Management of a web site
What's new?

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Web sites are becoming increasingly popular and important to business processes. This emphasises the importance of maintenance and control of web sites. This article will describe the differences between traditional information systems and web sites and the implications these differences have on the management of the site. The focus is on Business Function Enabling and Application Management.

Introduction

In the recent years, there has been a vast increase in the popularity of the Internet (technology) within companies. A growing number of companies have been or are developing an Internet site or an intranet. Internet technology is increasingly being used as an aid and extension to existing business processes like sales and internal communication. The impact of web sites and Internet technology on the business processes of organisations is, therefore, increasing which emphasises the importance of maintenance and control of web sites.
Future maintenance and control normally receives little attention during the design phase of a web site. In practice, this results in a lot of problems. Even in organisations that did set up a maintenance and control function, problems occur when a web site requires changes.
Most problems are caused by the fact that the Maintenance and Control function for web sites requires a significantly different approach in some aspects compared to traditional information systems. In this article these aspects are identified and discussed using two models for maintenance and control: Application Management, an ITIL-like model for service management of applications, and Business Function Enabling, a model ensuring a consistent fit between business requirements and ICT services. It will become clear if and how these models support the required maintenance and control processes for web sites.
This article will use a couple of sample cases to show the importance of web site management. The differences between traditional information systems and web sites and the implications these differences have on the management of the site will be described. The focus is on Business Function Enabling and Application Management. Since there is no essential difference between the technical management aspects of web sites and those of traditional information systems, these aspects will not be covered in this article.

Problems encountered

The problems encountered by organisations can be placed in four categories;
- business goals,
- management,
- maintenance and control,
- technical and structural aspects.

Business goals
Business goals are often neglected when an organisation is building a web site. Even the goals of the site itself are often not clear.

Large organisations start over hastily because they are afraid of 'missing the boat'. Having a web site becomes a goal in itself. In smaller organisations, starting a web site is often the 'pet-project' of the IT-manager or the CEO. Once it is there, management becomes enthusiastic about the potential of the site and the site tends to grow gradually. In both cases, the business goals are hardly mentioned. This implies that the goals of the web site remain unknown for the organisation and even its management. At the same time, substantial support is asked of the business managers and business unit managers, as they are the sources for site content. This is one of the main reasons for the business units' lack of commitment to provide proper maintenance for the web site.

A medium-sized Dutch company wanted to change its image. A web site seemed to be the ideal way to reach this goal. Good thought was given to content, layout and presentation of the site and an external design studio built the site.
However, there was no anchoring of the web site within the organisation. Building the site started as the CEO's 'pet-project'. He thought building the site was a good idea because it could support the envisioned image change. This goal was achieved but since there were no other business objectives stated, the goal of the site remained unclear to the organisation.
Nevertheless, business managers were expected to contribute to the site by updating the content on a monthly basis.
A few months later the CEO left the company leaving the site without a sponsor. The web site received no management attention for over a year.

Management

The introduction of a web site has an impact on many parts of an organisation. Several departments and areas of an organisation are involved in building the site and supplying the content. This is true for Internet as well as intranet sites. Management of the site and alignment of the parties involved is essential, during development and upon completion of the site (especially because so many parties are involved). In reality, however, we see that there is often no management of the site and insufficient alignment between the parties involved. It is common practice that nobody is held formally responsible for the (content of the) web site. This results in the lack of budget for building, then eventually maintaining and controlling the site.

A company wanted to create its own intranet site. An investment proposal was presented to the board. This contained the initial development costs.
The financial manager, who also carried ICT, was implicitly responsible for the project. The project was conducted by the IT department. This led to the situation where control was triggered from a technical point of view instead of the business.
The board never realised that content and input for this site had to come from the organisation and that alignment and control required a business point of view. The result was that the web pages received little to no updates and their content did not coincide with the needs of the users, therefore, utilisation of the intranet did not meet with expectations.

Maintenance and control

As with traditional information systems, the actual use of a web site starts after the site has been completed. The focus, however, is on development and completion of the site, sometimes combined with a promotional campaign to create awareness of the site's existence. The maintenance and control is in most cases hardly acknowledged or the emphasis is on technical management (keeping the web site online).
A web site does possess a highly communicative character, which makes it crucial to keep the content up-to-date.
The lack of awareness regarding maintenance and control as well as insufficient funding, are the reasons that many web sites are not updated regularly. There are too few changes in the content and there not enough attention for application management (that is: management of the web site structure).

After the development of their Internet site was completed, the organisation became very enthusias-

tic. They wanted to have a web site that followed the changes in the organisation. In the meantime, the development team ceased to exist and only a minimal budget from which the technical maintenance could be financed.
The technical manager of the site only made sporadic changes in the content of the web site because it had to be done during his spare time. Soon the content of the site was no longer up-to-date. Little thought had been given to the management of the web site's structure (application management) that in turn caused the breakdown of the site's initial structure and the appearance of 'broken links' on the site.

Technical and structural aspects

In many organisations, a web site is regarded more as a communication tool, such as a newspaper, than as an information system that it should be. A web site is rarely regarded as actually a piece of software with its own structure and restrictions. This is another reason why many sites do not receive the required professional IT-support they should have. In many cases, somebody, for instance a communications manager, receives training in HTML and is made responsible for the changes in the web site.

In a large organisation with an infrastructure of several networks and servers, the intranet site was not given the attention it required. The communications manager was made responsible for the site. Once the development of the site was complete, the technical assistance stopped. The communications manager was not capable of performing these tasks. Due to his lack of technical knowledge, the maintenance of the web site was insufficient. Subsequently, this led to a decline in use and support of the web site by the organisation. This went so far as to create further confusion, when eventually nobody knew which server was used as the web server.

Since many problems with management of web sites are caused by the differences between web sites and traditional information systems; it is obvious that knowledge of the differences and their impact on maintenance and control is essential.

The following section will provide fundamental insight into web sites and the differences between web sites and traditional information systems.

Analysis

Is there a solution to the problems encountered by many organisations? To answer this question, web sites will be explored in a fundamental way.

A web site as an information system

Like any other information system a web site contains hardware, network, system software and 'the application-environment'. The application-environment is made of HTML-pages (Hyper Text Mark-up Language) or similar types of solutions. HTML is a hybrid-environment:

- It contains a variety of possibilities to add information, text, images and graphic effects and to present these in almost any style required.
- It also contains a clearly recognisable (but quite rudimentary) programming language; there are links (go to's) to other pages and other programming facilities like applets, input commands and scripts/controls to execute processes. This defines HTML as a programming language and a web site as an information system.

Therefore, this definition of a web site will be used:

A web site is an ***information system*** based on Internet-technology and comprises of technological communication possibilities (networks, browsers, web pages, applets,) that make it possible to access information and data in a user-friendly way.

There is a distinction between web sites and their underlying information systems

From a functional point of view, three aspects can be distinguished in a web site: layout, content and data (Figure 1).

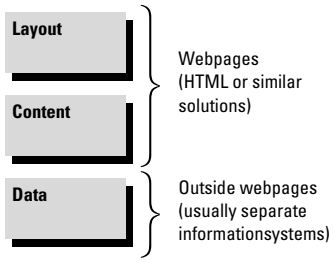

Figure 1 Functional aspects of a web site

Layout determines the 'look and feel' of the web site and is strongly related to the overall image of the web site. The effort put into this aspect has the purpose of making the site pleasant for its visitors and providing it with the image desired by the organisation. All of this can be accomplished with pictures, sophisticated graphic design, moving images, logos, colours, appealing headers, etc. The *content* is the information that is presented on the web site itself. This is mostly text with some additional tables and graphics. The content contains the message the organisation wants to send to the world.
Furthermore, web sites often offer access to external *data*. These are data accessed from underlying information systems or data-servers (Figure 2).
These are mostly data from information systems that support business processes like order and time sheet systems. Sometimes these systems are developed as a dedicated system for the web site such as, for instance, an E-commerce system. These systems are an implicit *part* of the web site but are developed as normal information systems with the aid of ordinary development tools like Oracle and SQL.
The distinction between content and data ensures that the communicative character of the web site is emphasised while the underlying systems hold their business-process character. This distinction makes allocating responsibilities and management tasks regarding the web site and the information systems clearer.

The differences between web sites and traditional information systems

A web site is an information system. There are, however, some important differences. These are summarised in Table 1.
Since these differences have impact on the management of web sites, the five most important differences are described more extensively below:

1. Functional needs and technical implementation are strongly linked;
   The traditional distinction between functional needs and technical implementation does not apply to a web site. This is caused by the dual character of HTML-implementations dealing both with content and with presentation, creating an inseparable bond between business function and its representation in the application structure.

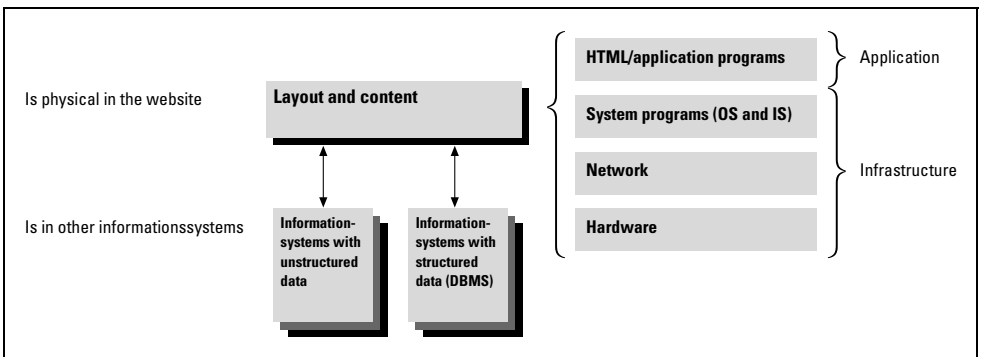

Figure 2 The structure of web sites

Table 1

	Traditional information systems	Web sites
Technical bases	Tables and programs	HTML and applets
Technology	Dbms, programming language	Web browser
Purpose	(Support of) business process: • Register, save or mutate data • Calculations or selection on these data	Communication or spread: • Information • Links to information
Users	Well defined group of users	Undefined group, sometimes the whole world
Scope	Specific business process	Company
Developers	Designers and programmers	Graphic department (layout) IT-department (site) Public relations/communications-manager (content)
Base unit	Structured data	Free format text
Layout	Finite and depending of infrastructure	Almost infinite possibilities
Structure	Depending on data, not depending on functionality	Depending on content; new page = new system
Change frequency	Data very high Programs relatively low	Content fairly high

2. Web sites serve a more or less undefined purpose;
   (Initial) Design of a web site is not directly linked to a business objective, nor is the business purpose that the web site serves fully clear. Nevertheless, the web site will be the organisation's window towards the outside (Internet) world. The design and development phases dealing with business objective and related questions require extra attention and broad, company-wide involvement.
3. Different type of control required;
   Control of web sites is more directed by enabling communication and less by content or message; the web site controller acts more like an information agent bringing supply and demand together.
4. Different types of users;
   At least two types of users can be distinguished: the internal users responsible for the web site itself and the visitors or 'surfers'. This requires a different approach to communication, the web site itself being the means of communication.
5. Short lifecycle;
   Web sites are, by nature, strongly linked to the organisation, its business and its presentation. Frequent changes occur, mostly causing a short lifecycle (1–3 years) of the web site and high costs of deprivation.

Application of models

As previously stated, web sites are information systems. Does this imply that they should be managed as such? When defining the maintenance and control processes for a web site it is important to recognise the main differences with conventional information systems. What kind of impact do the aforementioned differences have on maintenance and control? Can the models used for implementing maintenance and control for traditional information systems also be applied to web sites?
The following paragraph will explain how the models developed for information systems can be used for web sites as long as the differences between the two kinds of systems are kept in

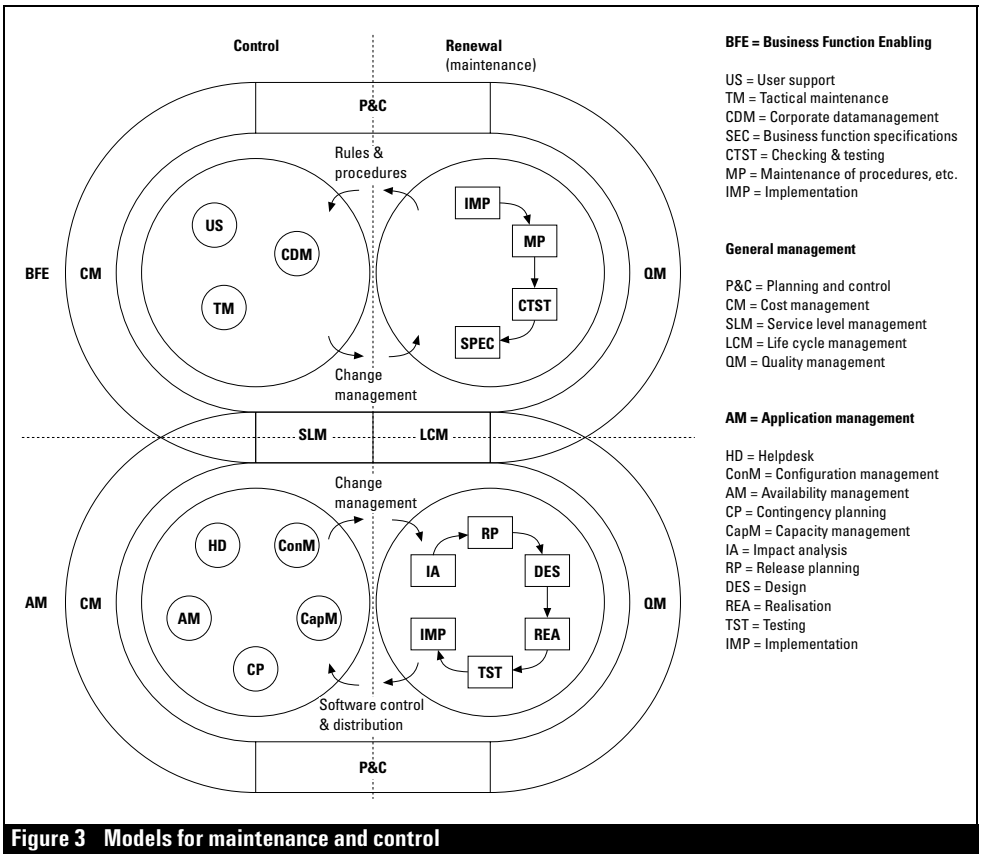

Figure 3 Models for maintenance and control

mind and the necessary adaptations to the models are made.

By projecting the differences on the models used for maintenance and control, Business Function Enabling and Application Management (see Figure 3[1]), it becomes clear that most processes can be implemented in the same way as for traditional information systems. However, the characteristics of web sites have impact on other processes. These processes require a specific implementation. This section will focus on this group of processes.

[1] The models are not addressed in this document; background information can be found in other articles (IT-beheer Jaarboek 1997 and 1998) or by contacting PinkRoccade Atribit.

General management processes

In this article, we already examined the problem caused by an organisation's mismanagement of the web site. Maintenance and control models for traditional information systems contain some overall processes that surround the maintenance and control processes. These processes are; Service Level Management, Cost Management, Quality Management, Planning & Control and Lifecycle Management. In these processes, several performance-criteria such as up time, number of interruptions, goals, costs, frequency of changes, anticipated lifetime and organisational fit are controlled and adapted.

The importance of these (in the model) surrounding processes is significant for web sites. Experience shows that these processes receive little attention during development, maintenance

and control of web sites. This causes the low manageability of web sites.
Lifecycle Management aims at the active control over the suitability of information systems. The suitability of information systems to business processes, the potential of those systems and the continuity of the infrastructure can trigger fundamental changes.
Lifecycle Management for web sites is different compared to traditional information systems. Traditional information systems have a lifetime of more than 10 years. Web sites, however, have a lifetime of no more than 2 to 3 years before they are rebuilt from scratch. Dynamics cause the rapid ageing of web sites but web sites are also more related to the organisation. There is often a new 'look' and organisational structure and thus a new web site.
Developing a new web site is often a good decision because of their rather small size and low integration in the business processes. When web sites become larger and more integrated in the business processes, rebuilding is no longer an option. A controlled situation will produce minimal demand.
A well-planned and adequate structure of the web site is important to be able to make frequent changes efficiently. It is, therefore, important to make the right choices to ensure flexibility and to monitor them during the process of renewal.
As web sites tend to have a short lifecycle, it is questionable if implementing Lifecycle Management extensively is a good choice, In the future, when the lifetime of web sites increases, the importance of this process may also increase.

Renewal processes for Business Function Enabling and Application Management
Information systems and web sites change continuously. For web sites, this is even truer than for traditional information systems because information and content keep changing.
There should be attention paid to the renewal processes that create these changes. These processes have a functional side (triggering the change, guiding and testing its implementation) and an application (changing software and documentation).
Looking at web sites we can see two types of renewal:

- fundamental renewal: a process comparable to that of traditional information systems. Large parts of web sites are being renewed; often triggered by changes of layout, image of the site and changes in the organisation;
- renewal of the content: for traditional information systems this process is carried out within Business Function Enabling (Data definition Management and Data Management). Traditional information systems do not have to be changed because data and programs are separated. This is different for web sites: HTML pages contain content and commands, so changes in the content can only take place if the pages and the site, the impact on the structure is often small, but the number of changes is very high. In the long term, the effect is significant. Since there is often a lack of knowledge to keep the web site well structured, the structure of the site deteriorates.

In respect to web sites, the processes Application Management and Business Function Enabling are mixed, which causes restrictions for the content manager or the structure of the site. A solution for this problem has not yet been found:

1. The functional manager (content manager) or the content owner changes the pages of a web site, but becomes responsible for the technical quality of the site in the process. The pro of this solution is that changes can be made quickly and efficiently. The con is that the functional manager becomes responsible for something he/she is not trained for and for which he/she should not be responsible;
2. The functional manager changes the content him/herself with some restrictions. He/she retains the option to change pages but has

some restrictions regarding the distinctive split and structure of information. He/she accepts lay-out restrictions. The functional manager becomes jointly responsible for the technical quality of the site. The advantage is that the structure of the site remains better;

3. The functional manager supplies content to the application manager who makes the actual changes. The advantage of this solution is that the technical structure of the site is preserved and an optimal layout can be established. The disadvantage is that the process becomes time-consuming and expensive.

When designing a web site it is recommended to make the structure as generic as possible, which allows for changes in the content without obligatory changes in the structure of the web site.

Control processes for Business Function Enabling

The goal of these processes is to keep, from the user point of view, the information system working and up-to-date. The clusters of processes to be acknowledged here are: User Support, Corporate Data Management and Tactical Maintenance.

User Support

One of the most important processes of User Support is the Helpdesk process. Web sites often have two types of helpdesks:

- the webmaster (who takes care of technical comments and sometimes questions about the content);
- contacts (often per set of pages), where information can be obtained.

The contact can be a specialist (in this case there is often more than one mentioned on the site) but sometimes there is only one entry point.
It is recommended (as for traditional information systems) to keep User Support so there is one place that monitors the performance of the site.

Most organisations try to keep their helpdesk for traditional information systems skilled (able to help users immediately). Keeping the helpdesk of a web site skilled is very difficult because of the scope of web sites. The solution is to let the helpdesk help the users to find the specialist who can answer the question. To meet the demands of users regarding reaction time it is necessary to translate these demands to the 2nd line. (specialists who can answer the questions)
User communication is also different for web sites. Since users of traditional information systems are employees and have to be authorised as users they are always known. This is not the case for visitors of web sites. Compared to users of traditional systems the visitors of web sites are complete strangers to the organisation. There are ways to get information about the visitors; asking questions, counting the number of 'hits' and monitoring how long visitors stay, but this is almost entirely one way traffic. Communication, briefing and training is hardly possible. The only adequate medium for communication with users is the web site (for intranets this is somewhat different). This has to be kept in mind at the design of the site. The quality of the site strongly influences the user communication. This process can be enhanced by effective monitoring and control.

Corporate Data Management

Data Definition Management and Data Management form this process. In web sites there is no distinction between Data Management and design. This is the earlier described juncture between functional and application management.
Corporate Data Management forms the process that changes the content of the web sites and keeps it up-to-date. More than one party will be involved in supplying the content. Several parts of the organisation will participate in this process. There should be one party that is responsible for the content of the site. This is the web master who, like a newspaper's editor, has the overall responsibility for the content.

Tactical Maintenance
The last processes in this cluster are the Tactical Maintenance processes. These processes take care of the long-term suitability of the systems and their demands. The emphasis is on triggering the continuous processes of Application Management. The next paragraph will look further into that topic.

Control processes for Application Management
The Application Management model has several processes within application management to let the system (enduring) perform compliantly. These processes are Contingency Planning, Availability Management, Configuration Management and Capacity Management.
The added value of a web site is often strongly influenced by these processes. This is caused by the lack of feedback possibilities from users/visitors. If, for example, the web site is malfunctioning, users/visitors will not (be able to) give feedback which is bad for the organisation's desired image. This requires specific attention while in practice it is hardly ever done. Continuous monitoring is also desirable. The processes that take care of this are mentioned above.
The process of configuration management aims at the management and location of the objects within a web site. Compared to traditional information systems, this process is more complex and intensive because the dynamics of web sites are much higher. This is caused by many aspects. The content of the pages (the programs of a site) changes more often, web pages contain more additional objects (like images, tables and applets), the outerworld changes faster (links to other web sites) and the infrastructure changes faster (new browser versions, etc.). It is important to stay attune with the latest developments because there is strong competition: 'inviting' sites are visited sooner and more often.
The possibilities to support this process are still in the early stages, but are showing great potential.

Conclusion

In this article, we focused on the importance of implementing the maintenance and control processes for web sites. We have stipulated three reasons for this:
- a web site is an information system,
- there is no real distinction between structure and content due to HTML-technology,
- from a control point of view, web sites should be separated from their underlying information systems.

It is important to realise that the differences between web sites and traditional information systems require a different approach when it comes to the control of these systems.
The different approach is especially triggered by the communicative character, the 'first time right' concept and the short lifecycle of web sites.
Existing methods for maintenance and control can be used as a base. Some processes must be tuned to the specific needs of web sites.
Due to the nature of a web site it is recommended to combine certain tasks especially those dealing with the content and presentation of a web site.
Tactical Management and Lifecycle Management will become increasingly important when web sites grow in size and are not easily replaced by new ones.
General management processes require the same attention and definition as for any other information system, although this is not always recognised for web sites, as it should be.