Experience with an IT Asset Management System

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DESY has introduced an Asset Management System (AMS) as a central tool to support the management and maintenance of its technical infrastructure. The first release is in production since spring 2002 in the IT department, where it is used for software license management, for improving the purchasing of standard equipment, and as a central repository. The repository is the basic component of the AMS. It holds the inventory of DESY's IT equipment, and in addition for IP devices like e.g. computers, printers or switches, the network configuration. It is used for asset tracking, i.e. equipment moves, adds or changes. The software license management is built on top of a scanner, which recognizes the installed software and hardware configuration of a computer. The scanner data is imported into the repository, and the AMS creates reports on software usage (and diversity) in departments and compares the installed applications with available licenses. The paper describes the AMS solution, shows example data (reports) and summarizes experience. An outlook is given to following releases, which are planned to extend the scope to safety equipment or accelerator components.

1. INTRODUCTION

1.1. Why Asset Management?

Asset management is a business discipline, which describes the management of technical infrastructure for business operation.

When talking about assets everybody has the same questions related to these devices like “Who is the user of this device?” or “Where is the device located?” (Figure 1).

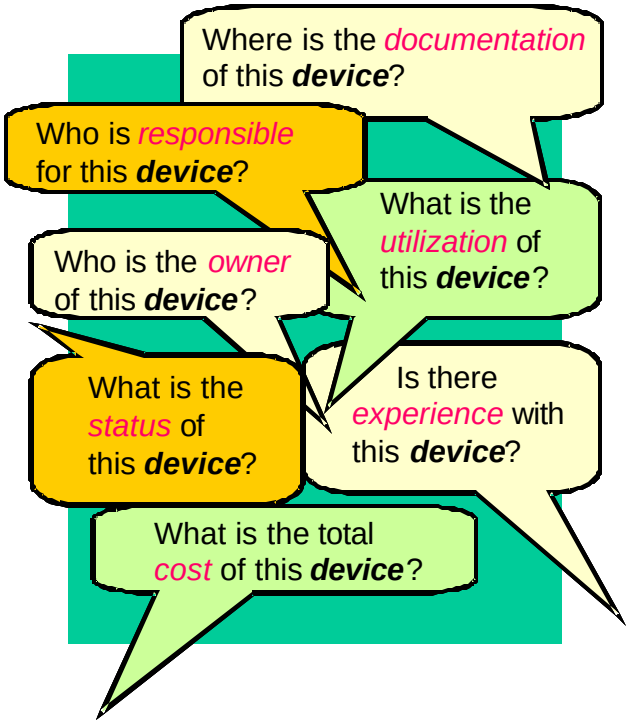

Figure 1 Common questions on devices, replied by an Asset Management System

An Asset Management System is able to answer this questions and to deliver in addition reports to support management decisions.

DESY has introduced an IT asset management solution, which covers the management of IT infrastructure like computers, monitors, printers and software installations.

In the long term DESY plans to extend the asset management solution to other devices. Core fields of application for asset management are accelerators with magnets, vacuum pumps, power supplies and so on or safety equipment like e.g. elevators.

1.2. Mission & Goals

The IT asset management project has three main goals which are implemeted as logical modules:

1. **Software license management**
   matching of used and available licenses on Windows computers
2. **Procurement of standard resources**
   to reduce the process time and needed man power for the delivery of e.g. PCs, monitors, components, …
3. **Common central repository for IT devices**
   to track and configure all IT devices within one information system

2. ARCHITECTURE

The Asset Management Systems is based on a three tier architecture (Figure 2).

- A transaction server controls user access roles, offers a workflow engine for the E-procurement process and other workflows e.g. to control the data consistency like unique IP and MAC addresses of computers etc..
- The system repository is managed by an central Oracle DBMS installation
- The fully functional native client offers a GUI to access all information and control the specific logical modules.

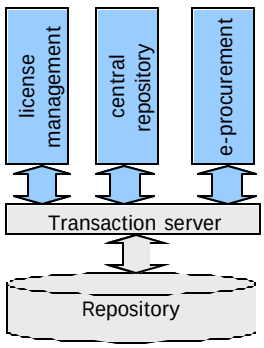

Figure 2 Logical architecture

Figure 3 shows a simplified data model of the system. The main objects are assets like e.g. PCs, printers or monitors.

They can be part of or be connected to other assets. Assets of category computer may also have software installations.

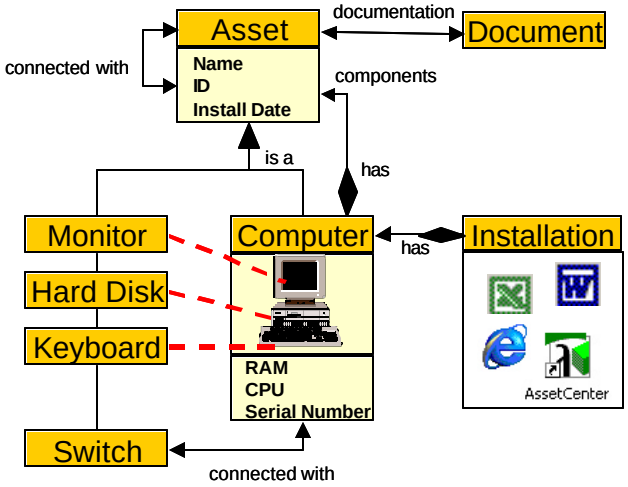

Figure 3 Simplified data model of the AMS repository

The system has three main deployment components: The data sources, the core AMS and the data presentation (Figure 4).

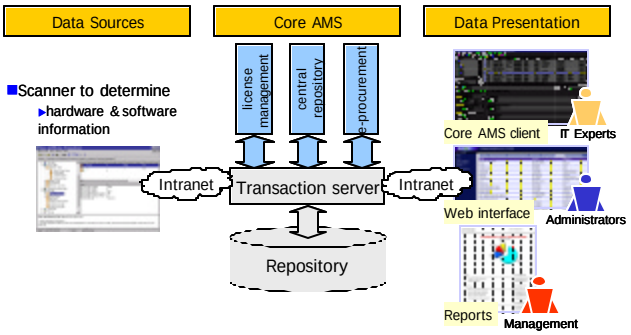

Figure 4 Deployment architecture

The main data source is the scanner which gathers the installed software installations and hardware information like IP configuration from the scanned computers.

The core AMS offers the repository, the transaction server, data modell for the specific modules, and interfaces.

Data presentation covers the access to the system with a native client, a Web client, and the data analysis (reporting) tools.

3. RESULTS

The first system release started in spring 2002 with the logical modules software license management and e-procurement. An inventory of the DESY IT infrastructure has been done and a test of the E-procurement started with about 10% of DESYs purchase requests.

In March 2003 a second release of the license management with an improved scanning mechanism (software detection) and an extended reporting for group administrators started. The scanning is performed invisibly for the user to improve the acceptance for the scanner.

The following chapters show important results of the data analysis and benefits of the system.

3.1. Hardware Inventory

For upgrade planning and cost calculations the detailed analysis of the hardware infrastructure is essential.

Technically computers are overaged after three years and often need to be replaced by new hardware. Figure 5 shows the distribution of age of the desktop computers in a sample group. 23 computers are technically overaged.

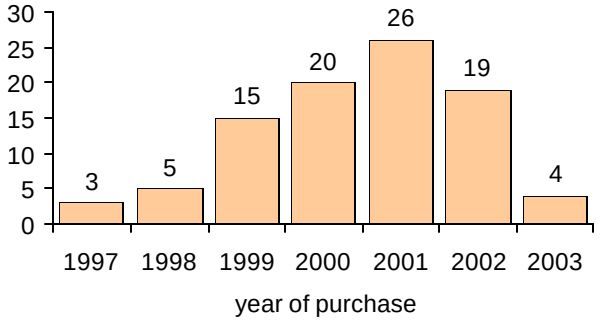

Figure 5 The distribution of age for the groups desktop computers as given by the date of delivery

A detailed report of the hardware parameters of these computers as shown in Figure 6 and Figure 7 allows to get a more precise replacement strategy.

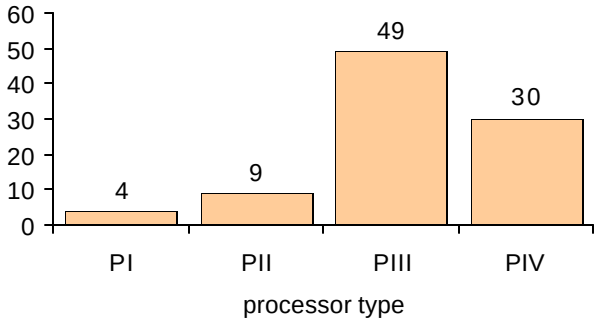

Figure 6 Processor types of the groups desktop computers

Only 13 computers are equiped with old Pentium I and Pentium II CPU´s (Figure 6). These computers should be replaced by new hardware. All computers have a minimum of 128MB main memory (Figure 7), which is enough for most of the standard applications.

Ten overaged computers are left which could be used for less capacity demanding applications.

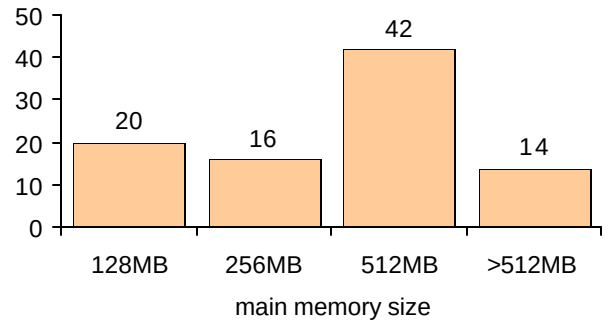

Figure 7 Main memory size of the groups desktop computers

It´s possible to save replacement budget for ten computers by changing the usage of computers addicted to the hardware requirements of the used software (e.g. Office instead of CAD applications).

3.2. Installation Report

The system administrators of the groups are interested in the software which is in use in their group. A Web based reporting tool offers this installation report (Figure 8).

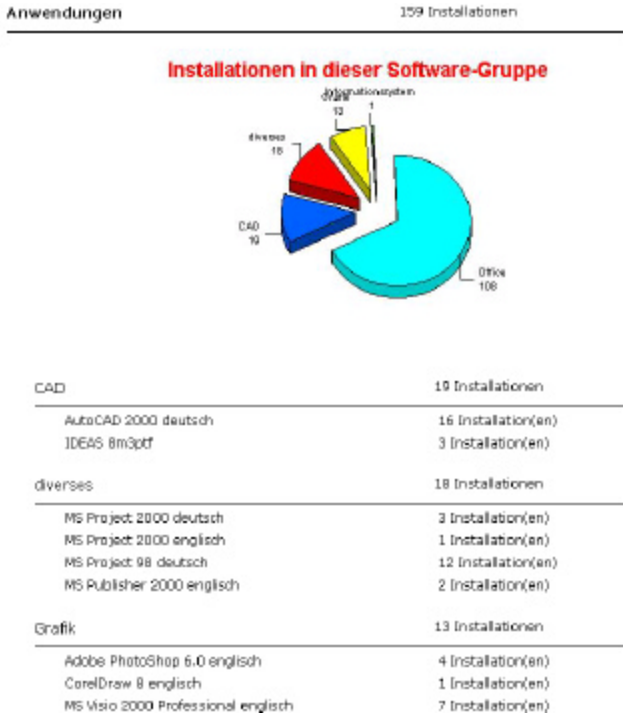

Figure 8 Installation report for group administrators

3.3. Analysis of SW Installations

The number of concurrent installations of similar software applications or software versions on each computer is shown in Figure 9. On the average, e.g. 1.1 mail clients are installed. This report offers economic potentials to reduce the number of expensive licenses. Double installations of software versions are detected and cut down.

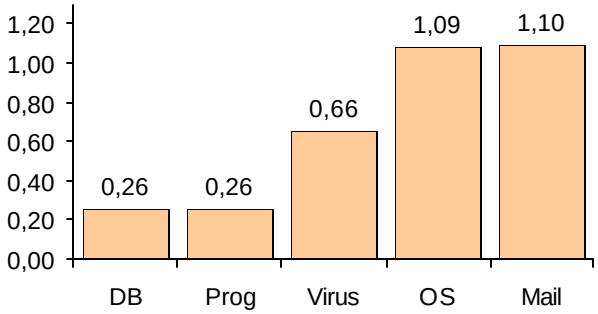

Figure 9 Software usage report to discover the number of concurrent similar applications installed on a computer

For security reasons its from special interest that only 66% of the groups computers are protected by virus scanners. This is a call for action to drilldown to the individual computers and install such tools to improve the IT security.

3.4. Software Compliance

The described scanner software is able to gather both, software and hardware information from the computers. The combination of these information is used to examine the suitability of computers for the introduction of new software applications or e.g. an operation system upgrade. The szenario, shown in Figure 10 estimates the number of necessary hardware upgrades and new computers for a operating system upgrade to Windows XP at DESY. The data are analysed by the recommended system requirements for Windows XP.

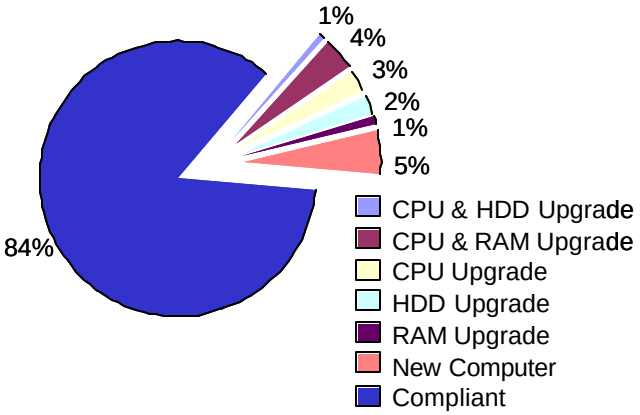

Figure 10 Compliance report for a Windows XP upgrade szenario (system requirements recommended by Microsoft: 300MHz CPU; 128MB RAM and a minimum of 1500MB free HDD space)

16% of the computers are not compliant to use the new operating system. About 370 computers need to be replaced. The total estimated cost for the new computers and hardware upgrades are about 300k$.

3.5. License Usage

The license usage report (Figure 11) lists the number of seats against available licenses and therefore is the main resource for license management.

The report displays the level of over or under licencing of particular software products which are in use. The necessary ordering of additional licences can be optimized by these information.

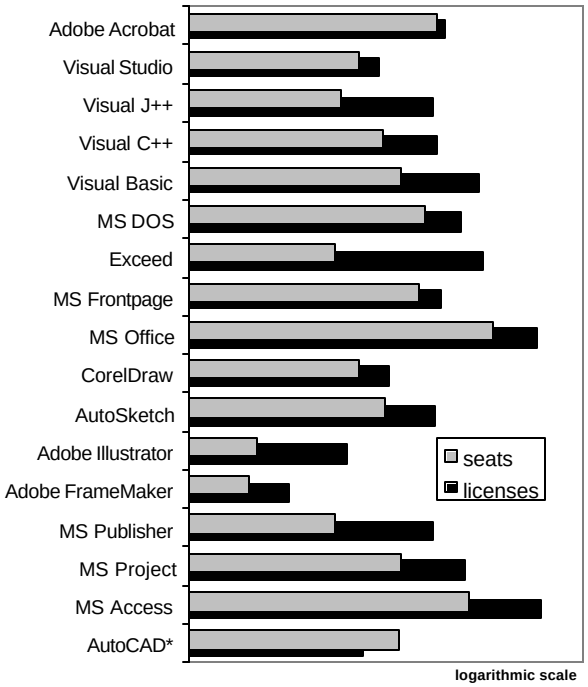

Figure 11 The number of available licences compared to the number of seats using it. The package AutoCAD is used under a floating license, a license management server controls and limits the number of concurrent users

3.6. E-Procurement

Due to the implementation of a workflow based E-procurement process, users are able to place a request for standard IT equipment via a Web interface. Two technical and two financial approval activities are followed by the preparation and delivery of the goods (Figure 12).

Figure 12 Implemented E-procurement workflow for standard IT equipment

The ongoing system test achieved a reduced process time from before more than three weeks down to about 6 days (Figure 13) and reduced the "paper work" and the postal ways extremely.

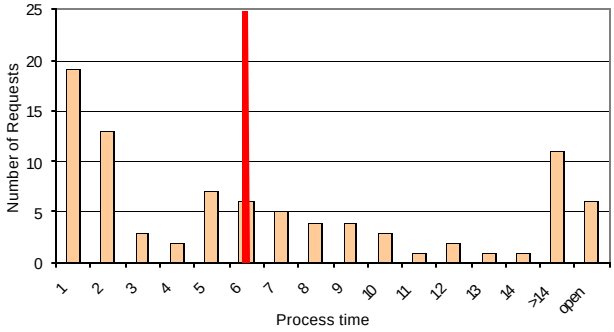

Figure 13 Average process time of the E-procurement process for standard IT equipment requests

4. EXPERIENCE

Systems like AMS have an impact on the culture of administrators work and the divisions and groups. The used infrastructure and utilization of the components becomes transparent. This demands management support.

To improve the system acceptance it was extremely important to deliver results and benefits very early to the customers. The provision of a web based reporting interface archieved an acceptance enhancement, because customers where able to get results like inventory overviews or installation reports easily without using an extensive native client.

The focus on highest priority user requirements is important to keep the solution small at the beginning and to stay independent from other systems.

Additional efforts where caused by the variety of used operating systems and computer configurations.

An early involvement of critics was helpfull to give them the possibility to consider their requirements and provisos.

The time to define and implement the system took about three years, thereof one year to compose the requirements document, nearly two person years for the inventory data adjustment, and about 2 years for the implementation and roll out.

A lot of effort was spend for the automatic inventory update via the scanner. To relate the scanner results to an object in the AMS a device ID stored in an indicator file on the computer is necessary. Other system information like hostname or MAC address are able to be configured or replaced, so they are not feasible to identify a computer. The decision was to use a device ID which is a label on the computer case. In case of central requested computers this ID is available in the SMBIOS and a tool is able to read this information and write it back to the computer when the indicator file is lost.

5. OUTLOOK

As described, DESY plans to extend the asset management solution to other devices like accelerator components. The general purpose data model (Figure 14) allows to manage all kind of assets.

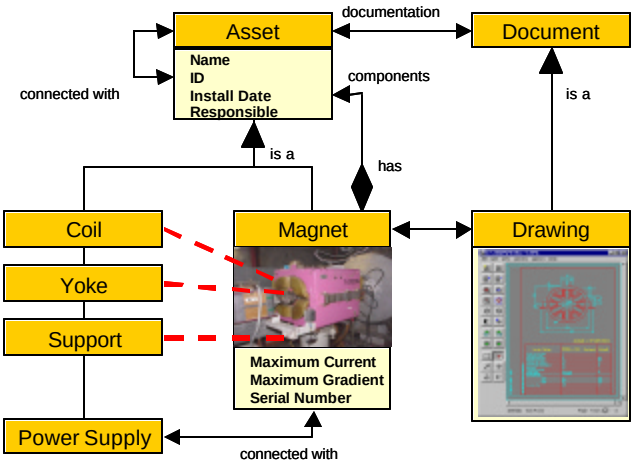

Figure 14 Example for a general purpose data model containing both, IT devices as shown in Figure 3 and accelerator components

Figure 3 shows the model of a computer. Computers have components like hard drives or a keyboard. These components are also assets. A computer is connected to other assets like network switches, and computers have individual attributes, e.g. the computer name, an ID or the responsible person.

Figure 14 shows the same data model to describe a magnet. Also a magnet has components, here the coils or the stand. Magnets are connected with a power supply and also have individual attributes like the name, coordinates, serial number or a barcode.

Important is the acces to technical drawings and other documents. Therefore an integration with a product data management system (PDM) was developed to search the PDM repository for related documents [1].

6. REFERENCES

[1] J. Bürger, L. Hagge, J. Kreutzkamp, K. Lappe, M. Leonhard, A. Robben (DESY), "Concepts for Integrating Information Systems", CHEP'03, San Diego, March 2003.