DEFINITION AND IMPLEMENTATION OF PROCEDURES FOR IT ASSETS MANAGING

Jaumin Ajdari[1], Ahmed Abdullai[2], Xhemal Zenuni[3], Bujar Raufi[4], Florie Ismaili[5]

[1]South East European University, Tetovo, Macedonia. j.ajdari@seeu.edu.mk
[2] South East European University, Tetovo, Macedonia. a.abdullai@seeu.edu.mk
[3] South East European University, Tetovo, Macedonia. xh.zenuni@seeu.edu.mk
[4] South East European University, Tetovo, Macedonia. b.raufi@seeu.edu.mk
[5] South East European University, Tetovo, MAcedonia. f.ismaili@seeu.edu.mk

ABSTRACT

Purpose - Manually tracking and management of thousands of IT assets in a company is costly, takes significant time, and has a tendency for mistakes.
Methodology - In order to reduce costs while planning the budget, companies require a solution to manage the hardware, software, and information throughout the life cycle of the IT assets, to maintain control, increase accountability and to support strategic decision-making.
Findings - The main purpose of this study is to analyze and develop a IT asset management solution and to help the companies to store information about the assets, locations, owners and costs.
Conclusion - The success of the ITAM system is measured by savings and by the prevention of the risk. ITAM system helps in budget planning, cost optimization especialy IT cost optimization, decision-making, process improving, etc.

Keywords: ITAM, ITIL, LCAM, RFID, HelpDesk.
JEL Codes: M15, O32, Q55

1. INTRODUCTION AND LITERATURE REVIEW

Information is the most important strategic resource by which every organization should operate. The quality of IT services is the key to the collection, analysis, production and dissemination of information within an organization. IT asset management (ITAM) is a set of business practices that brings together financial, contractual and inventory functions to support strategic decision-making for the IT environments. Managing IT assets is an important part in the strategy of an organization. Usually it involves collecting detailed information for inventory, which is used to decide on the purchase and redistribution of hardware and software. Managing IT assets helps institutions to manage their systems more efficiently by reducing in time and financial costs, by avoiding unnecessary purchases of assets and promoting the use of existing resources. Institutions that implement an effective ITAM system minimize risks and costs of the projects for the upgrade of the IT infrastructure that are based on outdated information, incomplete and less correct. In this regard most institutions and authors refer ITIL's practices as a basis when defining the administrative processes (Ahmad & Shamsudin, 2013), (Tanovic & Orucevic, 2012), (Al Mourad & Johari, Resolution of Challenges That Are Facing Organizations before ITIL Implementation, 2014), (Al Mourad & Hussain, The Impact of Cloud Computing on ITIL Service Strategy Processes, 2014), (Verlaine, Jureta, & Faulkner, 2015), (Gil-Gómez & Oltra-Badenes, 2014), (Tanovic, Androulidakis, & Orucevic, 2012).

The need for tracking and monitoring IT assets appears as a result of the various problems related to IT assets management. The organizations, in general are characterized with the absence of the processes and the adequate systems to track and manage assets. The organization has no information about the assets, where are allocated and who is using them. Unused hardware assets often kept in the warehouse without any mechanism of control and without any employees responsible for them. Different administrators have access to inventory and can make changes without recording any information about the change. There is also the lack of discipline of operational management, which is responsible, to deal with the tracking of the assets which are neither present nor documented.

In November 2001 Gartner published the first iterative version of the IT asset management (ITAM) based on capability maturity model (CMM). In the next three and half years, many of companies started with use of ITAM and have moved up the maturity level. Researchers indicates that it takes approximately 18 months of dedicated effort to align all people, processes and tools to facilitate moving from one level to another level (acording to Gartner). It has taken many years of process maturity and redesign, but ITAM programs, now are widely accepted by senior IT management as a core management discipline. As a result, fewer implementations are chaotic, and the number of companies achieving active management has increased. Also as organization (company) information system is evolved from level to level, each step will yield incremental savings and value, resulting in lowered costs and decreased risk. Today, many companies are recognizing that contract negotiation is an early stage of the asset life cycle, and ITAM enables efficient negotiation by providing data to assist with assessing vendor performance. However, most companies do not wish to displace their purchasing systems, so the ITAM database is used rather as a supplement (Adams, Update to the IT Asset Management Maturity Model, 2005). In fact, 50 to 80 percent of enterprises have yet to implement ITAM repository technology. A part of those who have implementation, a very few of them have integrated ITAM to their IT Service Management technology. Despite the significant financial and productivity benefits, according to Gartner's estimations, only 33% of IT organizations integrate their IT service desk tools with their ITAM repositories - even if both tools are from the same vendor (White Paper, The Benefits of Combined IT Service Management and IT Asset Management, 2010). Hawlett Packard believes that asset management is an evolutionary process (White Paper, Understand how IT asset management works for you, 2012). An organization cannot achieve the highest level of maturity until a number of processes are created, tested, and implemented. Adopting a planned and phased approach to ITAM best improvement practice can make the transition more predictable and help optimize the outcome. According to Gartner, IDC and KPMG we have the following statistics:

- 70% of organizations have a 30% discrepancy between planned inventory and actual inventory.

- Up to 30% of an IT budget could be saved by effective asset management.

- Organizations that practice ITAM had 15% or lower TCO. Greatest savings were in procurement, disposal, and operations.

- Enterprises that reconcile assets can identify redundant or rarely used products. An enterprise saved a huge amount of money by dropping a product for which it was paying maintenance fees but no longer use.

- By retiring unused assets, companies may reduce tax bills for assets by as much as 20–30%.

These statistics suggest that organizations by implementing ITAM can save money and ensure compliance, and without implementation, more often, they waste money and also are in noncompliance risk (Adams, Five Ways to Save Money and Reduce Risk With Your IT Asset Management Tools, 2014).

The paper is structured as follows. On the second section, Life Cycle, is presented the methodology used by organizations for IT assets management, where is analyzed the integration of the business processes, practices and controls with the aim to represent best value. The third section, Implementation, in which is presented the way of the project implementation. In this section are described nonfunctional and functional requirements, database design as well as the used software technologies. And the last section, Conclusions, where are given some conclusions, achievements and future directions.

2. LIFE CYCLE

Lifecycle Asset Management (LCAM) is the methodology used by organizations for IT assets management. IT asset life cycle management is the integrated set of business processes, practices and controls that ensure that decisions are financially prudent and represent best value. The stages of the IT asset life cycle include identification of business needs, purchase of IT assets required, deployment, use and maintenance of IT assets and, finally, their disposal. Effective life cycle management should minimize business disruptions and support strategic decision making for the IT environment (Agency Canadian International Development, 2010). Companies should adopt a comprehensive approach that addresses the IT tools and support resources, business processes, data and vital technologies in order to ensure effective management tools and strategic decision making. To achieve operational excellence, it is of extreme necessity to incorporate asset management into daily business routines, by enabling this holistic approach and managing effectively asset data. To

support LCAM, four fundamental elements must be taken into consideration: management strategy, optimum organizational design, long term asset planning and risk management. Before deploying an ITAM solution, to discuss and define the various stages its hardware assets, it is a helpful practice to an organization. The organization shouls start with answering to some elementary and simple questions such as: How are they purchased?, How are they used?, How to decommission and dispose them?, etc., and when it has the answeres and has identified the various stages and processes associated with their life cycle then it can start with solution implementation (Hawlett Packard White Paper, 2011). The following diagram shows an example of the different phases of the asset life cycle:

Figure 1: Asset Life Cycle Phases
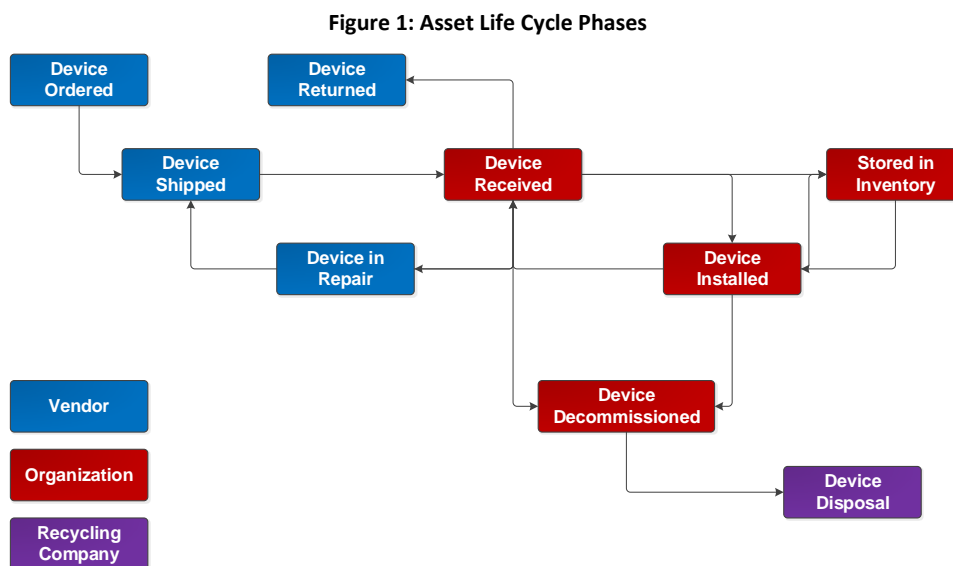
In most cases a device or asset starts as being on order or procured and then moves through the various lifecycle stages shown above until the asset is eventually disposed of or decommissioned. The difference in the color indicates which organization has physical possession of the asset within each stage. The arrows between lifecycles are the business processes that should consider to ensure that the asset database is properly updated as the result of assets change status. The above example is only one of the many examples of how an asset lifecycle diagram may look.

Typically, a hardware refresh cycle occurs every 18 months. Depending on data center size the quantity of assets that may be swapped or purchased can be enormous and keeping an accurate inventory of the newly procured hardware assets and disposed assets can be a challenge. IT asset management system gives management and ability to administrators, in an easy way, to search and obtain financial and purchasing information about a particular equipment and model or groups of equipment manufacturers. Retrieving this information can be useful when planning hardware purchases. ITAM not only tracks and manages assets that are in use and plugged in but alse copes with those that are off-network. These assets are usable assets in a stock location or in inventory. Before purchasing a new hardware, the responsible coordinators can search ITAM databse for assets in inventory and determine about available assets which fulfill the new equipment requests. The ability to track assets that are in inventory ensures the purchas only necessery equipment.

Managing deployed assets is in the core of ITAM capability. The entire change management process can be managed from the system. Enabling access from any web-enabled device, users can easily record moves, adds and changes. Effectively logging and recording asset history during the change management process, ensures that asset repository is kept up to date and populated with accurate device information. Retired or decommissioned assets can also be managed in ITAM. These are assets that are no longer of used but have not yet been properly disposed of or destroyed. An accurate history of these devices must be kept for compliance and audit purposes. In some cases, these assets may be retained for a certain time, to keep secure the sensitive data, until the new asset is established for secure use. In most cases retired assets must be properly disposed of before they are taken off from the books. Compliance requires that a disposed of asset is the one that has been officially wiped of data, transferred to a disposal company and the disposal company has provided an official certificate of disposal ensuring that the asset has been properly disposed of. ITAM provides a secure and accurate repository to store all disposed documentation and accurate history of the equipment throughout its entire life cycle, they can be used for reports and other purposes. Failing to IT assets manage across all their lifecycle – from acquisition to their

disposed of – proves that it is costly for businesses, puts them at risk legally, and blinds the businesses to new opportunities. The reasons why include:

- Purchasing new hardware and software is not necessary when there are existing assets available for redeployment.

- Untracked assets are lost, because the responsible employees, have left them without being required any account for them.

- The company pays lease and support contracts for assets that are no longer in service.

- The company pays excessive taxes because retired assets are still on the books.

Weak disposal procedures and documentation triggers regulatory fines and penalties.

3. IMPLEMENTATION

Building a secure distributed web application is challenging. Within distributed application, it has a lot of moving parts and making those parts to work together, in a secure fashion requires a working knowledge that spans to products and technologies. There are a lot of thing that should be considered; integrating various technologies, being current with technology, and keep a step ahead of the competition. Designing a distributed application involves making decisions about its logical and physical architecture, the technologies and infrastructure used to implement its functionality. To put these effectively decisions, in a proper way, it is obviously to have a sound understanding to the business processes what the application will performs (its functional requirements), and the levels of scalability, availability, security, and maintainability required (its non functional, or operational, requirements).

3.1. Nonfunctional Specification

The company information system is implemented with the aim to create a contemporary information system by increasing the quality of service, transparency and privacy of the employees. The implemented computer system supports a multilayer architecture. There is a balance of functions in each of these layers. Flexibility and modularity are important. The built system is able to accommodate the changes, improvements, the new technologies and to minimize the impact of maintenance cost in the future. The system is able to accommodate an additional new functionality in order to meet new business practices, or to change existing practices. The system is simple to use and maintain. It is built to be used by a large number of users through the use of technologies that minimize the need for end user training. The system integrates simple procedures for routine system maintenance, monitoring and update. The development of a strategy for authentication and authorization on the distributed web applications is a challenging task. The development of a proper authentication and authorization during the early stages of application development helps in the elimination of many potential security risks. Thus, the system provides a good security techniques and easy to administer. The information that support decision-making, are accessible only for the authorized users, and responsible users and statistical specialists can find answers for their complex questions.
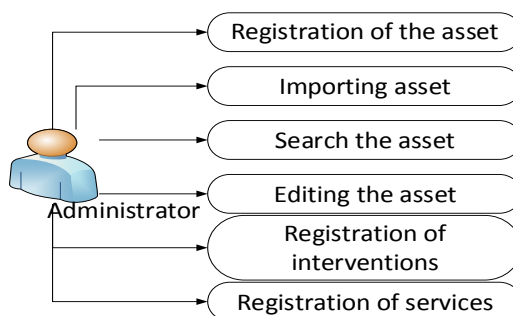
3.2. Functional Specification

In order to achieve the high satisfaction, to integrate the better opportunities, to give the better features, during the ITAM development phase, we have analyzed some similar products existing on the market and we have implemented some of the finding important features in our solution. Also, to take a scientific and technological support we analysed some scientific papers (Zhu, Song, & Song, 2009), (Hintsch & Turowski, 2013), (Shrestha, Cater-Steel, Tan, & Toleman, 2012). The important thing was that the system needs to be adapted to the specific conditions and circumstances of the organization for which the system is developed. ITAM has a few different actors, one of the actor is administrator. The dedicated functionalities of the administrator as an actor in this system are: Registration of the asset, Impor the asset, Search the asset, Edit the asset, Registration of interventions and Registration of services. Functionalities listed above are presented visually with the help of the diagram in figure 2.

3.3. Database Design

Designing a database is one of the most important parts in the development of applications. The database is the core logical structure that should identify and solve the structure problems and data storage, and also define the majority of the system logic. In our case the relational database model is used. Because the application is developed under Microsoft technologies, MSSQL Server as a system for database management is used. The required entities are defined as a result of analysis of the system activities and functionalities.

Figure 2: Functionals Diagram

- Registration of the asset
- Importing asset
- Search the asset
- Editing the asset
- Registration of interventions
- Registration of services

Administrator

3.4. Used Technologies

To build strong, robust system and flexible system extend, its very important to research and define the technology platform. To create a list of technologies that can be easily together integrate in accordance of achieving the main goal and building an end-user software application. Technologies identified as potentially the best choice for our environment are: .NET Framework 4.6, ASP.NET 5.0 (the application is developed with ASP.NET 5.0 WebForms), C # 6.0 (the programming language in which the code is written) and IIS 7.5 Web Server. Technologies that are used in development of the interface are: HTML, CSS, XML, ASP.NET Master Pages, AP.NET Styles, JavaScript, jQuery and JQuery UI Framework.

4. CONCLUSION

Management of technological equipment in an organization has never been more important than nowadays. Presentation of frequent changes makes it mandatory that every IT manager to track the IT assets of the organization in which it operates. Managing of the IT assets should not be seen only as something that "would have been nice to have", but for every institution obviously is something that "must have" for numerous reasons. So it is in the interests of any organization whether to take any steps towards the implementation of a ITAM solution.

The determination and identification of costs is a vital and integral part of the asset management process. In the past, comparison between asset alternatives was based mainly upon initial capital costs. However, asset service life consumes more resources and this must be taken into account as a cost on the ongoing operating and maintenance costs. Both initial capital costs and ongoing operating and maintenance costs must be used when performing decision-making. In summary, Life Cycle Costing (LCC) of an asset can be defined as "the total cost throughout its life including planning, design, acquisition, installation, operation, maintenance, refurbishment, disposal and support costs and any other costs directly attributable to owning or using the asset". The cost of the life cycle is a widely used methodology. In the IT asset management, it is important to determine the cots of the asset throughout their life cycle. Many different worldwide organizations that deal with research of information technology supports the fact that the implementation of a system of this nature is not just to organize the assets but it is financial very important for an organization because it reduces the costs of the organization incomes up to 30% starting from the first year of implementation.

Preparation of reports and obtaining results undoubtedly helps directly in decision-making, thus we obtain a clear view about how the assets have reacted in the past, which supports the hypothesis concerning the improvement of the strategic decision – making as a result of the implementation of the ITAM system.

The success of the ITAM system is not measured only by savings but also by the prevention of the risks which can only be achieved if stakeholders across the business commit itself to:

Plan the budget, to optimize life cycle costs of assets and to destine the expenses to acquisitions or innovation strategy;

Protect the high decision makers from ill-informed decisions on investments by engaging them to prove life cycle costs;

Protect the IT budget against software license audits while maintaining compliance;

Satisfy the business needs by investing not only in equipment but also in people and improving processes.

IT buyers need to know more about existing assets, the life cycles and competitive alternatives to new assets when they are negotiating to buy. Gartner recommends (Bona, 2013) that CEOs and their IT leadership teams need to follow five major organizing principles to create and sustain a cycle for continuous improvement: Strategize and Plan, Develop Governance, Drive Change Management, Execute and Measure and Improve.

Under the guidance of the above instructions, we can draw the conclusion that every successful project starts with the

people, processes and technology. When the system affects every part of the business, we need a leader which will harmonize people, processes and technology together in a working environment. To be successful, it is important to have a common database as a real single source, where are registered all activities happens during the asset life cycle. This will help in generating necessary reports that will provide a clear picture of the condition of the assets. Improvements should continue, so that the level of maturity to lift up on at the highest possible level. During the journey we need to move in compliance with the organization policies. For smart managers, the evolution of the ITAM system should be seen as an exciting opportunity for improvement. A healthy and pragmatic approach is needed to find the optimal practices. Finally, success comes when the strategy turns into action.

REFERENCES

Adams, P. (2005). Update to the IT Asset Management Maturity Model. Gartner.

Adams, P. (2014). Five Ways to Save Money and Reduce Risk With Your IT Asset Management Tools. Gartner.

Agency Canadian International Development. (2010). Information Technology Asset Lifecycle Management. Canadian International Development Agency.

Ahmad, N., & Shamsudin, Z. M. (2013). Systematic Approach to Successful Implementation of ITIL. Information Technology and Quantitative Management (pp. 237-244). Suzhou, China, 2013: ELSEVIER, Procedia Computer Science 17 (2013).

Adams, P. (2005). Update to the IT Asset Management Maturity Model. Gartner.

Adams, P. (2014). Five Ways to Save Money and Reduce Risk With Your IT Asset Management Tools. Gartner.

Agency Canadian International Development. (2010). Information Technology Asset Lifecycle Management. Canadian International Development Agency.

Ahmad, N., & Shamsudin, Z. M. (2013). Systematic Approach to Successful Implementation of ITIL. Information Technology and Quantitative Management (pp. 237-244). Suzhou, China, 2013: ELSEVIER, Procedia Computer Science 17 (2013).

Al Mourad, M. B., & Hussain, M. (2014). The Impact of Cloud Computing on ITIL Service Strategy Processes. International Journal of Computer Computing on ITIL Service Strategy Processes, 367-371.

Al Mourad, M. B., & Johari, R. (2014). Resolution of Challenges That Are Facing Organizations before ITIL Implementation. International Journal of Future Computer and Communication, 210-215.

Bona, A. (2013). ITAM Key Initiative Overview. Gartner.

Gil-Gómez, H., & Oltra-Badenes, R. (2014). Service quality management based on the application of the ITIL standard. DYNA 81 (186), (pp. 51-56). Medellín.

Hawlett Packard White Paper. (2011). Lifecycle asset tracking. Hawlett Packard.

Hintsch, J., & Turowski, K. (2013). Towards Implementing IT Service Management in an ERP for the IT Service Industry. Working Conference on the Practice of Enterprise Modeling, (pp. 83-95). Riga.

Shrestha, A., Cater-Steel, A., Tan, W.-G., & Toleman, M. (2012). A model to select processes for ITSM improvement. Australasian Conference on Information Systems, (pp. 1-10). Geelong.

Tanovic, A., & Orucevic, F. (2012). Proposal of a new model for ITIL framework based on comparison with ISO/IEC 20000 standard. WSEAS TRANSACTIONS on SYSTEMS, 11(9), 489-505.

Tanovic, A., Androulidakis, I., & Orucevic, F. (2012). Advantages of the new ITIL V3 model in the implementation of the IMS system. Recent Researches in Communications, Information Science and Education, 183-191.

Verlaine, B., Jureta, I. J., & Faulkner, S. (2015). Aligning a Service Provisioning Model of a Service-Oriented System with the ITIL v.3. International Conference on Exploring Service Science 1.5 (IESS 2015), (pp. 1-34). Porto.

White Paper. (2010). The Benefits of Combined IT Service Management and IT Asset Management. Quebec: Provance Technologies: Quebec: Provance Technologies.

White Paper. (2012). Understand how IT asset management works for you. Hawlett Packard.

Zhu, L., Song, M., & Song, J. (2009). ITIL-based IT Service Management Applied in Telecom Business Operation and Maintenance System. Proceedings of the Second Symposium International Computer Science and Computational Technology (pp. 243-246). Huangshan, China: International Computer Science and Computational Technology.