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Process Optimization and Automation of Information Technology Services in a Heterogenic Digital Environment

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***Abstract*—**With customers' ever-increasing expectations for fast services provisioning for all their business needs, information technology (IT) organizations, as business partners, have to cope with this demanding environment and deliver their services in the most effective and efficient way. The purpose of this paper is to identify optimization and automation opportunities for the top requested IT services in a heterogenic digital environment and widely spread customer base. In collaboration with systems, processes, and subject matter experts (SMEs), the processes in scope were approached by analyzing four-year related historical data, identifying and surveying stakeholders, modeling the as-is processes, and studying systems integration/automation capabilities. This effort resulted in identifying several pain areas, including standardization, unnecessary customer and IT involvement, manual steps, systems integration, and performance measurement. These pain areas were addressed by standardizing the top five requested IT services, eliminating/automating 43 steps, and utilizing a single platform for end-to-end process execution. In conclusion, the optimization of IT service request processes in a heterogenic digital environment and widely spread customer base is challenging, yet achievable without compromising the service quality and customers' added value. Further studies can focus on measuring the value of the eliminated/automated process steps to quantify the enhancement impact. Moreover, a similar approach can be utilized to optimize other IT service requests, with a focus on business criticality.

***Keywords*—**Automation, customer value, heterogenic, integration, IT services, optimization, processes.

I. Background

THE organization addressed in this paper has a wide geographical spread operation of different natures. IT, as a support entity, adopted a hybrid organizational structure by combining specialized functional towers located in the headquarters area with divisional organization units under the Regional IT Department (RITD), which, with its front liners, is responsible for extending IT support and services to its customers all over the country.

RITD operates and maintains IT infrastructure through a multi-skilled workforce, which is geographically distributed based on its customers' locations. The department provides onsite support for end-user devices, computing and communication infrastructure. RITD utilizes several corporate solutions to manage end-user devices requests, report and resolve incidents, and fulfill customer service requests. This setup was necessary to deliver IT specialized services to its distributed customers efficiently and effectively.

With the ever-increasing customers' expectations for fast services provisioning of all their business needs, IT shifted to a customer centric culture. RITD aligned with this direction and took the initiative to enhance customer experience by optimizing and automating its services delivery processes. The exiting heterogenic environment, evident in the customer geographical spread and the diversity of application-hosting platforms, made it difficult to deliver IT services in a standardized and homogenous manner.

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II. Literature Review

Business process can be defined as "a structured, measured set of activities designed to produce a specific output for a particular customer or market. It implies a strong emphasis on how work is done within an organization." [1] It could also be defined as "the combination of a set of activities within an enterprise with a structure describing their logical order and dependence whose objective is to produce a desired result" [2]. Every company wants to improve the way it does business [3], since continuously improved business processes are a central success factor in today's world [4]. To achieve this, mostly all companies have dedicated business process optimization (BPO) staff and frequently run large-scale optimization projects. BPO efforts ideally include: 1. Data integration: all possibly relevant data needs to be collected and integrated. 2. Data analysis: process model and data need to be analyzed. 3. Detection and implementation of improvements: deficiencies within the process are detected and assessed. Then, appropriate techniques for addressing BPO opportunities are selected and applied to the process or its context [5].

Organizational structure is defined as "a mechanism which links and coordinates individuals within the framework of their roles, authority and power" [6]. It can also be defined as "the formal pattern of how a company groups its organizational activities and functions" [7]. Organizations' operational effectiveness and goals achievement are significantly impacted by their organizational structure [6]. Therefore, selecting and implementing organizational structures for organizations are very critical operations as they may positively or negatively impact the organization's capacity to innovate [8]. In general, organizational structures can be classified into three main types: functional; divisional; and matrix. In many cases, these types are used concurrently,

which results in what is known as hybrid organization [9].

Nowadays, companies need to adopt customer-focused IT, which requires a shift in organizational culture, from considering technical excellence as an end in itself, to respecting customers as the centrally important stakeholder of an organization [10].

III. Methodology

To achieve a noticeable enhancement on customer satisfaction, the team opted to focus on the top existing requested services, which were identified by studying historical data and selecting the most frequently requested services. Also, the team considered future anticipated services, which were highlighted by IT management and derived from the new promising IT trends. The selection was then reviewed and acknowledged by the customer service management entity to proceed with the process enhancements.

To set the expectation of the enhancement effort deliverables, a clear scope was defined and agreed upon with all related stakeholders taking into consideration all potential scope creep sources. This includes assessing technologies, which would result in eliminating the need for device relocation, enhancing the devices demand forecasting process, and establishing a Wi-Fi access point distribution model, which would result in eliminating the need for requesting the service.

Next, four-year historical data from existing services related to customer requests were collected from relevant systems to better understand the processes in scope. The data were then analyzed based on different attributes such as device types, locations, approval duration, processing duration, and customer information. An online questionnaire was distributed to 173 customer liaisons, of which 61 were returned giving a response rate of 35%. The questionnaire aimed to explore customers' opinions related to the selected services. It collected customers' demographic data, awareness of used systems, ease of request tracking, unnecessary involvement of customer liaisons, and duration of service delivery.

Afterwards, a team of business processes SMEs was established to model the as-is processes of the services in scope. This was achieved through conducting several extensive workshops to draft, review and finalize each service related process. A simple modeling technique was used to illustrate events, responsible entities, decisions, and exchanged artifacts. The modeled as-is processes were documented and signed-off by all related SMEs.

After identifying potential steps for elimination or automation, the team developed the to-be processes. Systems SMEs were then approached to evaluate the feasibility of implementing the proposed design. A support model, which included the finalized processes and their RACI charts, was developed and signed-off by all related stakeholders.

IV. Analysis/Findings

A total of 132,745 records of historical data for all existing services requested from RITD were analyzed to define the scope. Applying the Pareto Principle revealed that 86% of the requests were related to two out of 13 services, namely: "Device Relocation" and "New Device" requests, as depicted in Fig. 1. Then, looking closely at the request related to these two services, it was found that 95% of them were related to two device types, namely: "Workstations" and "Printers," as depicted in Fig. 2. Therefore, the following existing processes were included in the scope: new workstation request, new printer request, workstation relocation request, and printer relocation request. Wireless network coverage request (Wi-Fi) was also included in scope by IT management in alignment with the corporate mobility direction.

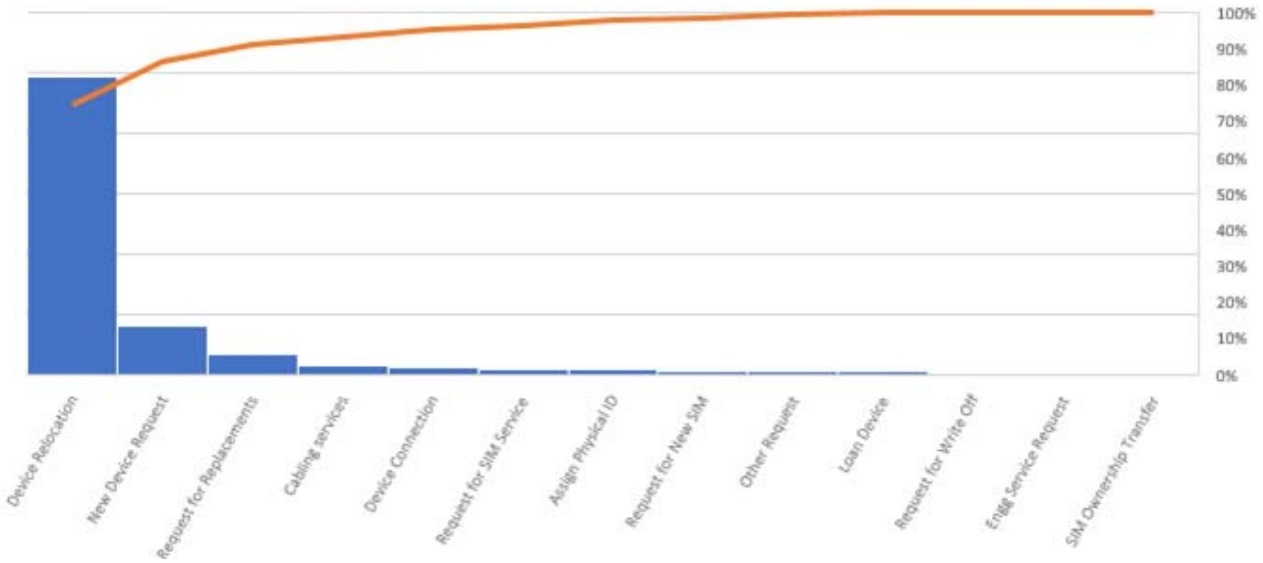

Fig. 1 Historical Data Analysis for Existing Services

Next, more than 42,000 records of four-year historical data related to the four existing services requests were analyzed.

Requested services took, on average, one day to be approved by customers' management and seven days, on average, to be processed by the related regional IT unit. This indicates a need to focus the efforts more on optimizing the core process steps. Furthermore, looking at the source and destination of relocation requests pointed out the different possible flows of the process, which would result in automation and systems integration opportunities.

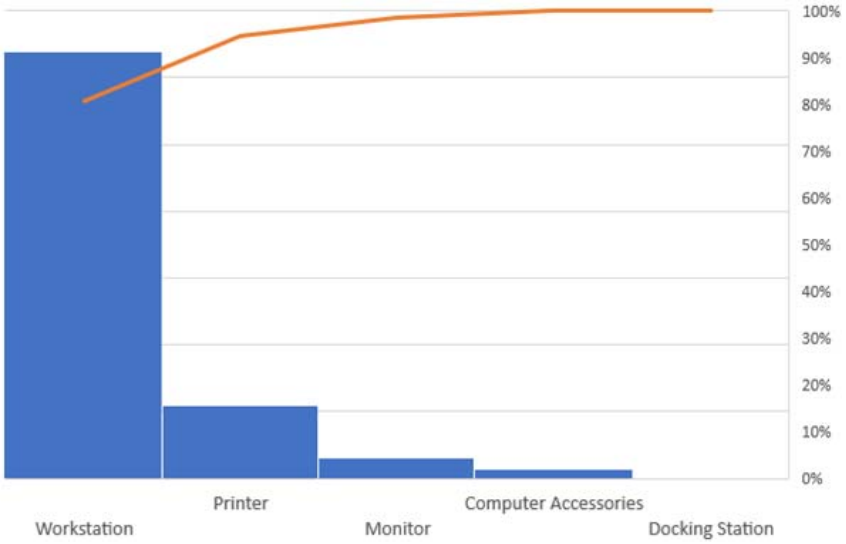

Fig. 2 Top Requested Services Device Types

The questionnaire was completed by 61 respondents supported by all eight department units as shown in Fig. 3.

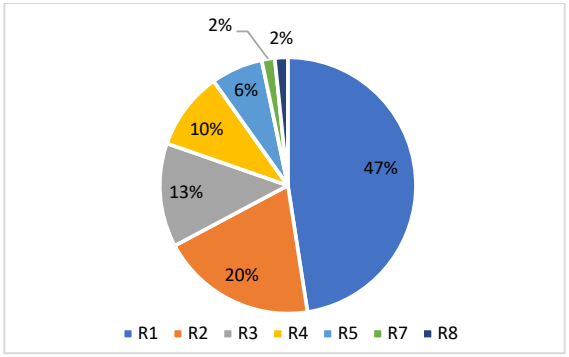

Fig. 3 Survey Results - Support Distribution

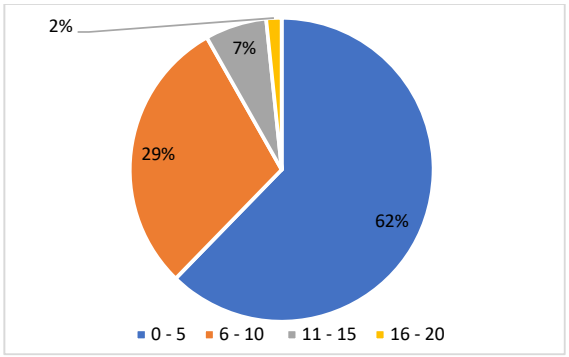

Fig. 4 Survey Results - Customer Liaisons Years of Experience

Respondents had different experience levels in their role as liaisons where 62% had less than 5 years of experience, 29% had between 6 to 10 years of experience, 7% had between 11 to 15 years of experience, and 2% had more than 15 years of experience as illustrated in Fig. 4.

Data collected from the online questionnaire drew attention to several improvement opportunities. As depicted in Fig. 5, 50% of the respondents find their involvement in the addressed processes unnecessary, highlighting potential steps for elimination. The majority of the respondents find it difficult to track service request status, as shown in Fig. 6.

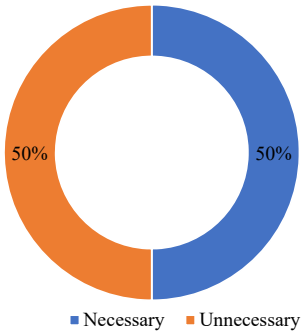

Fig. 5 Survey Results – Liaison Involvement

Material acquisition and installation were found to take more than five working days, as shown in Fig. 7, which exceed the Service Level Agreement (SLA) and affects customer satisfaction.

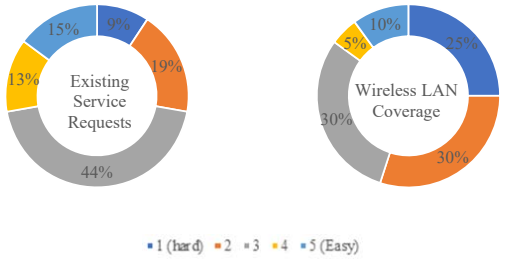

Fig. 6 Survey Results - Ease of Tracking

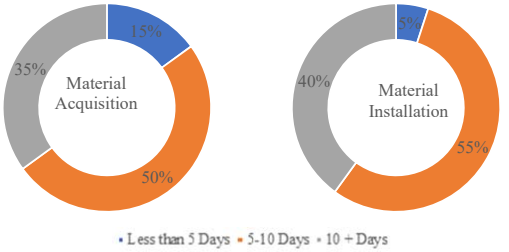

Fig. 7 Survey Results - Material Acquisition & Installation

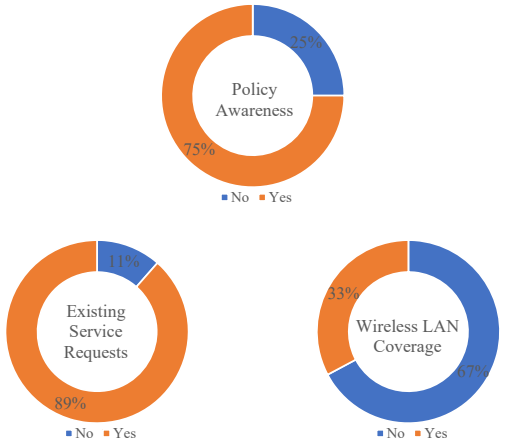

Fig. 8 Survey Results – Awareness Level

Measuring respondents' awareness level of process-related policies showed that 75% are aware of them. The awareness level of the different systems utilized in the processes was high for existing services (89%); however, it was low for wireless network coverage (33%), as illustrated in Fig. 8. Afterwards, the team gained comprehensive understanding of the services in scope after modeling their as-is processes, which showed inconsistency in service delivery to IT customers in different regions. For new workstations and printer requests, demand is initially forecasted in a yearly planning cycle. Throughout the year, customer may submit fulfillment requests, which are first reviewed by a central IT entity to verify compliance with the forecasted devices. Then, the responsible regional IT entity verifies the request compliance with the internal device optimization policy. Once reviewed, the request is sent to an outsourced vendor to be processed. On delivery, the customer needs to create other requests in several systems to configure and start the delivered device.

After completing all delivery steps, the IT warehouse receives the customer signed-off document from the vendor and closes the request in the relevant system without any further verification. For workstations and printer relocation requests, the customer submits device relocation requests in the relevant system, which does not require any business justification. A request is then handled by an outsourced vendor, who needs the customer to create other requests to complete the service. After completing the relocation, the customer is required to sign-off the service delivery form even if the workstation/printer is not yet operational. During the service delivery process, the customer can neither track the original service request status nor provide feedback upon request closure. For wireless network coverage, there is no specific service request; therefore, regional IT entities are utilizing existing irrelevant service requests to receive customer requirement. Throughout the process, the customer is required to create other requests to complete the service delivery.

In summary, several pain areas related to the service requests in scope were identified and used to guide designing the to-be processes. These pain areas include lack of process standardization, unnecessary customer and IT entity involvement, inability to track service requests, and inaccurate performance measurements.

V. Results

The optimization efforts resulted in standardizing the services in scope for all customers supported by regional IT units. The resulted standardized processes took into consideration the different customer natures imposing specific ways of handling certain processes steps.

The to-be processes were optimized by eliminating 23 steps and automating 20 steps. Eliminated steps were related to duplicate requests, unnecessary IT entities involvement and obsolete policies & guidelines. The automated steps were associated with system integration, manual steps and communication between processers.

A single platform for an end-to-end processes execution was selected to implement the to-be processes, which covers the majority of process steps, has high integration capabilities with other systems, and contains built-in features for managing IT performance and perceived customer satisfaction.

To officiate the approach in delivering the services in scope, a support model was developed and signed-off by all related stakeholders. The support model included process maps and their RACI charts specifying stakeholders' roles and responsibilities.

VI. Conclusion

With the ever-increasing technological advancement, IT organizations have to be business partners with a customer-

centric operational model. As a result, IT shall invest more into optimizing its service delivery processes to achieve higher business value. In this paper, several pain areas related to optimizing processes in a heterogenic environment were identified including lack of process standardization, unnecessary customer and IT entity involvement, inability to track services requests, and inaccurate performance measurements. This was approached by collecting relevant adequate data, analyzing it, mapping current processes with business SMEs, identifying potential optimization opportunities, studying their feasibility with system SMEs, modeling the to-be processes, and developing and signing-off the support model.

The effort showed the possibility of achieving an adequate level of process optimization/automation without jeopardizing the service quality and customers' added value. This was accomplished by including all stakeholders in the early stages of the enhancement efforts, studying all processes flows, identifying all used systems, and reviewing their technical integration capabilities.

For further research in this area, several topics are suggested to be discussed such as quantifying the enhancement impact by measuring the value of eliminated/ automated process steps, selecting potential IT processes for optimization based on business criticality, and incorporating practices from popular continuous improvement methods such as Lean and Six-Sigma.

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