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Development of an IT Asset Management Tool for Enterprise Information System

S. Hazra, *Assistant Professor, NSHM Knowledge Campus*, P. Roy, *Research Fellow, Jadavpur University*
soma.hazra.frnd@gmail.com

***Abstract*— Every organization has several types of valuable components called asset to serve many services. But, this huge amount of asset cannot be easily maintained by any person manually, because it has become more time consuming and also costly for any organization. IT asset management represents an important role for asset maintenance. For the proper asset maintenance, each and every organization should have some appropriate mechanism. In this paper, an Asset Management tool is introduced. This tool successfully monitored and manages all types of asset of the organization following the asset life cycle and inventory functions to manage huge asset of an organization. It also describes the main issues arising from several aspects such as add, repair, and disposal of assets.**

***Keywords*— asset; asset management; asset inventory; asset li fe cycle**

I. INTRODUCTION

For many years the security industry believed that the best way to protect an enterprise was to contain its data within the perimeter, build the wall to keep the bad things out. But now, security has changed significantly. New security challenges have been introduced as enterprises extend their networks and data to other parties. To achieve a predefined goal, enterprises contain some asset. Assets can be evaluated in many ways like financial asset (e.g. Investment asset, Global asset), Physical asset (e.g. water, power etc.), fixed asset (e.g. land, building), IT asset (e.g. Hardware, Software, network etc.), Human Resource (e.g. manager, project leader etc.) etc. According to ISO – IEC 27002:2005 International standard, 2005 and ISO – IEC 27005:2008 International standard, 2008, IT asset is categorized in four ways. These are hardware asset, software asset, network asset and information asset and Asset Management Tool is designed to manage all these IT assets of the organization for better assistance.

II. TERMS AND DEFINITIONS

Asset:

Asset can be defined as anything which has value to an enterprise. It can be furniture, documentation, hardware, software etc.

Asset Management:

Asset Management means the comprehensive management of asset demand, planning, procurement, operation, maintenance, rehabilitation, disposal and replacement. It is used to maximize the return on investment at the required standard of service to current and future generations.

Asset Inventory:

Asset inventory is the process for managing and maintaining the huge amount of assets.

Asset Life Cycle:

Asset life cycle illustrates the phases of an asset from its initial to the disposal.

III. RELATED WORK

To manage all the asset of any organization, some management tools are generally needed. Some tools have already been developed and available in the market for asset management services. Asset Explorer software discovers and monitors all hardware and software asset from one place. It ensures the software license compliance. It follows the asset life cycle and maximizes the benefit of asset [10]. Sys Aid Asset Management Software views the details of hardware, software and network asset. It can remotely control the devices on the network. It creates the inventory reports of the asset [11]. Asset Manager- Quest Software (DELL) manages hardware and software asset. It also generates usage report and track usage through metering. So, it quickly identifies the non-licensed software and the software which is sitting idle [12].

But this proposed asset management tool can independently monitor and manages the hardware, software, network and information assets. Not only single asset details, but multiple assets details can also be entered at a time by this tool. It stores the asset information with all its vital information like licensed information, owner name, activity status, critical level etc. It can remotely control the asset of a network. The tool also can generate asset inventory reports based on user given criteria. It can generate the report of all categories of asset and also show the inventory report based on the asset criticality

level. On the other way, the best part of this tool is, it can be used as add on services with any running software services.

Thus, it can be considered that this newly introduced asset management tool acts upon a major amount of assets of any organization and efficiently manages the asset with some standard facilities

IV. RELATIONSHIP BETWEEN ASSETS

Any organization has different types of assets. It has become more time consuming and also costly for any organization to maintain this huge amount of asset manually. The purpose of this asset management service is to generate a system where the values of an entity or group are monitored, maintained, upgrade and also disposed in a systematic cost effective way. Basically using this asset management tool, IT asset can be identified in four categories. These are hardware asset, software asset, network asset and information asset. It has the objective to provide the best possible service to the user.

Hardware Asset mainly means the physical elements of the supporting processes. It may be several kinds of equipment. Such as data processing equipment, transport equipment, fixed equipment, processing equipment, data medium, electronic medium, other medium. Software asset consists of the programs used to do some operation of a data processing set. It can also be classified in many ways like Operating System, Service, maintenance or administration software, Package software or standard software. The combination of hardware and software asset resource gives a proper service to the system. Software asset provides a set of instruction that tells the hardware asset what to do and how to perform the request action. So, hardware asset and software assets are complimentary to each other.

Network asset consists of all communication devices like bridge, router, Wireless Access Point, transceivers, LAN Adapter, ISDN terminal adapters, dongle etc. These devices are used to interconnect several remote computers or some other elements of an information system. Using network assets, many hardware assets can be interconnected. So, remote hardware assets can communicate to each other using network assets. Information asset is required to achieve the final objective determined by the organization. It determines the direction and development needed in order to benefit. Information can be classified in many ways like personal information, strategic information, and high-cost information To perform certain tasks, hardware, software and network assets are using some information assets and also generating some valuable information assets after using the hardware, software and network assets. So, these four types of It assets are interrelated to each other.

V. ASSET LIFE CYCLE

The primary goals of an organization are to increase profits and decreasing the manufacturing cost. These profits or losses are depending on the assets of the organization. So, the management of these assets is also an important task. Through asset management, we can control the asset, determine the true values of assets and also have some idea for improvements of the organizational turnover by decreasing the loss.

Broadly, asset management refers to any system where the values of an entity or group are monitored, maintained, upgrade and also disposed in a systematic cost effective way. Basically by the asset management process, the built systems of facilities are efficiently monitored and maintained. It has some objective and it also provides the best possible service to the user. So, this type of management maintains the IT assets with respect to control, risk and cost.

IT asset management life cycle consists of some inventory functions that give the support of asset procurement to asset disposal and replacement. There are several advantages of the asset life cycle. The enterprises generally gain a lot from their IT asset life cycle management programs. Many reported benefits are by products, such as operational efficiency, vendor management etc. But the primary benefits are low cost, greater control and improved decision making [13].

Most organizations think of the cost only when they are purchased, but the real costs of an asset are associated with many other factors, such as installation, maintenance, disposal of the asset etc. Through IT Asset Life Cycle, organization easily monitored the present status of asset and providing the right services to the people who need them.

Enterprises also achieve a big gain by increasing the control on the asset like better management planning, replacing the asset, tracing the disposed asset or monitoring the active status of the asset which reduces the security risk issues. According to the asset life cycle, asset requires a process to add asset in the system. After that, asset can be upgraded or disposed which turn benefits for the enterprise, as a decision can be made based on knowledge of the asset availability and utilization. So, easily asset management life cycle prevents the waste of an asset and helps in the proper utilization of assets.

IT asset management generally means the set of business practices that join financial, contractual and inventory functions to support life cycle management and strategic decision making for the IT environment [6]. According to ISO/IEC 19770 some basic processes are there to manage the IT asset in a systematic way. They are Organizational Management Process, Core Process and Primary Process Interfaces [1].

Organizational Management Process mainly establishes and maintains the system with some policies and procedures. In this process the roles and responsibilities for related assets are clearly defined. Core Process is the main inventory process

for asset management. It has mainly three parts. They are: Asset Identification, Asset Inventory Management and Asset Control. General asset life cycle describes in the Fig1, portrayed different phases of an asset. Firstly, the Asset identification is mainly used to select and grouped the necessary classes of assets. Then various categories of asset

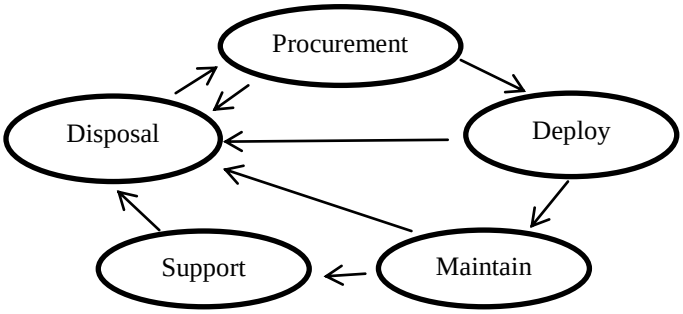

Fig1: Asset Life Cycle

are to be stored in a proper place. These operations have been performed in asset procurement and deployment phases. So, the items to be managed are chosen using some selection criteria. Next, the Asset Inventory Management Process ensures that the physical instances of the assets are properly stored. So, it is very useful to protect the assets from some unauthorized access, change and corruption. It also provides the effective role for asset recovery. Then the Asset Control Process provides the control mechanism over the assets and changes to the software and related assets, while maintaining a record of changes to the status and approvals. Asset details can be modified and also be repaired if needed. All those modification operations are to be performed in the maintain and support phases. So, some policies and procedures are developed, approved and issued before the release of the software. After the completion of all these stages, asset can be disposed successfully the system. This disposal of assets is the last phase of the general asset life cycle. According to the general asset life cycle in Fig1, it is possible to dispose the asset from any of its previous stages. It is possible to dispose the asset after procurement. Asset can also be disposed from the stage of deployment. After the use of the asset, user can also be able to dispose the asset and after maintenance or support phase, asset can be disposed if needed. The Primary Process Interfaces are generally consists of some life cycle processes that are required to maintain and manage several types of assets of a system. For the example, the hardware life cycle model is described in fig 2.

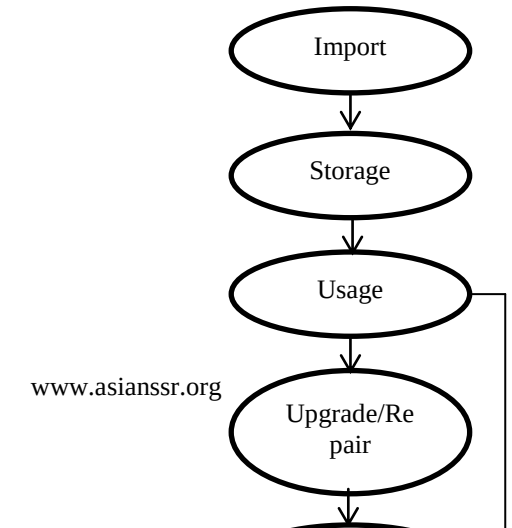

Fig2: Hardware Asset Life Cycle

The main phases of this cycle are Import, Storage, Usage, Upgrade/Repair, Export and Destroy. In this hardware life cycle, a product of hardware is imported first. Then all the details of this hardware asset are to be stored in a safe and appropriate area for further processing. After that the asset is used for a specific purpose of the system, and then it is to be upgraded or repaired (if possible). Next, the hardware asset is to be exported from the system. After passing through all the life cycle phases, it will be destroyed. In the newly introduced IT asset management tool, the entire hardware assets are following the hardware life cycle. All the hardware assets are having some relevant information to manage and maintain the hardware asset. Suppose a printer is manufactured. Then it will be connected to the set of computers and will also be used. If it will get damaged, then it may be repaired otherwise the damaged printer will be replaced.

VI. TOOL DESCRIPTION

Asset Management tool is basically following the asset life cycle processes. This tool is designed to identify and maintain an organizational asset. Four types of asset are considered by the tool. These are hardware, software, and network and information asset. First, a user identifies the category of the asset. The asset can be of hardware or software or network or information asset. Then the identified new asset details are inserted into asset record. Single or multiple asset details of a particular type of asset category can be inserted at a time. Bulk of asset of a particular type can be inserted through excel sheets. Sometimes asset records need to be updated or the assets which are no longer be used need to be disposed. User

can also update and disposed the existing asset details from asset records. In case of software and network asset, after use, some of the assets may need to be uninstalled from the network system. So, asset details can be uninstalled as per the user's choice. The main output of the asset management tool is asset inventory report. The report is to be generated on the basis of asset type and its critical level. The asset criticality level can be represented in 5 point scale. Highly confidential asset is taken as highest criticality leveled asset and internal asset can be taken as a lowest critical leveled asset in the system. Using the asset report, user can easily see the list of assets of the organization on the basis of some conditions. User can get the asset inventory report depending on the category of asset, criticality level etc. The asset inventory report is displayed on the screen in a table format. User can also download the report in pdf or doc format. The information flow diagram of the tool describes in the Fig3. Here, an authentic client sends some request to an asset management service. Then asset management service executes and generates the response with the help of the asset management database. Then the response is to be sent to the user. If the user wants the asset inventory report, then the asset management service generates the report and sends it to the user. User can easily show and download the asset inventory report if needed.

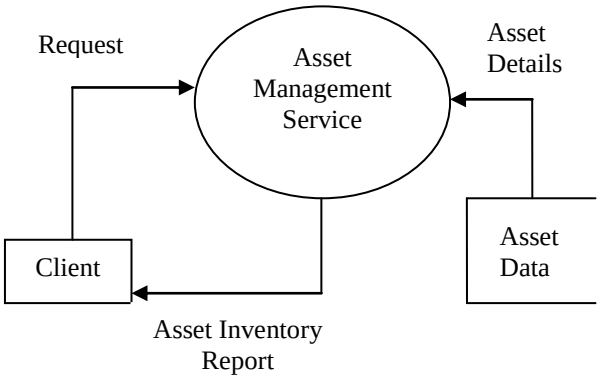

Fig3: Context Level Data Flow Diagram of Asset Management Service

Asset Management Tool needs a standard platform to execute in a standalone system successfully. It can easily execute on windows or Linux environment. Hardware and software requirements are also not very high. JDK 1.6, Net Beans 6.5.1, MS SQL 2005, iReport 3.7.6 and a web browser are needed to execute this tool. It can be useful in several organizations like academic institutions, multinational companies etc.

VII. CONCLUSION AND FUTURE WORK

IT Asset management tool helps to manage huge amount of the asset. . It also tracks all the essential components and owned the current status of each item. In addition, it ensures the legal and licensing compliance on the complete visibility of hardware, software and network assets. The graphical user interface is also very user friendly. User can easily access the tool. This tool is very useful to any academic institutions or industries to maintain their assets in a cost effective way.

This asset management tool is an independent tool. So, it can be worked with any other tools as add on service. This tool properly follows the asset management life cycle and also ready to manage four types of IT asset competently. Now a day, some tools have been developed to manage the asset of any enterprise. But many of them do not follow the asset life cycle. They do not able to work with hardware, software, network and information asset at a time. But, this newly introduced IT asset management tool can successfully handle these four types of asset. Not only single asset, but multiple asset information can be easily added by this tool. Multiple assets with the same configuration details can be inserted at a time by just providing the asset instance number. On the other hand, multiple asset with different configuration can be inserted via uploading the excel sheet at a glance. Thus, any organization can be benefitted if they will use this IT asset management tool.

Some future work can be done to improve the execution of this tool. More search criteria can be implemented. Fields can be case insensitive to make the tool more user-friendly. More criteria can be added in case of report generation. Information asset can be archived for some future use of the organization.

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