SaaS – direction of technology development in ERP/MRP systems

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ABSTRACT

Purpose: The main issue of this paper is present modern SaaS technology (Software as a Service) used in ERP/MRP class systems designated for production companies from different SME lines.

Design/methodology/approach: The paper presents assumptions and aims of implementation of SaaS systems on a background of classic computing system licences designated for company management.

Findings: A present state of SaaS software development produced for manufacturing and enterprise resource planning as well as expected development directions of this technology in systems prepared for SME sector were introduced in this paper.

Research limitations/implications: Further researches should be concentrated on particularizing specificity of requirements of production companies which want to change to outsourcing in systems working with SaaS mode.

Practical implications: The paper presents a set of parameters which should be considered during a process of choosing one of ERP/MRP computing rank systems in SaaS technology for manufacturing company service.

Originality/value: The paper might be useful for person dealing with modern technologies in ERP/MRP rank systems.

Keywords: Industrial management and organisation; Production and operations management; SaaS; Software as a Service; ERP/MRP computing systems

MATERIALS MANUFACTURING AND PROCESSING

1. Introduction

A source of popularity gained by SaaS (Software as a Service) models derives from convincing companies boards that purchasing modern computing systems together with infrastructure which is necessary for its activation as well as initiating and teaching staff to use modern business tools are only means of reaching the goal such as capturing a market advantage.

In this context SaaS technology, which means providing services of remote access to software (software hiring), currently experience dynamic development and starts to be supported by biggest producers of ERP/MRP systems on the world.

Advantages of working with SaaS models:
- low initiating costs,
- big initiating speed,
- low subscription costs,
- lack of necessity of installing any software on a workstation belonging to a system user,
- on-line access to system from any location by computer with an Internet connection,
- elimination of license and upgrade costs,
- low TCO costs (Total Cost of Ownership) due to lack of necessity of major investments in servers, databases and maintenance,
- continuous access to the newest software versions compatible with actual law regulations,
- access to the newest business technologies,
- predictability of costs bore on computing systems.

It seems that in the nearest future research and development works carried out on ERP/MRP systems will be concentrated on:
- wide implementation of SaaS technology [1-2],
- implementation possibilities of easy user defining and applying of multi-criterion reports generated on a base of information stored in those systems [3],
- implementation of modern methods of strategic management [4-13].

2. License, ASP and SaaS

In face of description introduced above one can have impression that SaaS is nothing more than a well known model of software hiring (outsourcing) in ASP (Application Service Provider) mode. But despite a certain common features SaaS and ASP are two different technologies.

ERP/MRP system hiring in an ASP mode consist in an idea that single customer service takes place in a separate system placed on a designated only for him server. In SaaS model each customer also works on "his own" personal server. Though on any server belonging to provider several customer systems can work simultaneously. Each customer in such model has an access to his own personal data. They are appropriately protected against access of any other customers working on this server. SaaS model is usually used by small and medium companies while ASP is used by medium and big companies. System licenses in which applications are installed directly on a customer server are due to high TCO costs reserved only for big companies.
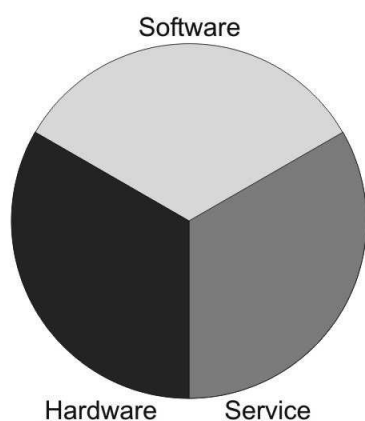

Fig. 1. Distribution of costs bore by company for purchasing traditional ERP/MRP system license

In outsourcing (ASP and SaaS) user individually establishes number of employees who are granted with an access to the system working with a standard Internet web browser and on this basis pays license fee for hired computing system.

There is a lack of limitations regarding maximum number of users. Systems prepared to work in such modes are optimized from the point of view of high scalability and network activities efficiency.

In license versions and also quite often in ASP user makes use of (and pays) for whole available functionality of given solution. In SaaS user has a possibility of choosing only selected, actually used functions. Additionally possibility of temporary turning on or of a range of useable functions within rented system modules is enabled. It is often used during seasonal phenomenon occurring in a life of each company. Holiday season can be an example. During that time due to absence of employees not whole range of computing system functionality is needed.

Common feature of ASP and SaaS distinguishing them from license is also easiness of implementation. It usually takes place

after system parameterization and is based on an information gained from future user (company). Information needed for correct parameterization:

- basic registration data as well as telecommunication and address data, organizational structures, information about subordinate warehouses and treasuries,
- required by user individual parameterization of some module (among other: Production, Warehouse, CRM, Sales, Accounting),
- level of entitlements for individual employees within an access to different functions in purchased modules.

After short period needed for generating new system version for an individual customer service-provider informs about possibility of starting the work in SaaS mode. Longer activation of ASP mode is caused by necessity of additional setting of new hardware architecture dedicated individually for each user in a specialized center of data processing Data Center. Companies which offer systems in SaaS often enable access to demonstrative version of fully function system. It opens a possibility of testing an application in real conditions before it will be hired.
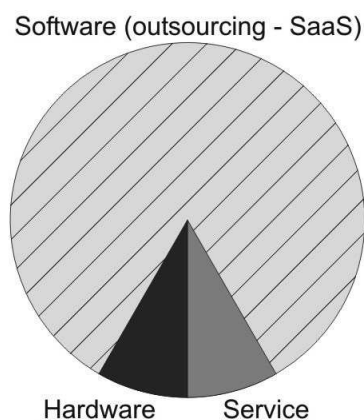

Fig. 2. Distribution of costs bore by company for hiring ERP/MRP system in a SaaS mode

Systems prepared to work in SaaS mode differ from each other in following aspects:

- **Payment type**. In case of simple applications it is often practiced to charge a fee for specific number of executed operations (usually in accounting systems). In complex solutions (ERP/MRP systems belong to them) in overwhelming part lump sum payment is used to charge for a period of using the system. During that period users can carry out not limited number of operation within purchased functionality.
- **Part carried out by IT branch**. In SaaS, system provider takes full responsibility for proper functioning of system needed for correct company functioning. Due to this a significant drop of importance (and significance) of belonging to user company IT branches is noticed. The higher levels of warranty efficiency and reliability provider ensures the lower employees number is needed in the IT branch.

- **Server location**. According to SaaS mode definition server together with software is localized in specialized center of data processing Data Center belonging to system-provider. Users are granted with an access to the system by internet web browsers. In special cases SaaS service-providers offer option with renting their server together with software and locating them in a place pointed and owned by user. Though in such case provider employees have no possibility of access to a source code as well as to a system logs.

Most producers existing on the ERP/MRP computer systems market originally created their solutions in order to sell it in a classic form of license ordered product or as an application sold in "a box". Only lately while searching for new markets, companies extend their systems with a possibility of group work, on-line access through mobile devices (PDAs, smartphones) or new possibilities of enabling to customers systems in a rent form (outsourcing). ASP (Application Service Provider) exemplify a first stage of this trend. Now when market needs for such services are still growing SaaS mode also spread widely. Disadvantage of such approach is that original system architecture designed for monolithic work often becomes an obstacle for making full use out of advantages of on-line work. Systems offered by global producers due to their significant build-up are usually very technology retarded and cannot quickly adapt to changing market requirements. It also happens to introduce new technologies with an use of unprepared for such occasions accidental programming tools. Only use of complete design, production and implementation chain on all SaaS mode system creation stages enables creation of advanced product which will allow to achieve satisfaction for both user company and SaaS service-provider. That is why correct assessment of company potential is so important. Due to that, knowledge of reliable quality evaluation indicators of services offered by provider is necessary.

3. Evaluation parameters for SaaS provider

In case of decision about choosing SaaS model it is worth knowing parameters which should be considered during process of estimating credibility of software hiring service provider. Below the most important ones are introduced:

- **Data security**. Transfer of so called „sensitive" data, essential for company functioning beyond own computing systems introduce a risk of loosing them or possibility of acquiring them by rival company. In that context it is extremely important to check data security procedures and mechanisms guaranteed by provider.
- **SLA warranty (Service Level Agreements).** It is a contract in which service provider guarantees specific level of service provision. It includes guarantee of high efficiency, accessibility and safety. Provider guarantees that even in case of his server breakdown, power shortage or gaps in Internet delivery work will be immediately undertaken by emergency means of data processing Data Center which are all the time ready to automatically take over whole load generated by users of SaaS systems.

- **Possibility of data export and ways of access to archival data.** Companies may want to migrate from SaaS systems. In such case it is extremely important to have a possibility of exporting data into new systems. In other cases, like suspending company activity or company bankruptcy, due to tax inspection there might occur a need of looking through the data from a few past year. It is important to check whether provider takes into consideration such situations and whether he has prepared sets of procedures. Worth checking is also height of fees charged for exporting data into different systems and fees for access to archival data after agreement termination.
- **Possibility of data import.** It should be checked whether in case of decision approving the transfer to SaaS model import of already owned data is possible.
- **Parameters reporting.** Because SaaS is based on a remote access to "own" data it is crucial for mentioned earlier SLA contract to include exactly defined efficiency parameters which should be accessible for easily performed controls and clearly reported by provider.

Provider have to own also additional parameter which should be considered. It is a report created after audit executed in SAS 70 standards (Statement of Auditing Standard No. 70) [14]. It is an international standard of executing audit prepared by American Institute of Certified Public Accountants for companies whose activities have an impact on customers finance reports. Companies providing SaaS services should put themselves to a test compatible with SAS 70. Service providers can be asked by their customers or auditors analyzing their financial reports to present SAS 70 report which tells about procedures and effects of mechanisms put into practice within internal company control.

Although carrying out audit is not obligated by any law, in practice companies which want to show to their customers that they use the highest levels of data storing security as well as additionally authenticate themselves in client eyes should own SAS 70 report or be ready to carry out whole procedure on demand. SAS 70 checks if on all levels of transfers, accumulating and processing of information each element of telecommunication environment (servers, databases, systems, net and finally employees) adequately fulfill high standards. It checks also whether used mechanics of internal control have feasible impact on a quality of offered services.

4. Development directions - SaaS 2.0 and S+S

Despite relatively short history (since year 2000) of SaaS term understood as a special form of software renting we can observe at present an intensive development of this technology and changes from faze SaaS 1.0 to SaaS 2.0 as well as simultaneous development of S+S services (Software and Service).

Originally most available in new technology computing systems allowed company leaderships to rationally manage finance recourses (SaaS 1.0). At present emphasis is moved into direction of ERP/MRP systems which enable performing changes and modelling of complete business processes (SaaS 2.0).

Systems offered within SaaS framework include wide variety of issues which can occur in an existence of any company. Beside standard service areas of production, sales, purchase, marketing, logistics and accounting they assist also in workflow, company strategy planning and risk analysis.

The idea of S+S is to join the hiring of IT systems in SaaS mode and additional outsourcing of IT services. It often happens that those two services are provided by one company. Idea for such model derives from fact that companies eagerly choose complete services offered by a provider which can guarantee high quality.
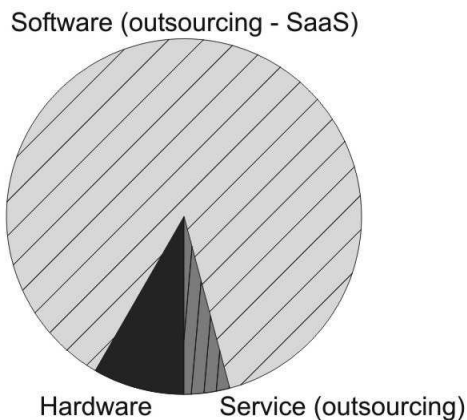

Fig. 3. Distribution of costs bore by company for hiring ERP/MRP system in S+S mode

Currently companies from SME sector are less and less willing to pay big single amounts designating them for computing system licenses. Development and simultaneous hardware and IT systems decapitalization is so fast that companies more often reach for SaaS models which ensure access to the newest ERP/MRP systems while keeping the costs on low level.

SaaS develops very dynamically worldwide. To the biggest companies offering products of this type belong Oracle, Symantec and Microsoft. This last one is a creator of some programs supporting SaaS development. SaaS On-Ramp and SaaS Incubation Center are examples of such programs which support both consumers and producers of SaaS software.

SaaS develops also in Poland. Producers of systems working in this mode are mostly companies from SME sector. One of the pioneers of this technology is HEUTHES Ltd. company which since year 2000 offers ISOF system [15], ERP/MRP class solution designated for companies of any type. Interesting might be a fact that ISOF was created on a base of Client-Web-Server. This technology owned by company, functionally identified with SaaS, was created independently in the same time period.

5. Summary

Currently observed fast development of offered SaaS systems is caused partly by growth of awareness and confidence of management personnel to systems offered in remote on-line mode as well as by common access to internet application. For example still some years ago most people distrustfully treated now very common e-banking which blazed a trail for systems available today in SaaS mode. Development and widespread of SaaS systems is an unalterable process. This paper presents advantages of SaaS and can be treated as a mini-guidebook for companies which will decide to work in systems offered in SaaS mode which support both production management (MRP) and resource management (ERP).

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