

A Model for Classification of IT Services based on Components of Information System

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ABSTRACT

In today's business environment, service is no longer considered peripheral to the business environment; instead, it is increasingly being seen as a core offering to customers. IT systems are becoming important in driving day-to-day business operations. However, businesses are also under mounting pressure to excel at their core work and also in their IT operations. Businesses need the latter to succeed in the former. Due to lack of experience of companies with digital business models, these companies are required to take services from IT organizations and thus IT services are getting more and more importance. Technology has also been playing a central role in the rise of automation of services. The research literature on the IT services w.r.t. business operations, communication, growth etc. is plentiful however, the concept of classification of IT services has not been properly defined. The classification schemes proposed by many organizations are found to be based on the capabilities and resources that exist with the organization. Existing classification fall short of providing a framework that allows for the generalization to accommodate all types of IT services. This paper contributes to a better understanding of types of IT services by summarizing existing categorization and proposing a conceptual model for classification IT services based on components of information system.

Keywords – *IT Services, digital business, classification, information system*

I. INTRODUCTION

Most of people from computer background in academia, the term "services" is understood as Web services or service oriented architectures. However, Information Technology Services not only refer to these services but it also include other services such as software consultancy services, software maintenance and support services, network installation and maintenance services, cloud services, data processing services, disaster management solutions, application development and deployment and many more. Economic activities in most advanced economies are dominated by growth of IT service sector and individual company's success contributes to economic growth of the country. Company's success depends on technical expertise available with them and also on their innovative services and its effective marketing. Large organizations can offer broader range of services to a wider group of customers. These customers could be small organizations or even big corporate customers. Small organizations are also exploring their resources to offer niche services to yet smaller companies, individuals or even partnering with larger companies to get more client base. By outsourcing IT services companies make it easy for other companies to focus on the core capabilities and they need not worry about the technological side of things.

The modern businesses pay more attention towards their customers and data safety. There is a greater demand for services related to data safety, customer support since the businesses want to stay on the cutting edge of software and technology balancing their delicate profit margin. A great way to renew efficiency and streamline business operations and communications is to adopt IT solutions by IT service providing companies. In order to understand the type of service, its scope and boundary and other details, it is necessary to classify them on some basis. The basis of classification found in literature was mostly on the area of company's business or level of implementation or type of processes etc. that does not give a generalised view for classification. Also the reported categorization is too varied and lacks any kind of standardization. Hence a new model for classifying IT services is proposed based on a stable and accepted concept of components of information system.

II. LITERATURE SURVEY

Existence of IT services is inseparable part of daily routine of any company. These services are availed by many departments thro many employees and in many subject fields. Sometimes these are handled by in-house teams or sometimes they are outsourced to facilitate smooth IT operations. Let us quickly define the boundary of services to distinguish them from products. Products are tangible items that

the organizations produce. It includes digital files that are created, modified and stored. Sometimes services are so closely associated with the product that they are difficult to identify separately. Products and services though separate entities and differentiated as tangible and intangible, most of the products have element of service in them. For example, when we buy a laptop, a comprehensive service for a specific period is bundled in addition to tangible product i.e. laptop. Even consulting with a client for advising him appropriate software for his specific need or providing risk assessment in a feasibility study or conducting training for client after software is sold are some examples of the services whose separate existence was unseen earlier. Thus a product is a tangible item that is pushed to market for attention, acquisition and consumption while a service is an intangible item; both are generated by one or more individuals.

A service can exist even before the product is created, during the product is being created and after the product is sold/deployed.

III. CLASSIFICATION OF IT SERVICES

There are many ways in which IT services are classified based on various parameters such as implementation level, types of processes to automate, company's business, types of support services, types of skills employed etc. These types are mostly based on the company's business and activities. Sometimes they are even overlapped. The existing classification basis and proposed classification based on components of Information System is given in figure 1.

Based on types of processes to automate there are three types are found in surveyed literature. These are Workflow automation, Workload automation and IT Process Automation. Workflow automation helps in moving work items e.g. auto escalation, approval processing etc. Workload automation is creating and using software for scheduling, initiating, running and managing tasks related to business processes and transactions. It is often used in virtualized cloud environment [9]. This approach represents a shift from time driven processing to event driven processing. Scheduled job automation such as triggering backup jobs, cleanup activities, moving files, automating on demand workload like provisioning of servers, decommissioning of servers, retrieving orphan storage etc. are examples of workload automation. IT process Automation is the ability to integrate tools, people and processes through workflow [9]. It brings workflow and workload automation together enabling successful IT operations and true automation benefits. All key aspects of IT such as event management, incident management, SLA

management, capacity planning, reporting, dashboarding, service management etc. are included in this approach. It is possible to automate some processes such as runbooks for troubleshooting, data gathering, reporting, patch management activities, self serve options etc.

The definition of IT infrastructure and its scope has changed a lot in recent years. Cloud services and converged infrastructure solutions demand high degree of automation. Some use cases such as elastic infrastructure, on-demand dynamic provisioning, fail-fast scenarios, always-on applications etc. require application stack to be built and also to keep track of infrastructure during modifications or recovery from failures. New practices such as DevOps, NoOps and HybridOps also demands high degree of automation in IT. The classification in such cases is based on the purpose for which it is done whether it is for keeping track of infrastructure or whether for getting self-service deployment solutions or whether for taking out end product i.e. software as quickly and efficiently as possible.

Agile and DevOps are two software development methodologies with the similar aim of getting final output as software as early as possible. DevOps is a practise of development and operations teams collaborating and working together to define a new process of software lifecycle from design to delivery [6]. The purpose of NoOps is to define a process where there is no need of combining development and operations teams for working together. NoOps is a concept to make IT environment so automated that there is no need for dedicated team to manage software in-house.

Some companies have classified specific services based on company's business. E.g. user account provisioning is a business process for creating and managing access to information and other IT resources. So processes related to user accounts such as creating forms to capture all required data, keeping a full audit trail of user account access or routing provisioning requests to the correct approver etc. are grouped under user account provisioning. Similarly other type of services such as creating a single portal to view and manage all pending tasks and notifications fall under managing message notification. Services for creating self-service portals and automatically assign/recycle licenses and hardware resources to different users, creating reports and views on current asset usage, update, scheduling workflows to track firmware/software updates, resource usage and warranty expirations etc. fall under managing and tracking IT assets. Managing helpdesk is also other category of services based on company's business [10].

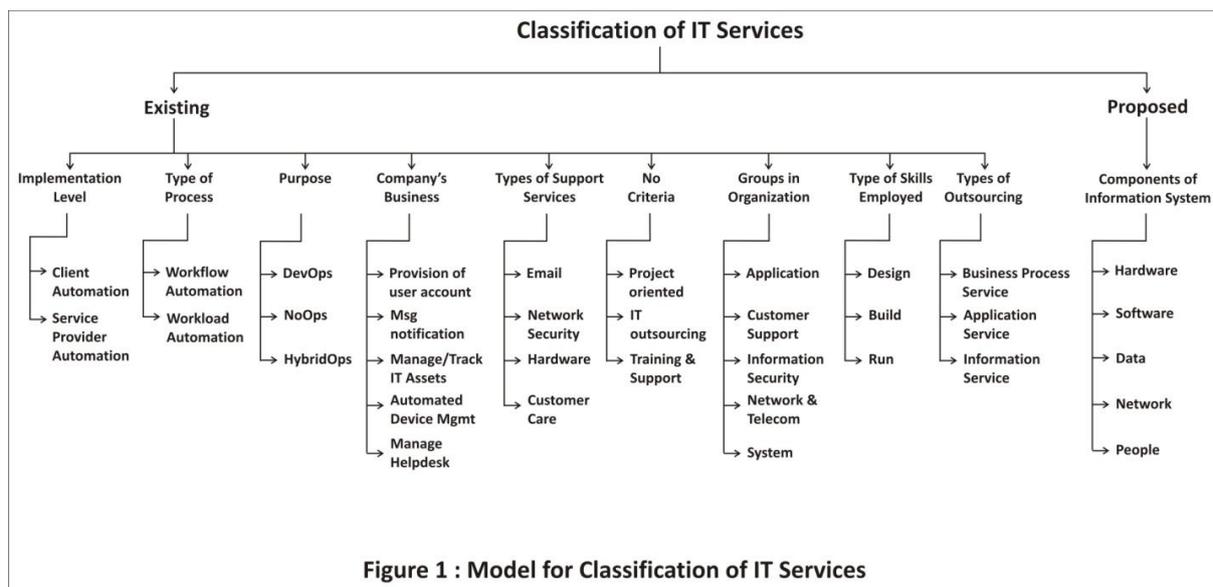


Figure 1 : Model for Classification of IT Services

Based on the types of support services there are four types of IT services offered by outsourcing companies. These are email services, network security services, hardware services and customer care services [11].

1. Email Services – In large companies, hundreds of emails are sent daily by the employees of various departments. The company needs email server or a good email system to handle these emails efficiently. IT services required for setting up and maintaining email system and ensuring that it runs smoothly are classified in this category.

2. Network security – Network setup and its administration are important activities in any organization. Effective networking and connectivity is essential for efficient operations. Network security is also needed so that confidential information can not be accessed by unauthorised people. IT Services related to these activities are classified in this category.

3. Hardware – Any new company usually procures personal computers, laptops, desktops, printers etc. for their employees to start with their work and tasks. If a company does not procure all these devices, it can take IT support services from any outsourcing agency. If outsourced, would come at a lower cost.

4. Customer care – Managing customers is very important task in any business. Customers need their queries to be answered and their problems to be resolved by the company’s executives. Having trustable and reliable customer care increase customer base thereby increase profit and lead to growth of business. IT support services can reduce the time required to resolve customers’ queries.

NASSCOM classified IT services in 3 categories viz. Project oriented services, IT outsourcing services and Training and support services. Project oriented services include IT

consulting, system integration, n/w consulting and integration, software testing services. IT outsourcing services include application mgmt, IS outsourcing, web services and e-commerce whereas Training and Support services include hardware and software deployment and support services and IT education and training services [5].

The classification of such services is done in academic institutes and universities too. Some companies classified services based on groups in the organization. There are five such groups under which IT services are classified. These are applications group, customer support group, information security group, N/w and telecommunications group and systems group [12].

1. The Applications group implements and enhances many critical services for the organization. These services include technical designing, software architecture for application development, support for hosting environment, identity management, role based access to learning management system, authentication services, service provisioning, enhancing web presence etc.

2. The Customer Support Services group provides centralised as well as distributed user support including technical support for service desk. This group supports on-site support for departments and business units.

3. The Information Security Office group offers services for helping customers secure their computing devices, protect information and technology resources.

4. The Networking and Telecommunication group provide services including cabling infrastructure underlying data services, installing firewalls, configuring proxy servers and building security controls.

5. Systems group looks after installation of operating system software, database software, testing and administering run-time application environment and deployment of software on servers. The systems group takes care of essential services of email, messaging, calendaring, printing, file backups etc. It also provides technical expertise for departments, business units.

According to Gartner, IT services refer to the application of business and technical expertise to enable organizations in creation, management and optimization of business processes. The IT service market can be segmented by the type of skills that are employed to deliver the service [1]. These are categorised in three types viz. design, build and run. Accordingly services pertaining to those domains fall in these three categories.

There are three types of IT services based on the type of outsourcing viz. business process service, application service and infrastructure service. When outsourced they are referred to as business process outsourcing, applications outsourcing and infrastructure outsourcing.

IV. PROPOSED CLASSIFICATION

Since the IT services can be availed for any business need and has potential to be used for any application of business, they are ever growing and generated as and when the need arises, and hence they are open ended. The research on literature on the classification of services is too varied and it falls short of providing a framework that allows for the generalization to all types of IT services. Proposed classification is based on fairly stable and accepted concept of components of information system. A new model for classification showing various existing classifications and a proposed classification of IT services is given in figure 1.

An information system is made up of five components viz. hardware, software, database, network and people. All the activities related to a particular component right from consultancy for procuring or outsourcing, procedure for acquisition, initial setup, installation and configuration, training and support and maintenance are categorised as services related to that component. This approach of classification is not dependent on the capabilities, strengths and resources available with a company. It is also independent of the business of the company. Hence it can be very much useful in analyzing category wise expenditure on IT services in a company. Thus IT services are be classified as given below.

A. *Hardware related services*

In this category we consider hardware equipments such as computer systems, laptops, monitors, printers, all other input and devices, as well

as all the hardware parts and accessories required for assembling and maintaining these equipments. IT services related to related to these devices from their existence in a company to their exit are put under this category.

B. *Software related services*

Some examples of software services such as provision of user accounts, message notification, manage/track IT assets, project oriented services, development/ deployment outsourcing services etc. Here we consider professional services for app/software development, integration and consultancy and similar software related services.

C. *Data related services*

Services related to data storage, backups, disaster management, data analytics, databases can be categorised under this group.

D. *Network related services*

Mail services, n/w security services can be categorised under this group. We consider network managing services, network security services under this category.

E. *People related services*

These types of services basically include managing helpdesk. Support services for solving customer queries, run time assistance and other customer care services are considered under this group.

V. CONCLUSION

IT organizations providing IT services play major role in growth and visibility of business. Though IT services are getting more and more importance in planning, operations, communications and other areas of business, existing classification of IT services lack common acceptable basis for classification. A new model is proposed for classification of IT services based on fairly accepted concept of components of Information System; these are hardware, software, data network and people. According to proposed model IT services are classified whether they are hardware related, software related, data related, network related or people related. E.g. Application development, IT outsourcing services will fall into software category whereas all helpdesk and customer care services will fall into people category. The model is independent of type of business and strengths of a company and hence can be applied to classify IT services of any company.

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