHALLENGES, COSTS, AND RISKS AND HOW TO MANAGE THEM**

In this section, we will explain the challenges of Outsourcing related to the characteristics mentioned in the above section. We have chosen to discuss those risks and the ways to mitigate them which are most relevant to RADBANK's background and requirements. We will discuss Vendor lock-in, dependency on reliable internet connection, vendor management, data security, compliance with regulations, and performance in accessing data, change management.

The most important risk relates to **Vendor lock-in** as it is a major barrier to the adoption of Cloud Computing **due to lack of standardization**. (Harding, 2011, p.34). Vendor lock-in or proprietary lock-in is a case in which the client using a product cannot transition to a peer product. (Harding, 2011, p.34). It is due to the technologies or other standards that are incompatible with each other. (Harding, 2011, p.34). Vendor lock-in refers to when an organization is constrained due to its overreliance upon a service provided by a single vendor. (Harding, 2011, p.34). Vendor lock-in occurs when applications developed for specific Cloud Platforms, for example, Amazon EC2(Elastic Compute Cloud) or Microsoft Azure cannot be easily migrated to other cloud platforms because the services and resources of cloud provider

do not match with each other. (Harding, 2011, p.34). It can be overcome by carefully purchasing cloud facilities from multiple service providers and assuring from the start that the services are compatible with other providers along with understanding the requirements from all ends. (Harding, 2011, p.34). It is also necessary to evaluate the vendor's exit terms carefully before signing an agreement. (Harding, 2011, p.34).

Another challenge of Cloud Computing is **Dependency on reliable internet connection** since **downtime** is a significant challenge of cloud technology. (Harding, 2011, p.34). Also, in a shared environment, whenever the data is transferred between different computers, there is a possibility that the transfer can be intercepted in case of an unreliable internet connection. (Harding, 2011, p.34). To overcome this, dedicated networks and Intranets can be used because companies with an untrusted internet connection will think twice before adopting for cloud computing and also to avoid failures due to internet connectivity. (Harding, 2011, p.34).

Furthermore, **Vendor management** as it requires a different approach since the SLA's are critical. (Harding, 2011, p.34). To overcome this, priorities the tickets and resolve them as soon as possible. (Harding, 2011, p.34). Including third party vendors in cloud business models have given rise to security concerns. (Harding, 2011, p.34). To mitigate this issue, many cloud providers are undertaking formal third-party security evaluations, such as International Organization for Standardization (ISO). (Harding, 2011, p.34). Vendors need to understand their plans and timing to resolve integration issues and introduce new functionality and improvements. (Harding, 2011, p.34).

Moreover, **change management** and testing can also be a challenge especially in shared environments. (Harding, 2011, p.34). The process of change management is therefore a serious management issue because it will determine the success of the organizations in cloud computing implementation since the implementation of cloud computing brings about a change in the way organizations carry out their daily activities. (Harding, 2011, p.34). Proper change management practices should be put in place in order to overcome issues as a result of change. (Harding, 2011, p.34).

Apart from all of these, In case of **Resource pooling**, since consumers no need to know what the underlying resources are or where they are located, this in turn creates major risk such as **data security, compliance with regulations, and performance in accessing data** which is why location may become highly relevant. (Harding, 2011, p.8). In shared environment, errors or attacks can happen where one tenant can access resources of another tenant. In such an attack, the attacker gets complete access to the data or resources of various customers. (Harding, 2011, p.8). In order to avoid this, providers may give a choice of location, at least to the extent of continent or country, or may say where they operate. (Harding, 2011, p.8). There have to be certain levels of protection effectively built into the application service such as routine back-ups and multi-data center and even multi-country hosting. (Harding, 2011, p.8).

In this section, we have demonstrated various challenges of cloud computing with respect to the characteristics mentioned in the above section which helps us understand the various ways



to mitigate those risks involved in achieving better efficiency and effectiveness while managing the outsourcing.

## 5. IT SERVICE MANAGEMENT (ITSM)

### 5.1 DEFINITION OF ITSM

“IT service management a set of related activities that enable an organization to maximize business value from IT. By planning, designing/sourcing, transitioning/integrating, operating, and improving IT services” (Stern, 2020a, p.24)

### 5.2 CHARACTERISTICS OF ITSM

In this section of report, we will explain the main characteristics of the formal set of processes for managing the lifecycle of IT services known as IT Service Management (ITSM). There are various ITSM characteristics available, which will help the organization to maximize its business values. **There are a few of the characteristics: Service Strategy, Service Operation, Service Transition, Service Design and Continual Service Improvement (CSI).**

Firstly, **Service strategy** is the heart of the ITSM service life cycle, whose Value creation begins here with understanding organizational objectives and customer needs (Stern, 2020a, p.26). Every organizational asset including people, processes, and products should support the strategy (Stern, 2020a, p.26). The Service strategy gives an intrinsic understanding of how the business would give the most value to the customer (Orr, 2012, p.3). In this lifecycle, various strategic meetings and management plans such as **Business relationship management, Service portfolio management, Financial management, SLA & catalogue** creation will help the organization to ensure to obtain an efficient goal with effectiveness (Stern, 2020a, p.28). Therefore, all these management plans and the strategic meeting will assist the heart of the Service Lifecycle” Service Strategy” because it is the first step towards achieving efficiency and effectiveness.

Secondly, **Service design** phase contributes by ensuring the creation of cost-effective services that provide the level of quality required to satisfy customers and stakeholders throughout the life of the service (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 3: Service Design, para.4). A well-established service design ensures and consistently provides the required level of quality and alignment to business and customer needs. (Griffiths., Lawes., Brewster. and Sansbury., 2016, Chapter 3: Service Design, para.6). Therefore, it achieves the effectiveness, by adhering & following the management plans which had been finalized in Service strategy phase (Orr, 2012, p. 10).

Thirdly, **Service transition** bridges the gap between the development and operations departments within IT, which helps in implementation of new or changed services (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 4: Service Transition, para.1). It makes sure that the operational requirements are fully considered and catered for before anything is moved into the live environment, including documentation and training for users and support staff (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 4: Service Transition, para.1). The new or changed service design is acquired from the Service Design stage which leads to the testing and analysis of whether the service meets the needs of the business and deploys it within the production environment (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 4: Service Transition, para.2). There are various job roles of transition such as **assets and configuration management, service validation and testing, CMDB and SKMS**, etc. (Stern,

2020b, p.20). It offers various management plans and mentioned job roles which will assist an organization to achieve efficiency such as **Change management**, it is the most important management plan that assists the organization to implement the changes internally and externally, as per the business objective and situation demand (Stern, 2020b, p.15). It implements all the changes by adhering to the SLA's points, Service validation, and testing (Stern, 2020b, p.18). The objective of service validation and testing is to ensure that a new or changed service and its associated release process will meet the needs of the business at the SLA's agreed cost and **CMDB & SKMS**, contains all the information of items, the resources, staffs record of the supplier, providers, etc this means that whenever a change to some aspect will be proposed, these information enables the rapid and accurate assessment of the impact of the change on services and components which in result it saves the time & cost whereas it enhances the productivity and performance of the services (Stern, 2020b, p.19).

Fourthly, **Service Operation** mainly responsible for keeping things running according to agreed levels – making sure the service is working and fixing it quickly when it goes wrong. (Stern, 2020b, p.22). Service operation works on one belief that if services are not utilized or are not delivered efficiently and effectively, they will not deliver their full value, irrespective of how well designed they may be (Stern, 2020b, p.22). The service operation provides the managers and practitioners with knowledge which allows them to make better decisions in areas such as managing the availability of services, controlling demand, optimizing capacity utilization, scheduling of operations and avoiding or resolving service incidents and managing problems (Orr, 2012, p.7). **It offers incident and problem management**, that helps providers to tackle all the unplanned incidents which will stop the services to be fully utilized (Stern, 2020b, p.30). It also **offers capacity management**, which triggers the performance monitoring, so, if providers get the performance metrics to meet their expectations then automatically, they will be able to achieve the efficient outcome (Stern, 2020b, p.30). Hence, by using various management processes the service operation ensures the efficiency of the service and overall process.

Lastly, **CSI** provides a repeatable and effective way to identify the improvement area to any service lifecycle (Stern, 2020c, p.11). It is based on **the Plan-Do-check-act cycle** (Stern, 2020c, p.13). The main task of the CSI is to check the alignment of the delivered services with the agreed terms So, it means it checks the overall performance of the ITSM process (Stern, 2020c, p.9). It is the key to deliver the service effectively because it offers a repeatable and effective way to identify and apply an improvement to any aspect of service provision in any part of the service lifecycle (Griffiths, Lawes, Brewster, & Sansbury, 2016). Continual Service Improvement: CSI provides value to the customer by ensuring better strategy, design, transition, and operation of the service (Orr, 2012, p.8). CSI ensures that all the changes that are necessary in the previous stages are identified and implemented. (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 6: Continual Service Improvement, para.1).

Therefore, it is very imperative to understand the ITSM process and their characteristics because they are the key attributes to maximize the values of the service for the organization. Because they offer specific solutions for specific service relevant obstacles. Moreover, these characteristics have various benefits and solutions as per the business objectives.

## 6. GENERAL BENEFITS CREATED BY THOSE CHARACTERISTICS AND HOW THEY ARE CREATED

In this section, we are going to describe the benefits of the ITSM related to the characteristics mentioned in the above section. We have chosen to discuss those benefits which are most relevant to RADBANK's background and requirement. We are going to discuss the benefits of Service strategy, Service Design, Service transition, Service operation and Continual Service Improvement that can be used to improve performance and obtain an efficient and desired outcome.

Firstly, **The Service strategy** delivers the benefits by brainstorming sessions and engagement of business leaders from the start with the organizations to understand their objectives, needs & defining realistic achievable goals (Stern, 2020a, p.26). The Service strategy gives an intrinsic understanding of how the business would give the most value to the customer (Orr, 2012, p.3). It helps in achieving value not only based on quantifiable benefits such as profits or financial savings but also in terms of benefits including service quality which depends on the perception of the customer or service user and It helps in evaluating the customer's perspective through which the service provider can understand both the customer and the outcomes that the customer really values and why, to what extent they are valued (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 2: Service strategy, para~24 (Value)). In order to achieve the goal, it offers various management plans such as **Business relationship management it gives the flexibility** to both provider and customers, and it also ensures that if customer's business demands change then the provider will be able to adapt the changes over time and respond accordingly (Stern, 2020a, p.28). **Financial Management gives the bigger picture of the cost of providing and managing IT** services to both customer and provider (Stern, 2020a, p.28). It also gives a clear picture of the budget and helps both parties to optimize the cost, (Stern, 2020a, p.28). SLA will be finalized in this stage of lifecycle which contains the agreement policies and guidance etc. which will mainly ensure alignment and the compliance of the terms, as a result, it will mitigate the conflicts (Orr,2012, p.10). Therefore, by following the above-mentioned benefits, an organization can achieve efficiency and effectiveness.

Secondly, **Service Design**, the benefit of Service Design is that it helps to maintain the Service catalogue, Service portfolio management, provides the proper documentation of a mix of services which is provided by the provider in order to meet the business requirement (Stern, 2020a, p.33). It increases **the effectiveness by maintaining the continuity of services, conformance to standards and regulation as per the agreed strategy for design**, Strategy is the input and the providers will be able to forge the services according to the SLA and gets one step closer towards giving their services (Stern, 2020a, p.33). Service Design covers design principles and methods for converting strategic objectives into portfolios of services and service assets (Orr, 2012, p.7). It also includes the changes and improvements necessary to increase and maintain value to the customers over the lifecycle of services (Orr, 2012, p.7). Many times, while discussing & maintaining the service portfolio, requirement analysis and negotiation of SLA, the associate or people get the idea about the task which motivates them.

So, by adhering the agreed-on method, then it would be easy to achieve an efficient desired goal.

Thirdly, **Service Transition** offer benefits in terms of management plan such as change management, it gives the flexibility to the process and plans if any inevitable changes or up-gradation comes across, then the organization will take new actions quickly and adapt the changes and act accordingly to increase the value of their business at the same time they will also monitor the risks associated with it (Stern, 2020b, p.15). The service transition provides more value using **the CMDBs and SKMS, gives the benefit to the providers to manage the resources allocation and utilization** that are relevant to the IT services such as the skills of technical staff; records of suppliers and partner requirements, abilities and skills (Stern, 2020b, p.19). Therefore, by using those information's the provider will exactly know the ability of resources, which type of resources are needed, where to implement the changes and how to implement so, they can utilize those resources accordingly which increases the service values by delivering better service more efficiently & also mitigates the budget overrun problems by optimizing the cost and saves time(Stern, 2020b, p.19). Therefore, it increases productivity and efficiency because providers check the achieved output with the agreed outcome and if they find that their performance report is not up to the agreed term or if modification or change is required to achieve the efficient outcome then they would implement the required management plans (Stern, 2020b, p.15).

Fourthly, **Service operation** also offers the benefits in terms of the management plans such as **incident management**, if service gets disrupted by an unplanned incident, for example, laptop hardware & performance issues, server breakdown issues, etc then the incident management process has available to tackle the situation without disturbing the flow of service delivery (Stern, 2020b, p.28). Furthermore, the **Problem management** offers the benefits to resolve the deeply rooted IT infrastructure problems which the incident manager is unable to resolve from his end then they prioritize the issue and transfer to the problem manager and his team then for that problem management has available, it will analysis the root cause of the problem and provide the resolution by eliminating the recurring events and identifying the potential weakness (Stern, 2020b, p.32). The main benefits which we obtain from Service operation are that this service will give the control and provides tools to manager and practitioners to supervise the whole process and assure whether their services can achieve effective and efficient services (Stern, 2020b, p.22). Therefore, incident, problem management, and other management are the method to obtain the benefits, their main objective is to maintain the continuity of the Services whereas it also Coordinates and carry out the activities and processes required to deliver the services to business users and customers and manage them at agreed levels (Stern, 2020b, p.27).

Finally, **CSI** is most important because the benefits which we get after the successful implementation of CSI are that it repeatedly validates the process and provide the feedback for the area of improvement which in result to deliver the most efficient, effective, and SLA' agreed on service delivery to the customer (Stern, 2020c, p.11).The performance of the IT provider is continually measured, and improvements are made to processes, IT services and IT infrastructure in order to increase efficiency, effectiveness, and cost (Griffiths., Lawes.,

Brewster. & Sansbury., 2016, Chapter 6: Continual Service Improvement, para.1). Another benefit of CSI is the CSI register, if implemented, it records all the small to big changes according to the measured benefits and priority of the change and is implemented to provide improved services. (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 6: Continual Service Improvement, para.12(Delivering improvements)). IT organizations always seek improvements, so, to achieve an improved version, providers use CSI because it will closely measure the performance of service activity as defined in the strategic meetings and give feedback on whether the activities or processes can deliver the services as per plan or not (Stern, 2020c, p.12). Therefore, by analysing all the service life cycle's phases such as strategy, design, transition, etc and it gives a constructive recommendation for improvement (Stern, 2020c, p.15). Hence, it provides a better & efficient value of services because it basically identifies the errors or obstacles and continually tries to eliminate the issue and then deliver it to the customer. So, the customer is getting a more efficient service than earlier (Stern, 2020c, p.11).

Therefore, it has been proven that the main objective of the ITSM service lifecycle is to maximize business value from IT. By using their services such as strategy, operation, transition, design, and CSI.

## **7. GENERAL CHALLENGES, COSTS, AND RISKS AND HOW TO MANAGE THEM**

To deliver the optimal services, there are numerous methods available in the market such as ITSM. Despite the availability and usability of services, it is very challenging to achieve the efficient desired output because various risks come with the benefits of the method. Despite, the I&O leaders and other experts have suggested the plans and methods overcome such issues. Therefore, in this section, we are going to talk about the challenges, risks, and the method to overcome those challenges.

Starting with **Service strategy** which faces numerous challenges in order to achieve desired goal such as Senior-level attention to project objectives, metrics and governance are essential for success, but difficult to sustain because most of the time a senior-level leader does not fully engage in project governance, marketing, and communication (Head& Spafford,2017, p.1). The second challenge is to identify the efficient leader because it is very Difficult to understand and identify the business objective if the appointed manager is not qualified enough (Head & Spafford, 2017, p.1). However, there are uncountable risks associated with all the challenges. For instance, if the appointed manager is not skilled enough then he won't be able to hold the team and due to this communication gap would develop, which is not good for the service delivery and if he does not conduct the meeting with the stakeholder to keep them informed about the status of the service development or does not share the obstacles/ issues, then this mistake could result in cost budget overrun and without the proper communication, it might be possible that team won't be able to deliver agreed deliverable and time of delivery might also get extend (Head& Spafford,2017, p.3,p.4, p.5). Nevertheless, various solutions have been proposed to overcome such shortcomings. The solutions are "Engage the business leaders from the start, so that their viewpoints are well-accounted-for, to drive the initiatives to achieve the strategic priorities and goals, senior-level engagement will ensure the proper communication among team, stakeholders & customers (Head& Spafford,2017, p.2, p.4, p.5). Set up a task force combining business leaders with IT operations leaders and create IT service and process priority lists. If the business leaders and I&O leaders work in sync then the requirement analysis

would be coherently generated and the team would get a clear objective (Head& Spafford,2017, p.4). Therefore, the solutions will try to overcome the shortcomings and race to achieve the desired goal.

Similarly, **Service design** also faces various challenges such as Negotiation on the SLA, because few times it happened that the agreed-on methods are not the feasible and practical ones, getting familiar with the changes, maintenance of service catalogue because it is hard to make the list of all the resources initially because initially except the business leaders, no other ones have the idea about terms and tasks and the Selection of tools and technique (Stern, 2020a, p.33). The associated risks are very huge because if requirement analysis or business understanding is not clear to the associates then the ITSM project could fail (Head& Spafford,2017, p.2). However, various solutions have been presented such as Encourage I&O teams to look beyond the established frameworks such as ITIL (Head& Spafford,2017, p.2). Publicize and reward instances of operations teams collaborating with colleagues in development, architecture, security, and the business Head& Spafford,2017, p. 2). Management must incorporate organizational change as a central part of its initial and ongoing planning in ITSM and Ensure that the reasons for ITSM are relevant to the goals and objectives of the organization Head& Spafford,2017, p. 3). Management must define and communicate a vision for service management that establishes why it matters in terms of creating and protecting value relative to organizational goals (Head& Spafford,2017, p. 3).

Next comes **service transition**, like service strategy , service transition also faces various challenges to implementing the transition stages and one of the biggest challenges is the transition of people's behaviour towards change and convincing them that the change is the only key to deliver more efficient service (Head& Spafford,2017, p.3). Because Most of the time I&O team rigidly adhere the ITIL practices, their blind trust in the ITIL framework sometimes costs them in the form of project failure because of the development of the digital business and rapid innovation, there are other unknown situations can occur and sometimes ITIL won't be able to solve the issue (Head& Spafford,2017, p.2). Another challenge is to maintain the CMDB and SKMS, if they are not updated or cautiously managed then the transition would be very difficult because the provider will not the information of Configuration items, resources, skilled person's ability, etc. (Stern, 2020b, p.19). The risks associated with it that budget overrun, the deadline of service delivery extended (tracking the error is not easy due to the inability to maintain the CMDB) and the delivered service would not be efficient and desired one because of the improper CMDB will not be able to assign the skilled resource to the specific problem (Stern, 2020b, p.19). However, various solutions have been presented by Ian Head & George Spafford's article, Encourage I&O teams to look beyond the established frameworks such as ITIL. Publicize and reward instances of operations teams collaborating with colleagues in development, architecture, security, and the business. When it comes to accepting the change, the organization must incorporate change management as a central part of its initial and ongoing planning in ITSM (Head& Spafford,2017, p.2).

Coming to **Service operation**, the most important challenge is to appoint a skilled person for the role of supervision and monitoring, the person who is monitoring all the tasks should be skilled enough and even if he is skilled, the other challenge is about his sustainability and engagement (Head& Spafford,2017, p.4). The other challenges are to endure the calmness because organizations at maturity Levels 1 and 2 are at high risk of poor tool selection and implementation. Service improvement initiatives can easily become tool implementation projects and the team can lose sight of the original business goals (Head& Spafford,2017, p.6). Be wary of heavily customizing an established toolset. Customizations tend to corrupt the designed methodologies of the tools and will add significant cost to upgrades (Head&

Spafford,2017, p. 6). Though, Ian Head & George Spafford's has shared the opinion of I&O leaders & experts in her article, which can be considered as a solution to above mention challenges Resist the pressure to invest in tools until the maturity of the people (human factors), processes and business management of operations is higher than IT Score Level 2 (Head& Spafford,2017, p.6). If tool investments are unavoidable, consider the use of lower-cost, tactical point solutions, rather than the implementation of major service management suites to limit the cost and risk exposure. Avoid heavy tool customization (Head& Spafford,2017, p.6). Moreover, the involvement of more senior business leaders could guide and assess the appointed leader who is responsible to hand tools and techniques to supervise (Head& Spafford,2017, p.4).

Lastly, the challenges that **CSI** faces are unavoidable, i.e. to monitor & manage the effectiveness of Deming Cycle which is based on these steps: Plan, Do, check & act (Stern, 2020c, p.11). The Deming Cycle is used to improve the service management processes (Stern, 2020c, p.133). So, it is a very crucial challenge to manage the effectiveness because if any step fails to produce optimal deliverable then the CSI will not be able to give efficient & optimal improvement feedback (Stern, 2020c, p.15). Consequently, its impact will emerge into the form of risks i.e. the duration of service delivery would cross the deadline, the cost of producing the deliverable would increase, which means budget overrun (Head& Spafford,2017, p.3). However, the solution for these challenges is Proper management structures, like an ITSM steering group, need to be put in place or leveraged if existing, to gain the perspectives of senior business leadership relative to what must change, and the status of efforts, risks, etc(Head& Spafford,2017, p.3). They must also ensure the proper balance of people, process, technology, and business management changes (Head& Spafford,2017, p.3). In a large enterprise, there will also be program and project management layers beneath the steering group, to coordinate the actual execution of direction that the steering group established. Both layers are concerned with selecting and managing the indicators of project success (Head& Spafford, 2017, p. 5).

Hence, the providers or leaders could face numerous challenges when it comes to achieving the desired optimal goal however, the senior leaders, ITIL experts & authors have suggested various methods to overcome such obstacle.

## **8. EVALUATION OF IMPACT OF METHODS ON EFFICIENCY AND EFFECTIVENESS OF RADBANK'S IT SERVICES (RELEVANCE MAP)**

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AREA IDENTIFIED FOR IMPROVING THE EFFICIENCY AND EFFECTIVENESS OF IT SERVICES	OUTSOURCING CHARACTERISTICS	OUTSOURCING BENEFITS OF CHARACTERISTICS	ITSM CHARACTERISTICS	ITSM BENEFITS OF CHARACTERISTICS
1A. SERVER CAPACITY 1B. MOBILE BANKING APP				
Efficiency	<p><b>Resource Pooling</b> - It refers to multiple customers that are serviced from the same physical resources by securely separating the Cloud resources on logical level. (Harding, 2011, p.6).</p>	<p>It reduces costs by cheaper acquisition and provision of services such as servers (1A). (Harding, 2011, p.6). It also helps in Optimizing the computing resources of server capacity (1A) of RADBANK which in turn lowers the cost because they can assign pooled resources dynamically to meet demand by allowing cloud service providers to maintain their maximum service levels with minimum resources. (Harding, 2011, p.6).</p>	<p><b>Strategy:</b></p> <p>Value creation begins here with understanding organizational objectives and customer needs. Every organizational asset including people, processes and products should support the strategy (Stern, 2020a, p.26).</p>	<p>By using strategic management and many brainstorming sessions, we will advise the most efficient service means that the server will give flexibility to server capacity whenever the load gets increased, and the solution will be cost-optimized (Stern, 2020a, p.28).</p>
	<p><b>On Demand Self Service</b> - It enables the provisioning of Cloud resources on demand whenever it is required and is accessed through a <b>web based self-service portal</b> without requiring human interaction. (Harding, 2011, p.4).</p>	<p>In case of Server Capacity (1A) and Mobile Banking App, (1B) RADBANK no longer requires to pay wages to expert staff which in turn lowers the IT costs and can focus on their specialty. (Harding, 2011, p.4). RADBANK can achieve efficiency by authorizing the users to request the resources on run time based on their utility. (1A) (Harding, 2011, p.4).</p>	<p><b>Service Transition</b></p> <p>It mainly describes how to transform an organization's one state into another while also maintaining the risks and knowledge for business support. There are various job roles of transition such as assets and configuration management, service validation and testing, CMDB and SKMS, etc. (Stern, 2020b, p.15)</p>	<p>As per SLA, it gives the flexibility to the process and plans if any inevitable changes or up-gradation comes across the RADBANK, then we will take new actions quickly and adapt the changes and act accordingly to increase the value of their business at the same time they will also monitor the risks associated with it. It increases the service values by delivering better service more efficiently. (Stern, 2020b, p.13)</p>



	<b>Measured Service</b> - This basically means that consumers only pays for the computing resources they have used. (Harding, 2011, p.11). It is similar to the utilities like water or electricity. (Harding, 2011, p.11)	It reduces costs by providing detailed statistics and projections of usage and costs of servers (1A). (Harding, 2011, p.11). Allows highlighting areas of over expenditure. (Harding, 2011, p.11). RADBANK can scale their server capacity and storage needs as per the situation and they will be charged based on resources they use i.e. Pay-as-you-go basis. (Harding, 2011, p.10).	<b>Best Practices</b>  ITIL represents the learning experiences and thought leadership of the world's best-in-class service providers. (Orr, 2012, p.10)	By using the best practices and their expert suggestions we will try to achieve the effectiveness because best practice contains footmarks, experience, and learnings of the process experts. So, imitating their practices or utilizing their learning will augment the chance of maximizing the business value. (Orr, 2012, p.10)
Effectiveness	<b>Broad Network Access</b> - It refers to the resources hosted in a private cloud network are available for access over the network by using <b>various devices</b> such as <b>mobile devices and workstations</b> . (Harding, 2011, p.5).	It can help RADBANK in maximizing their market access because greater the accessibility of their services, greater is the potential for sales. (1B) (Harding, 2011, p.6). In case of Natural disaster or Power Failure, RADBANK can recover the Mobile Banking (1B) App data from cloud without any extra effort and cost. (Harding, 2011, p.5).	<b>Service Operation</b>  It is mainly responsible for keeping things running according to agreed levels –making sure the service is working and fixing it quickly when it goes wrong. (Stern, 2020b, p.22)	Whenever a RADBANK will face an unplanned incident which hinders the continuity of the service, then service operation assists the services by using tools, techniques, and expertise, it will reduce the errors or eliminate the repetitive part and try to align the task as per the agreed policies and terms. So, in this way, we will try to achieve the effectiveness. (Stern, 2020b, p.30).
	<b>On Demand Self Service</b> - It enables the provisioning of Cloud resources on demand whenever it is required and is accessed through a <b>web based self-service portal</b> without requiring human interaction. (Harding, 2011, p.4).	It allows quick seamless provision of more servers when server capacity is running low (1A) (Harding, 2011, p.4)		

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<b>2. PLAN, DESIGN/SOURCE, TRANSITION/ INTEGRATE, OPERATE, IMPROVE IT SERVICES</b>				
Efficiency		Do not fill this column out.	<b>Service Design</b>  The service design stage helps to ensure that the new services will perform as planned and deliver the functionality and benefits intended by the business after the organisation has decided the IT strategy it wishes to pursue (Griffiths., Lawes., Brewster. & Sansbury., 2016, Chapter 3: Service Design, para.1)	It operates on various management plans such as Service catalogue, Service portfolio management, Business relationship management etc. that provides the information of the resources and the associated skills or attributes. So, the information will help us to utilize the resources as per the requirement & in return it will assist us to meet the business requirement (Stern, 2020a, p.26). It will increase the effectiveness by maintaining the continuity of services, conformance to standards and regulation as per the agreed strategy for design.
			<b>Service Transition</b>  It mainly describes how to transform an organization's one state into another while also maintaining the risks and pieces of knowledge for business support. There are various job roles of transition such as assets and configuration management, service validation and testing, CMDB and SKMS, etc. (Stern, 2020b, p.15)	It uses CMDB & SKMS, which contains the configuration information, skilled labor information, resources information, etc. So, whenever a change is required then without wasting any time providers could allocate their resources because they have all the information about the assets, they can easily track the location of the error. So, it saves time and cost and assists the provider to deliver the better and efficient services because they have allocated their best resource for specific tasks. (Stern, 2020b, p.19)

		<b>Service strategy</b>  Value creation begins here with understanding organizational objectives and customer needs. Every organizational asset including people, processes, and products should support the strategy (Stern, 2020a, p. 26).	It is beneficial for RADBANK'S various segments such as financial management (helps in managing the budget), Service strategy (provides a better strategy for IT operations, and involves internal and external stakeholder's requirements for the operation), Demand management (SLA maintenance), etc. The main goal of these management plans is just to generate efficient output for the RADBANK (Stern, 2020a, p.27).
Effectiveness		<b>Best Practices</b>  ITIL represents the learning experiences and thought leadership of the world's best-in-class service providers.  (Orr, 2012, p. 10)	By following the few best practices, we will ensure the optimal result to the RADBANK because best practices contain the footstep of the successful, efficient, and optimized process for the specific problem. (Orr, 2012, p.10)
		<b>SLA</b>  It is a service level agreement, that contains all the requirements and	It will mainly ensure compliance between providers and RADBANK's requirements. For instance, if disaster recovery, Service availability, security, etc. are mentioned in the SLA then both the parties will perform their tasks accordingly

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		clauses of both the parties (Stern, 2020b, p.13).	without any conflicts (Stern, 2020b, p.13).
		<b>Service Operation</b>  It is mainly responsible for keeping things running according to agreed levels –making sure the service is working and fixing it quickly when it goes wrong. (Stern, 2020b, p.22)	By using service operation we will provide better supervision and efficient tools with knowledge which allows us to make better decisions in areas such as managing the availability of services, controlling demand, optimizing capacity utilization, scheduling of operations which will help in providing better and improved services (Orr,2012, p.7).

## 9. RECOMMENDATIONS FOR IMPROVING THE EFFICIENCY AND EFFECTIVENESS OF IT SERVICES WITH OUTSOURCING AND IT SERVICE MANAGEMENT, BASED ON THE RELEVANCE MAP

### 9.1 EFFICIENCY

“Getting the most output from the least input – i.e. optimisation” (Stern, 2020a, p.12).

#### 9.1.1 OUTSOURCING

- According to the ongoing issue related to RADBANK such as the servers reaching full capacity and unable to meet the growing demand, we recommend moving to Cloud and utilize **Resource Pooling** which will help in maximizing the use of computing resources of server capacity for RADBANK which in turn will minimize their cost because they can assign pooled resources dynamically to meet demand by allowing cloud service providers to maintain their maximum service levels with minimum resources. Therefore, it will reduce costs by cheaper acquisition and provision of services such as servers. Therefore, in Resource Pooling, the cloud resources are grouped together in order to maximize the advantage and minimize the risk.
- RADBANK requires readable availability of resources due to current servers reaching full capacity which can be addressed by **On Demand Self-Service**. It will help RADBANK in achieving higher efficiency by authorizing the users to request the resources on run time based on their utility. RADBANK no longer requires to pay wages to expert staff for managing both their servers and Mobile Banking App which in turn lowers the IT costs. We recommend RADBANK to reduce in-house IT specialist skills as RADBANK can make use of a web portal as an interface to access their cloud accounts to check their cloud services, their usage and also control provision of their servers.
- In order to manage their servers, we also recommend utilizing the **Measured Service** which will allow RADBANK to pay for the computing resources they have used. It is similar to utilities like water or electricity bills. It will help RADBANK in reducing their costs by providing detailed statistics and projections of usage and costs of servers. RADBANK can also scale their server capacity and storage needs as per the situation and they will be charged based on resources they use i.e. Pay-as-you-go basis. Hence, RADBANK can make effective use of resources with predictive planning in terms of billing.

#### 9.1.2 ITSM

- On the basis of RADBANK’s problem we would recommend Best Practices of ITIL Service Strategy. We will conduct strategic management meetings, and many brainstorming sessions, that involve the Senior-level I&O leaders to project objectives, metrics and governance for success of ITSM project. On the basis of the meetings, we will advise the most efficient & best practices that will try to achieve the effectiveness because best practice contains footmarks, experience, and learnings of the process experts which will improve the server’s capacity as well as it provides flexibility to the server’s capacity. So, whenever the load increases, the server will automatically adjust to their best and the overall solution will also be cost-optimized. It will also recommend the best practices of ITIL, that will improve the management aspects of RADBANK by improving the Business, Financial, service portfolio Plans. The strategic meeting and

the Management plans will also enable projects to estimate the cost, timing, resource requirement and the risks associated with them more accurately.

- The second recommendation would be ITIL Service Transition as it will ensure that RADBANK can keep up with the new or modified changes in the environment. It will also ensure that RADBANK can achieve its goal and objectives and increase the business value by adapting to the changes and by making sure that all the business goals and objectives are achieved. Service transition will help in planning and managing changes in the server and the mobile banking app effectively and efficiently by offering change management and problem management. It will also help in managing the risks that will be related to the new changes such as server overload. Service transition will also help in deploying these changes effectively into the supported environment with CMDB and will provide knowledge about the provided service and service assets with the help of SKMS.

## 9.2 EFFECTIVENESS

“Making sure that the effort is directed to the desired outcome” (Stern, 2020a, p.12).

### 9.2.1 OUTSOURCING

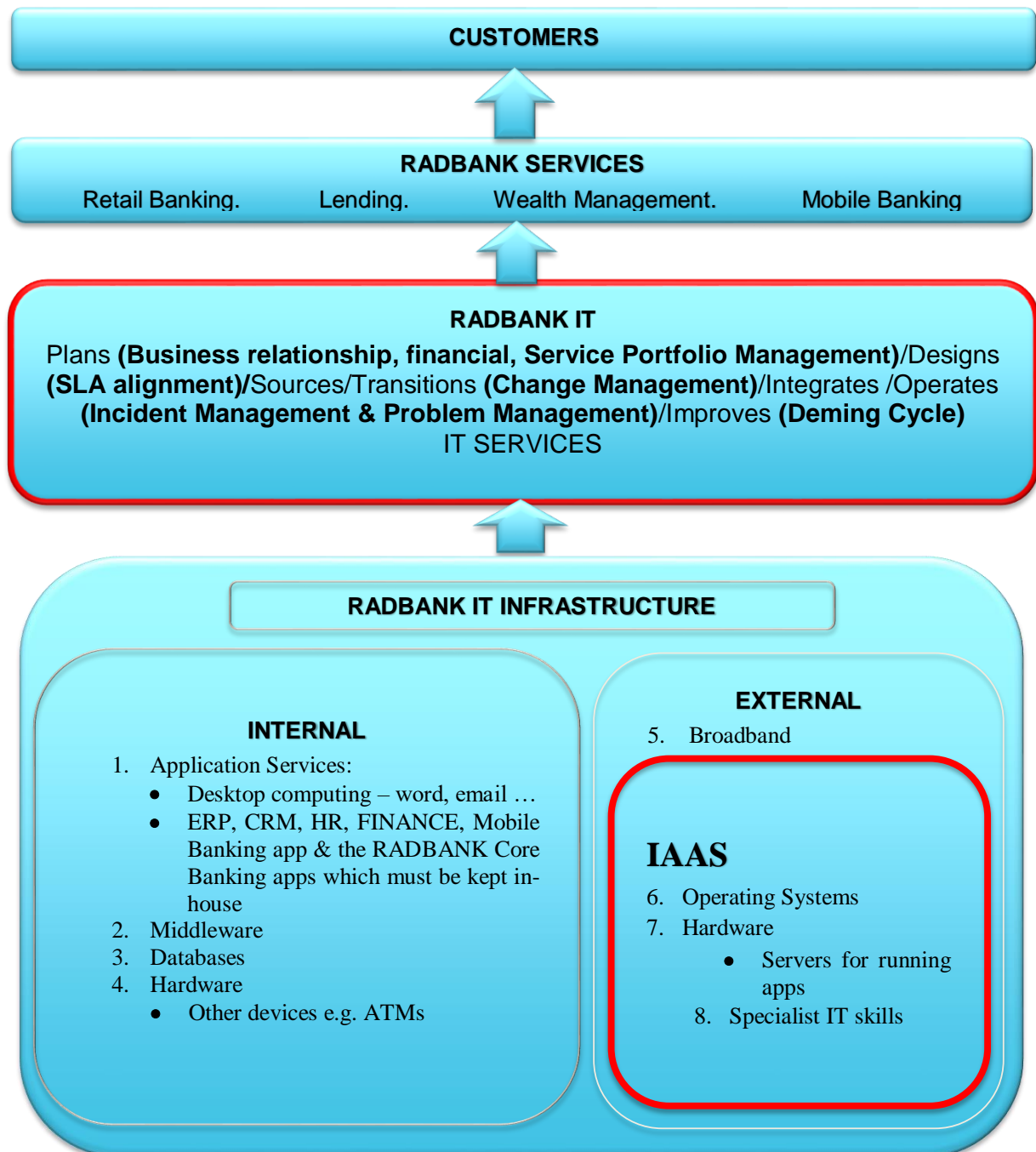
- In order to resolve the Mobile banking App issue, we highly recommend to utilize the **Broad Network Access** which can help RADBANK in maximizing their market access because greater the accessibility of their services, greater is the potential for sales. RADBANK can use Broad Network Access in order to connect its Banking App to newer systems and for transition from the legacy code. In case of Natural disaster or Power Failure, RADBANK can recover the Mobile Banking App data stored in Cloud from anywhere without any extra effort and cost.
- In order to achieve effectiveness in terms of Server Capacity and get rid of the ongoing issue, we recommend using **On Demand Self-Service** which allows quick seamless provision of more servers when server capacity is running low. RADBANK can focus more on their specialty since it can enable the provisioning of Cloud resources on demand whenever they are required and is accessed through a web based self-service portal without requiring human interaction.

### 9.2.2 ITSM

- In order to improve the effectiveness, we would recommend the best practice of ITIL i.e. **Service Design**. By applying service design, the requirements for new or changed services for RADBANK will be evaluated after which the requirements will be analysed, documented, and will be agreed on by the officials. A solution design according to the requirement is produced which would then be compared with the strategy to increase the effectiveness and will ensure that it conforms to corporate and IT policies. Also, in the Design stage management information systems and the tools would be reviewed which will make sure that they can support the new changes.
- Other characteristics that we would recommend to the RADBANK's is from the best practice of ITIL i.e. **Service Operation**. As we know that the bank operates at rapid changes due to the competition, so in order to monitor those implemented changes and to validate the alignment of obtained deliverables with the planned deliverable we will use service operation. It will provide better supervision and efficient tools with

knowledge which allows us to make better decisions in areas such as managing the availability of services, controlling demand, optimizing capacity utilization, scheduling of operations which will help in providing better and improved services. During the lifecycle of RADBANK, RADBANK will face an unplanned incident which will hinder the continuity of the service, then service operation assists the services by using tools, techniques, and expertise, it will reduce the errors or eliminate the repetitive part and try to align the task as per the agreed policies and terms. So, in this way, we will try to achieve effectiveness.

### 9.3 DIAGRAM OF PROPOSED CHANGES TO RADBANK'S INTERNAL AND EXTERNAL IT INFRASTRUCTURE BASED ON RECOMMENDATIONS



## 10. MANAGING CHALLENGES, COSTS, AND RISKS ASSOCIATED WITH THESE RECOMMENDATIONS

In this section, we will explain the challenges of the recommendations mentioned in the above section. We have chosen to discuss those risks and the ways to mitigate them which are most relevant to RADBANK's background and requirements. We will discuss Vendor lock-in, dependency on reliable internet connection, data security, compliance with regulations, and performance in accessing data, vendor management as well as Service strategy, Service Design, Service operation and Service Transition.

In case of Resource pooling, since consumers no need to know what the underlying resources are or where they are located, this in turn creates major risk such as **data security, compliance with regulations, and performance in accessing data** which is why location may become highly relevant. (Harding, 2011, p.8). In shared environment, errors or attacks can happen where one tenant can access resources of another tenant. In such an attack, the attacker gets complete access to the data or resources of various customers. (Harding, 2011, p.8). In order to avoid this, providers may give a choice of location, at least to the extent of continent or country, or may say where they operate. (Harding, 2011, p.8). There have to be certain levels of protection effectively built into the application service such as routine back-ups and multi-data center and even multi-country hosting. (Harding, 2011, p.8).

Another challenge of Cloud Computing is **Dependency on reliable internet connection** since **downtime** is a significant challenge of cloud technology. (Harding, 2011, p.34). Also, in a shared environment, whenever the data is transferred between different computers, there is a possibility that the transfer can be intercepted in case of an unreliable internet connection. (Harding, 2011, p.34). To overcome this, dedicated networks and Intranets can be used because companies with an untrusted internet connection will think twice before adopting for cloud computing and also to avoid failures due to internet connectivity. (Harding, 2011, p.34).

Moreover, the most important risk relates to **Vendor lock-in** as it is a major barrier to the adoption of Cloud Computing **due to lack of standardization**. (Harding, 2011, p.34). Vendor lock-in refers to when an organization is constrained due to its overreliance upon a service provided by a single vendor. (Harding, 2011, p.34). It can be overcome by carefully purchasing cloud facilities from multiple service providers and assuring from the start that the services are compatible with other providers along with understanding the requirements from all ends. (Harding, 2011, p.34). It is also necessary to evaluate the vendor's exit terms carefully before signing an agreement. (Harding, 2011, p.34).

Furthermore, **Vendor management** as it requires a different approach since the SLA's are critical. (Harding, 2011, p.34). To overcome this, prioritize the tickets and resolve them as soon as possible. (Harding, 2011, p.34).

The major risks of **Service Strategy** is **difficult to sustain the senior level attention** to the ITSM project and most of the time a senior-level leader **does not fully engage** in project governance, marketing, and communication (Head& Spafford,2017, p.1).and the second challenge and risks are, If the appointed manager is not skilled enough then he won't be able



to hold the team or make them understand about its importance or due to this communication gap would develop, which is not good for the service delivery and if he does not conduct the meeting with the stakeholder to keep them informed about the status of the service development or does not share the obstacles/ issues, then this mistake could result in cost budget overrun and without the proper communication, it might be possible that team won't be able to deliver agreed deliverable and time of delivery might also get extend (Head& Spafford,2017, p.3,p.4, p.5).The various solutions have been proposed to manage such shortcomings. The solutions are “**Engage the business leaders from the start, so that their viewpoints are well-accounted-for, to drive the initiatives to achieve the strategic priorities and goals, senior-level engagement will ensure the proper communication among team, stakeholders & customers** (Head& Spafford,2017, p.2, p.4, p.5). Set up a task force combining business leaders with IT operations leaders and create IT service and process priority lists. If the business leaders and I&O leaders work in sync then the requirement analysis would be coherently generated and the team would get a clear objective (Head& Spafford,2017, p.4). Therefore, the solutions will try to overcome the shortcomings and race to achieve the desired goal.

Furthermore, By implementing the **Service transition** characteristics to RADBANK, there are few risks associated with it **such as project failure, project budget overrun and even the deadline of service delivery gets extended** (Head& Spafford,2017, p.2). **Another major risk is associated with the CMDB**, if it is not properly maintained and keep updated then tracking the error won't be easy and due to which the delivered service would not be efficient and desired one and as of the improper CMDB, we will not be able to assign the skilled resource to the specific problem (Stern, 2020b, p.30). In order to manage the risks various solutions have been presented by *Ian Head & George Spafford's* article, Encourage I&O teams to look beyond the established frameworks such as ITIL. Publicize and reward instances of operations teams collaborating with colleagues in development, architecture, security, and the business. When it comes to accepting the change, the organization must incorporate change management as a central part of its initial and ongoing planning in ITSM (Head& Spafford,2017, p.2).

Moreover, the associated risks with **Service Design** are very imperative because if the requirement analysis or business understanding of RADBANK is not clear to the associates then the ITSM project could fail (Orr, 2012, p.68). The RADBANK I&O workforce would have to build the whole process again because the purpose of the improvements planned to make would not be fulfilled and they might have to face a loss due to rework (Orr, 2012, p.69). This risk might be surpassed by encouraging I&O teams to look beyond the established frameworks such as ITIL. Publicize and reward instances of operations teams collaborating with colleagues in development, architecture, security and the business Head& Spafford,2017, p. 2). Management must incorporate organizational change as a central part of its initial and ongoing planning in ITSM and Ensure that the reasons for ITSM are relevant to the goals and objectives of the organization Head& Spafford,2017, p. 3). Management must define and communicate a vision for service management that establishes why it matters in terms of creating and protecting value relative to organizational goals (Head& Spafford,2017, p. 3).

Another major risk that comes by implementing the **Service Operation** is **tool customization** because initially the associates of RADBANK won't be familiar with tools or techniques So in order to achieve the goal sometimes “Service improvement initiatives can easily become tool implementation projects as for RADBANK the tools would be new and the abilities might not be known, the team can lose sight of the original business goals (Head& Spafford,2017, p. 6). Be wary of heavily customizing an established toolset because customizations tend to corrupt

the designed methodologies of the tools and will add significant cost to upgrades in the mobile application (Head& Spafford,2017, p. 6). In order to manage the risk we would consider The opinion of I&O leaders & experts in her article, which can be considered as a solution to above mentioned challenges Resist the pressure to invest in tools until the maturity of the people (human factors), processes and business management of operations is higher than IT Score Level 2 as well as the appoint the senior - veteran leader so that he would contribute and manage the project efficiently and effectively (Head& Spafford,2017, p. 6).

In this section, we have demonstrated various challenges related to recommendations provided to RADBANK with respect to the characteristics mentioned in the above section which will help us understand the various ways to mitigate those risks involved in achieving better efficiency and effectiveness while managing the outsourcing.

## 11. A ROLE FOR IT GOVERNANCE

The term IT governance comprises of the leadership and organizational structures and processes which **ensures that the enterprise's IT sustains and extends the enterprise's strategies and objectives**" where the term governance means "to steer". (Stern, 2020f, p.6). The Enterprise governance of IT is an integral part of corporate governance which is exercised by the board overseeing the definition and implementation of processes, structures and relational mechanisms in the organization that enables both the business and the IT people to execute their responsibilities and thorough engagement in support of **business/IT alignment** and the **creation of business value** from IT-enabled business investments". (Stern, 2020f, p.6).

The **main goal** of IT governance is to ensure that the **IT function sustains** and extends the **enterprise's strategies and objectives**. (Stern, 2020f, p.9). IT governance consists of IT Strategic Plan Budget/Spend Service Outcomes Organization and Agility Transformation etc. (Stern, 2020f, p.11). The most important thing is that it needs to be **governed well** in order to **enhance the value** for the enterprise. (Stern, 2020f, p.11). If it is not governed poorly, the enterprise will detract from value. (Stern, 2020f, p.11).

In addition to being governed well, RADBANK should have a Board Committee to specifically address technology investment and risk. (Stern, 2020f, p.9). The purpose of the Technology Committee is to assist the Board of Directors in the effective discharge of its responsibilities in relation to technology and related operations who will meet at least four times annually and more frequently if it deems necessary. (Stern, 2020f, p.9).

For over 30 years, the Society of Information Management has found that alignment of IT and the business is the number one concern for both CEOs and CIOs according to the article being published in the CIO Magazine for July 2018. (Stern, 2020f, p.12). The boards need to ensure that the 3 elements are being achieved which includes that their information technology is generating business value, their leadership team is managing IT properly and IT processes and decisions are happening with acceptable risk but they are struggling with all the three elements as stated by Jody Nunn who is the Australian Institute of Company Directors in March 2019. (Stern, 2020f, p.12).

Moreover, there are certain industry standards such as IT Governance Institute, COBIT 5 etc. to ensure that IT is aligned with the business and delivers the business value. (Stern, 2020f, p.14). Apart from this they also ensure whether the performance is measured, its resources are allocated properly and its risks are being mitigated. (Stern, 2020f, p.15).

Therefore, **IT Governance** is **extremely important** because it influences the benefits received from IT investments through a combination of practices (such as redesigned business processes and well-designed governance mechanisms) and appropriately matched IT investments, top-performing enterprises generate superior returns on their IT investments. (Stern, 2020f, p.20).

## 12. CONCLUSION

In this section, after analysing RADBANK's report, we discussed and recommended how outsourcing and ITSM characteristics such as On-Demand Self-Service, Broad Network Access, Resource Pooling, Measured Service and Service strategy, service transition, service operation and service design respectively contribute to RADBANK's areas of improvement. (Stern, 2020e, p.5). These recommendations are based on benefits related to outsourcing and ITSM. Specifically, the Outsourcing recommendation will assist the RADBANK to overcome the mobile and the server capacity challenges by providing benefits such as lower costs by assigning pooled resources, minimal risks due to grouping of cloud resources, maximizing server capacity based on as needed purpose, optimizing market access by increasing the accessibility of their services. (Harding, 2011, p.6). Moreover, the ITSM will address the management problem of RADBANK and it will improve the process and deliver the efficient and effective services by improving the senior-level supervision, better strategic meetings outcomes, by handling the unplanned incidents offering better tools & techniques, better flexibility & cost optimisation respectively. (Orr, 2012, p. 6). These benefits form the basis for our recommendations.

In order to overcome the RADBANK's two major issues such as servers which are unable to meet the growing demands and Mobile App which contains monolithic legacy code as well as management of the planning, transition and operation which is not organised properly, we highly recommend RADBANK to incorporate Outsourcing and ITSM practices because both of these practices will address these issues and will also help in achieving efficiency and effectiveness. (Stern, 2020e, p.5). RADBANK should inculcate Resource Pooling, On Demand Self-Service, Measured Service and Broad Network Access while transitioning to outsourcing. (Harding, 2011, p.4). Firstly, **Resource Pooling** will help in maximizing the use of computing resources of server capacity for RADBANK which in turn will minimize their cost because they can assign pooled resources dynamically. (Harding, 2011, p.6). Secondly, **On Demand Self-Service** will help RADBANK in achieving efficiency by authorizing the users to request the resources on run time based on their utility. (Harding, 2011, p.4). Thirdly, **Measured Service** can scale their server capacity and storage needs as per the requirement. (Harding, 2011, p.11). Lastly, **Broad Network Access** will help RADBANK in maximizing their market access. (Harding, 2011, p.6). Moreover, in order to improvise the management planning and make it more efficient and effective as per the RADBANK's requirement, The RADBANK should utilize the Best practices of ITIL life cycle such as service strategy, service transition, service design and service operation. (Orr, 2012, p. 6). Each recommendation has addressed the specific RADBANK's issues and provided the solutions for the challenges such as **Service strategy** offers various management plans to support the management strategy such as business relationship management, service portfolio management, etc. which in turn will help in delivering optimal services while balancing the cost, risk and time (Head& Spafford, 2017, p. 3, p.4, p.8). Secondly, **service transition** which promotes change management & provides flexibility for betterment (Head& Spafford, 2017, p.2). And **Service design** validates the

strategies which have been approved in service strategy phase & delivers the efficient deliverable as per the SLA (Head& Spafford,2017, p. 4). Lastly **Service Operation** also helps to achieve the effectiveness by incident & problem management as well it offers tools & techniques to the senior-level manager to monitor the process (Stern, 2020b, p.22, p.30)

In the upcoming future RADBANK should focus on Outsourcing as well as ITSM, in outsourcing RADBANK should shortlist the cloud vendors and evaluate the vendor's exit terms carefully before signing an agreement in order to avoid vendor lock-in. (Harding, 2011, p.34). RADBANK should plan the cloud budget and analyse the cost to avoid over budgeting while transitioning to outsourcing. (Harding, 2011, p.34). As well for ITSM, the RADBANK should emphasize more on SLA, senior level leader engagement, flexibility & adaptivity with business transitions, avoid the rigid adherence to conventional practices for the problems etc. in order to avoid the failings of ITSM projects. (Head& Spafford, 2017, p.2, p.3, p.4).

### 13. GLOSSARY

Term	Definition	Source of definition (APA 6 <sup>th</sup> in-text citation)
<b>Best Practices</b>	ITIL represents the learning experiences and thought leadership of the world's best-in-class service providers.	(Orr, 2012, p. 10)
<b>Business relationship management</b>	Service provider and the customers, identifying their needs and ensuring that the provider can meet these needs as they change over time and in different circumstances.	(Stern, 2020a, p.28)
<b>CEO</b>	Chief Executive Officer (CEO) is responsible for managing an organisation.	(Buchanan, 2019, p.1).
<b>CFO</b>	A chief financial officer, a senior executive with responsibility for the capital savings.	(Buchanan, 2019, p.1).
<b>CI</b>	A configuration item (CI) can be anything that is of relevance that needs to be managed in order to provide an IT service, for example hardware, software, people, documentation, processes, contracts. All CIs are recorded in a configuration management data base (CMDB) under change management control.	(Stern,2020b, p.17)
<b>CIO</b>	Chief information officer (CIO) is responsible for managing IT budget.	(Buchanan, 2019, p.1).
<b>Cloud Computing</b>	Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model promotes availability and is composed of five essential characteristics, three service models, and four deployment models.	(Harding, 2011, p.2).
<b>CMDB</b>	A configuration item (CI) can be anything that is of relevance that needs to be managed to provide an IT service, for example, hardware, software, people, documentation, processes, contracts. All CIs are recorded in a configuration management database (CMDB) under change management control.	(Stern, 2020b, p.17)

<b>CMMI</b>	An organisation-wide method to evaluate, measure the maturity of its processes and to generate business value through products or services produced by quality processes.	(Stern, 2020c, p.22)
<b>COBIT 5</b>	Control Objectives for Information and Related Technology is regarded as the de facto standard for an IT governance and control framework.	(Stern, 2020f, p.14)
<b>CSI</b>	It offers a repeatable and effective way to identify and apply an improvement to any aspect of service provision in any part of the service lifecycle.	(Stern, 2020c, p.11)
<b>Deming cycle</b>	Process improvement changes those activities, or the way they are done, to make a process more efficient by reducing the resources required to achieve the desired outcome.	(Stern, 2020c, p.12)
<b>Effectiveness</b>	"making sure that the effort is directed to the desired outcome"	(Stern, 2020d, p.12).
<b>Efficiency</b>	"getting the most output from the least input – i.e. optimization"	(Stern, 2020d, p.12)
<b>Elasticity</b>	It refers to the scaling up and scaling down of Resource usage on an 'as-needed' basis.	(Harding, 2011, p.9).
<b>Financial Management</b>	Managing budgeting, accounting, and charging for IT services, and identify the cost of providing the IT services.	(Stern, 2020a, p.28)
<b>I&amp;O</b>	Infrastructure and Operations	(Headand Spafford, 2017, p. 2).
<b>IAAS</b>	Infrastructure as a Service. The cloud service model in which the capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).	(Harding, 2011, p.4).
<b>Incident management</b>	Deals with unplanned interruptions to service.	(Stern, 2020b, p.28)
<b>Intranet</b>	A local or restricted communications network, especially a private network created using World Wide Web software.	(OUP, 2020a)
<b>IT Governance Institute</b>	Part of the Information Systems Audit and Control Association (ISACA).	(Stern, 2020f, p.14).
<b>IT Outsourcing</b>	"IT Outsourcing is the business practice of hiring a provider outside an organization to provide IT services for IT functions that were previously performed in-house by the organization's own employees."	(Stern, 2020d, p.18).
<b>ITIL</b>	ITIL is one of several frameworks that guide how to implement ITSM.	(Stern, 2020a, p.24)
<b>ITOM</b>	It is integrating IT operations management.	(Bandopadhyay, 2011, p.2)

<b>ITSM</b>	ITSM IT service management a set of related activities that enable an organization to maximize business value from IT. By planning, designing/sourcing, transitioning/integrating, operating, and improving IT services.	(Stern, 2020a, p.24).
<b>KPI</b>	A Key Performance Indicator is a quantifiable measure used to evaluate the success of an organization, employee, etc. in meeting objectives for performance.	(OUP, 2020b)
<b>Multi-tenant</b>	A principle in software architecture where a single instance of a computing resource serves multiple client organizations (the tenants) providing a separate environment for each.	(Harding, 2011, p.6).
<b>Outsourcing</b>	"Outsourcing is the business practice of hiring a provider outside an organization to provide services for functions that were previously performed in-house by the organization's own employees, or new functions."	(Stern, 2020d, p.18).
<b>Problem management</b>	Problem management aims to manage all problems from first identification through to resolution.	(Stern, 2020b, p.31)
<b>QOS</b>	Quality of Service. Outlines the non-functional requirements (e.g., performance) of a resource in a controlled computing environment.	(Harding, 2011, p.6).
<b>Resources</b>	A Resource is a source or supply from which a benefit is produced and that has some utility and worth.	(Harding, 2011, p.5).
<b>Service Portfolio Management</b>	Managing a provider's set of services throughout the lifecycle and approving business cases for investment in IT services.	(Stern, 2020a, p.28)
<b>SKMS</b>	The SKMS is a set of tools and databases that are used to manage knowledge and information.	Stern, 2020b, p.19)
<b>SLA</b>	It is a service level Agreement that mainly contains the quality, risks, costs, and other management plans.	(Stern, 2020a, p.26)
<b>Task Force</b>	A task force combining business leaders with IT operations leaders.	(Bandopadhyay,2011, p.1)
<b>Vendor Neutrality</b>	ITIL service management practices are applicable in any IT organization because they are not based on any particular technology platform or industry type.	(Orr, 2012, p.10)

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## 15. REFLECTIONS

- Joys: It was a great activity. We have learnt a lot after reading all the articles and relating it with the Relevance Map and find the benefits.
- Frustrations: It is really difficult to align the page numbers in case of different page formats
- Learnings: We learnt how to reference an article and how to link benefits with characteristics.
- Comments/questions: Article “Compilation of Research from the last 20 years” have limited pages to read.