Mining IT Job-Order Services: Basis for Policy Formulation & IT Resource Allocation

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Abstract. As the computer hardware have been globally accepted in the areas of industry and education, the IT Job- Order Service Delivery are now becoming very essential part in the resources management. With fast-paced technology development, decision makers require a valid reporting IT resources management [1]. IT resources were expected to be fully maintained to ensure the long-term life span of the computer hardware and devices. Further, having an IT Resource Management System or Software will not be sufficient since maintenance and repairs may probably be a burden to the budget allocation when there is a demand for IT infrastructure development or innovation [2]. Determining the instances of IT Job Order Services, its trends of repairs and services conducted has a significant implication to the decision makers. Using a predictive analytics of the data sets in the IT Job-Order services, could be a basis for revising the policy and IT resource allocation.

Keywords: Predictive analytics · Resource management
Policy improvements

1 Introduction

The prevalence of technology innovation has expanded considerably that brought the management philosophy to become a technology-driven oriented towards the improvement of goods or services [3]. Subsequently, business organization have worked persistently to think of new techniques for interfacing with clients. Key indicator to this procedure has been the improvement of e- ticketing (job-order) process/request. [4] Facilitating ticketing system in IT Job- order services turns to be one of the most important undertakings in dealing with the business operations. Ticket analytics is necessary to distinguish peculiarities to identify uncommon patterns in the operations [5].

Forecasting or conducting predictive analytics may be measured based on analysis of the extracted data taken from the gathered information that can be utilized to anticipate future patterns and conduct new technique designs. An Application Management System (AMS) Analytics framework gives propelled competency analysis on

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learning management, asset administration and allocation of operational resources as well as operational forecast analysis model [6].

Minimizing the personnel efforts in administration of IT service management requires mechanism to expedite the routine maintenance method. There are three (3) research directions that are being recognized or considered to support the IT Service Administration Management: (1) Automatically find out the manifestation of symptoms when facilitating IT Job Service; (2) Logically assess the pattern of events; (3) Identify transient dependencies within the performance statistical data. Furthermore, executions of data framework, could be viably addressed with data-driven result [7].

Generally, the main focus of this study is to predict the best practice processes in implementing the IT Infrastructure Support Services. Specifically, it gears to: (1) identify the frequent request for IT Job-Order Service that was performed to each department, (2) perform predictive analytics on IT Job-Order trends, and (3) recommend appropriate practice in allocating budget in the acquisition of IT equipment and devices.

Moreover, the study is significant to every decision maker of any business organization to formulate and implement policies in allocating IT resources effectively on increasing cost-effectiveness.

2 Related Works

"Application Management Services (AMS)" is a kind of IT outsourcing administration offering that utilizes coordinated procedures, approaches, methodology and norms to deal with the customers' request record. Ordinarily, it provides administration help desk and application support. An application management service has structured and unstructured information. The structured information were classified when specific data were identified. On the other hand, unstructured information is literary depiction of the issue and the documentation of the action taken. The expansive objectives of ticket investigation incorporate with (1) evaluation of ticket operational workload volume; (2) evaluation of ticket action taken from the time AMS we assigned a proof of operational proficiency; (3) proof of potential issues that arise during the service delivery [8].

On the other hand, IT Management Service (ITSM) was considered as one of the IT contribution to customer's business operation. ITSM is also unique in relation to the customer technology-centered methodologies to IT management and business operation. [9]. Moreover, IT Service management process were also known as "Incident Management" [8]. The goal of IM System is to restore the regular service operation as immediate possible subsequently, it guaranteed that those best workable levels of service administration were practiced. [10].

Predictive analytics is defined as part of analysis that focus on the extraction of data from a gathered information that will be used to identify the future patterns and behavioral trends. It is dependent on the connections between variables and from the past predicted variables [4].

In the merchants groups, there is a particular framework the utilize the "ITIL as their thrust: IBM's Process Reference Model for IT (PRM-IT), Hewlett Packard's

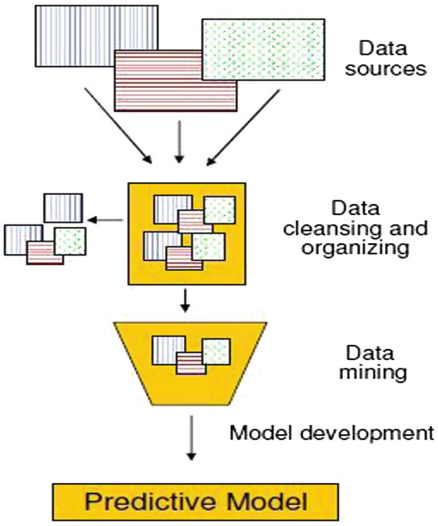

Fig. 1. IBM predictive analytics framework

ITSM Reference Model, and Microsoft's Operating Framework (MOF)." All ofthese frameworks have their own unique approaches to the utilization and execution of ITSM, assisted by an organization for the software proprietary [7] (Fig. 2).

3 Methodology

Investing in IT infrastructure services is highly beneficial and is cost-effective in the long haul [11]. While completely eliminating risk is impossible to achieve, it can help in having increased reliability to significantly reduce risks. To address the purpose of the study in data mining the IT Job-order service, the following methodology were considered:

1. Identify the appropriate tools in data mining the IT Job-Order service. Gather the IT job-order service record for one year.
2. Identify the dataset to be used for predictive analytics
3. Generate a visualize output in terms of:
   a. Hardware category versus request status
   b. Requesting department versus request status
   c. Request status versus hardware category
   d. Frequency of IT service request for department.
4. Identify how IT technical support and services were effectively facilitated through technical support and services.
5. Cluster similar/recurring concerns or problems encountered
6. Cluster the hardware category between old and new units/devices

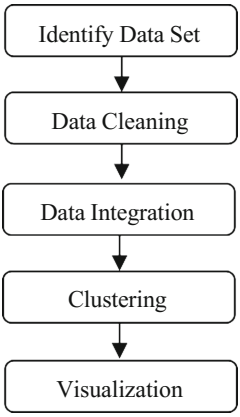

Fig. 2. Mining data of IT job-order service flowchart

The researcher used the Orange Canvas software as tools to facilitate data mining predict analytics on the IT Job-order Services [12]. Orange canvas is an open source machine learning for data visualization. It provides interactive data exploration for a rapid analysis and visualizations of data sets that provided a fast data prototyping and analysis. Further, a data set was gathered based on the one-year IT Job-Order record of the ICT Department. The following data sets that was used for data mining predictive analytics are (1) Department, (2) request, (3) Job Order Number Series (4) Hardware classification (5) request category, (6) problems encountered, (7) Action taken (8) date of Job-order service.

4 Results and Discussions

This section discusses the data mining results based on the different parameters from the visualization analysis tool using the Orange Canvas. The results of the visualization shows the comparison of different entities which relates to the, frequent IT Job-Order service request, Common IT Job-order Service delivered, and identifying the hardware status/condition that are requested for IT services.

Figure 3, Shows that most of the client's IT Job-Order Service requests were referring to the System Units. Result reveals that 60% of the data refers to the request of old unit. In the same vein, the remaining 40% reveals that it is still allocated for the IT Job-order service request of system units that are new. One of the most intrinsic responsibilities of a Management Information System Office is to maintain the quality of the computer services that relates the company's hardware and software assets. It is a must to detect technical issues early, before they become problems. The visualization shows that repairing of old system units is a normal maintenance activity, it is alarming that concurrently, requests for the IT job order service for new system units is almost as high as the result for the maintenance of the old units. This goes to show that the administration should develop a policy on proper handling of computer units to reduce the problems on the increase of new system units maintenance.

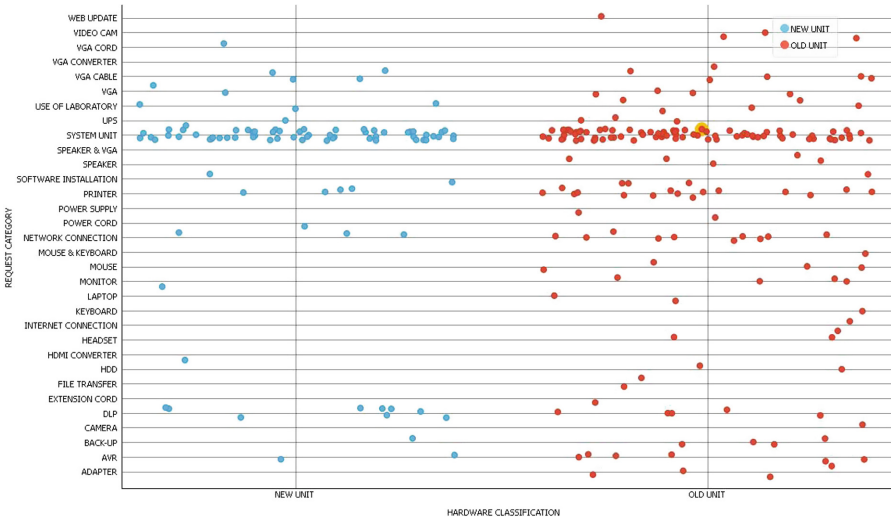

Fig. 3. Graphical representation of the IT job-order service request

Fig. 4. Visualization of the request classification on the IT job-order service request

Figure 4, Shows the request classification of the IT job-order request based on the hardware classification of old and new system units that supports the result of Fig. 1. The data reveals that the top three IT job-order request are technical support (such as troubleshooting and preventive maintenance), borrowing IT peripherals/equipment, and repair (minor and major replacement of computer parts). As related to the hardware classification, the study further reveals that the new system units repairs are also as high as the old system units. Thus, the results compliments to the findings in Fig. 1.

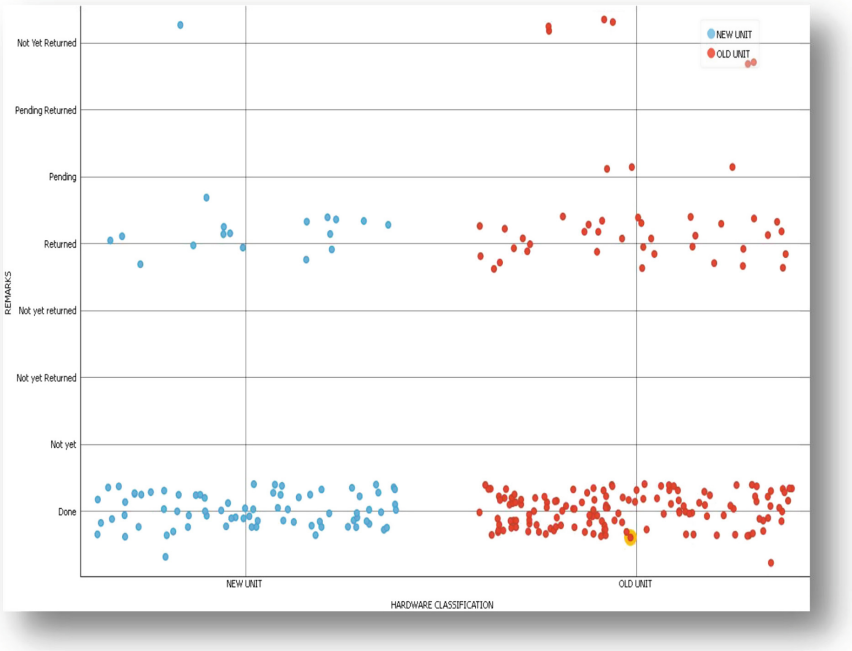

Fig. 5. Graphical illustration of the task status on the IT job-order service request

Figure 5, Illustrates the graphical representation of the task status on the IT job-order service request to the management information system unit of the company. The result demonstrate that the top three (3) job order services were (1) technical support and assistance (2) Borrowing of IT Equipment and (3) Repair. Hence, the outcomes indicate that the issue on repairs and technical support/assistance of the newly acquired units should be assessed and evaluated to appropriately identify the specific brand of equipment and peripherals that should be recommended for future purchases.

Figure 6, Shows the visualization of the IT Job-order Service Request among the different departments inside the organization. The result shows that the acquisition of request is fairly distributed among the departments. Thus, the finding reveals that the policy on IT hardware maintenance should be revisited for update and improvement to provide policy on priority of acquisition of system units and other peripherals.

Fig. 6. Visualization on the IT job-order service request among the department and task status

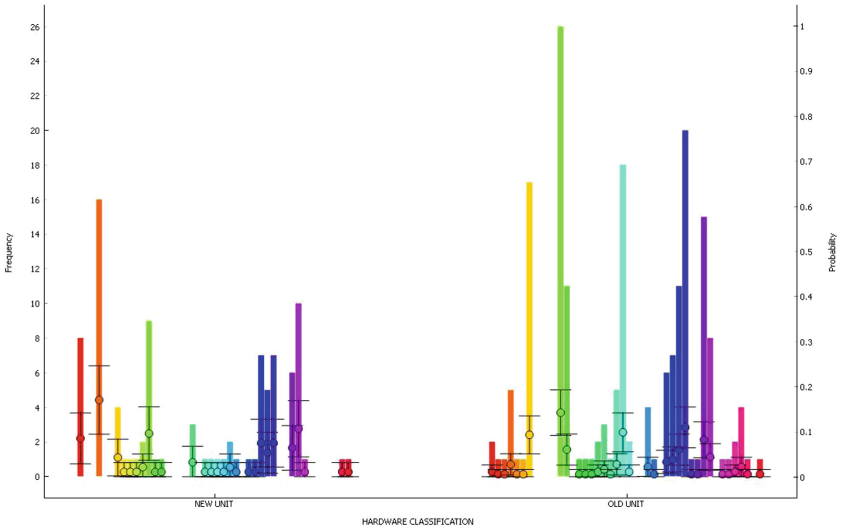

Fig. 7. Visualization of the different entities of the IT job-order service request in the organization

Figure 7, Illustrates the probability and frequency of the IT job-order service request of the department and the hardware classification that were requested for IT job-order service. Further the visualization of the different entities of the IT job-order service request in the organization reveals that the hardware capability in terms of efficiency may have affected the work performance of the employees since majority or almost 30% of IT job-order service request in a month were attended in which however, may lead to the delay of the business operation.

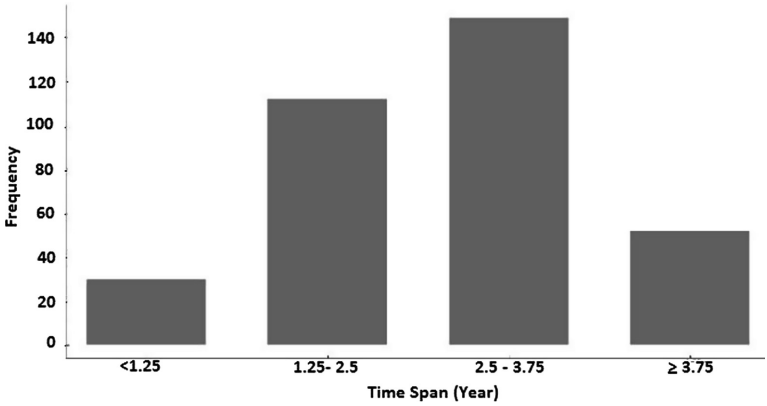

Fig. 8. Visualization on the IT job-order service request among the department and task status

Figure 8, However, proves that from the previous report on the frequency of IT Job-order service request it was very alarming that the life span of the computer units is mostly an average of 2 and half years. The organization could establish an updated policy of IT preventive maintenance and resource allocation to create a systematic approach in the implementation of IT preventive maintenance procedure as it affects the business processes of the organization as a whole.

Figure 9, shows the visualization of the job order service according to month for the year 2017. It shows that peak service months are the months of April, May, June, and November. Top services provided are technical support, website update, repairs, and borrowing of IT equipment. The management should consider adding manpower during the said months as well as ensuring that services staff are capable of performing technical support, and repairs, as well as capability in updating website.

It is noted that the overall frequency results of the IT job-order service graphical representation show that the most common request for technical services was the maintenance of the system units. It is also important that the existing process in conducting preventive maintenance of the computer hardware deployed to each department should be reviewed and studied to create a better solution in technical assistance. Moreover, the cause distribution can be referred to: (1) lack of personnel technical knowledge, (2) the efficiency of the technical manpower conducting hardware assistance, (3) the proper deployment of system units. These three (3) areas of distribution should also be taken for action to contribute in strengthening policy implementation.

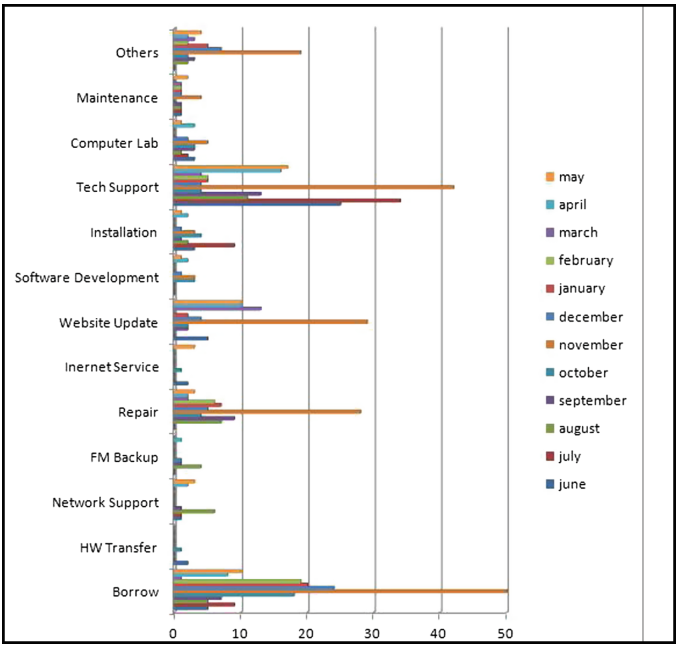

Fig. 9. Visualization of job order service according to month

5 Conclusions

Information Technology in business organization has become an important tool to improve business process. The study deals on the predictive analytics on the IT Job-Order Services. The data reveals that the number of the job-order services request is equally distributed among the departments. However, since maintenance services of new hardware peripherals is as high as the old ones it is also important to check, validate and assess the kind of hardware peripherals and equipment allocated for each department. A need to compare the service level of maintenance outcome between branded and cloned computers should be given a priority. Thus, it is concluded that the organization must establish an updated policy of IT preventive maintenance and resource allocation to create a systematic approach in the implementation of IT preventive maintenance procedure as it affects the business processes of the organization as a whole.

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