

Analysis of Routine and Applications for Documentation Management

- Focus on Stena IT-Services

Frank George Mensah

DEGREE PROJECT

The University of Trollhättan · Uddevalla
Institute of Informatics and Mathematics

Thesis for Bachelor of Science

Analysis of Routine and Applications for Documentation Management - Focus on Stena IT-Services

Frank George Mensah

Examiner:

Steven Kirk

Institute of Informatics and Mathematics

Supervisor:

Inger Björkman

Institute of Informatics and Mathematics

DEGREE PROJECT

Analysis of Routine and Applications for Documentation Management - Focus on Stena IT-Services

Abstract

The advent of Information Technology has brought with its wave, diverse ways of administrative documentation. For the sake of simplicity and the purpose of this paper, I would limit the definition of documentation to creating a document, its management – updates and distribution - and its storage, as well as its retrieval.

The days when documents were made in as many copies as would be physically circulated, with the alternative being that files and folders, in some cases envelopes, were passed from one desk to another, are well behind us. But the sophistication that has replaced this sluggish and exacting procedure, if tampered with negligence could result in a situation of ‘deja vu’.

This thesis takes a look at how to combine a well-defined set of routines with a good application for managing documents to benefit from the sophistication of modern documentation. It also analyses the *infrastructure* for documentation at Stena IT-Services (STIT).

Besides, this paper examines available applications for managing documents and recommends a suitable one with a set of routines, taking into consideration the categories of documents at STIT.

In order to find the best solution possible for STIT, interviews were conducted with some members of staff at STIT. And for an insight into what obtains elsewhere, similar interviews were conducted with users from three other companies.

Frank George Mensah

EXAMENSARBETE

Analys av rutin och verktyg för dokumentation

Informationsteknologins tillkomst förde med sig många olika sätt att hantera dokumentation. För den här uppsatsens skull vill jag begränsa definitionen av dokumentation till dess skapande, hantering – uppgraderingar och delning – samt dess sparande och upphämtning.

För i tiden skapades dokument och kopierades i så många exemplar som behövdes för att skicka runt till användarna; med alternativet att skicka pärmar och ibland kuvert, från ett skrivbord till ett annat. De dagarna är sedan länge bakom oss. Men om man använder den nya teknologin med dess finesser på ett slarvigt sätt, kan resultatet bli en återgång till det gamla sättet.

Detta examensarbete diskuterar hur man kombinerar väldefinierad rutiner med verktyg för dokumentationshantering för att utnyttja finesserna i modern dokumentation. Arbetet analyserar infrastrukturen på Stena IT-Services.

Dessutom letar denna uppsats efter tillgängliga verktyg för dokumentationshantering, och rekommenderar ett som är lämpligt för STIT tillsammans med rutiner; med hänsyn till kategorier av dokument på STIT.

För att hitta det bästa lösningen för STIT, intervjuades folk som är mer eller mindre involverade med dokumentation på STIT. Användare från andra företag intervjuades för att få en insikt på vad som gäller dokumentation i andra företag.

Frank George Mensah

Utgivare:	Högskolan Trollhättan×Uddevalla, Institutionen för Informatik och Matematik Box 957, 461 29 Trollhättan Tel: 0520-47 50 00 Fax: 0520-47 50 99		
Examinator:	Steven Kirk, Lektor		
Handledare:	Niclas Ingeström, Stena IT-Services, Göteborg		
Huvudämne:	Datavetenskap	Språk:	Engelska
Nivå:	Fördjupningsnivå 1	Poäng:	10
Rapportnr:	2003:D05	Datum:	2003-05-21
Nyckelord:	Dokumentationshantering		

Acknowledgements

I am indebted to a myriad of names by way of gratitude I owe them for the success of this paper. Here, I would mention but a few of them since time and space would not permit me to mention all of them; suffice it to say that from the bottom of my heart I appreciate the support of even those not mentioned here.

Firstly, I would like to give special thanks to Niclas Ingeström of Stena IT-Services for entrusting me with the responsibility of performing this task. Secondly, I would like to thank the staff at STIT for their co-operation during the time I spent with them. Special thanks go to my supervisor Inger Björkman and my tutor Steven Kirk at the University of Trollhättan. Their discussions and suggestions goaded me to *turn stones that I may have left unturned* in my research.

Lasse Blomquist of Magnet, Lars Klintell of Scandinavian Seaways and Kristina Pålsson of Scandlines: I am thankful to you all for taking some time off your busy schedules to do interviews with me, and for sharing your ideas on the topics treated in this paper.

Many thanks also go to Microsoft in Sweden for promptly responding to my mails and for giving me permission to use their images in my illustrations [15].

My final thanks go to the following people: my course and classmates at the University of Trollhättan who helped in diverse ways in thinking aloud with me; and the friends of mine who served as my *third eye* by proof-reading my report.

CONTENTS

<i>Abstract</i>	<i>ii</i>
<i>Acknowledgements</i>	<i>iv</i>
CONTENTS	- 1 -
1. Introduction	- 3 -
2. Background	- 4 -
3. Objective and scope of this thesis	- 4 -
4. Properties of a good documentation management tool	- 4 -
4.1 Storage and categorisation.....	- 5 -
4.2 Change history/life-cycle.....	- 5 -
4.3 Access and retrieval.....	- 5 -
4.4 Indexing.....	- 6 -
4.5 Full-text indexing.....	- 6 -
5. Method	- 6 -
5.1 Current System.....	- 7 -
5.2 Problems with the current system.....	- 7 -
6. Interviews	- 8 -
6.1 Background of questionnaires.....	- 8 -
6.2 Internal Interviews	- 9 -
6.3 Analysis of internal interviews	- 9 -
6.4 External interviews	- 10 -
6.4.1 Analysis of external interview – Magnet.....	- 10 -
6.4.2 Analysis of external interview - Scandinavian Seaways.....	- 11 -
6.4.3 Analysis of external interview – Scandlines	- 12 -
7. Comparing and contrasting internal with external	- 12 -
7.1 Tool and categorisation of documents	- 12 -
7.2 Retrieving stored documents.....	- 13 -
7.3 Restrictions on rights.....	- 14 -
7.4 Change history and updating	- 14 -
8. Results	- 15 -
8.1 User requirement.....	- 15 -
8.2 Design of system.....	- 15 -
8.3 Pros and cons of available options - tools	- 16 -
8.3.1 Laser Fiche.....	- 16 -
8.3.2. Microsoft Share Point Portal Server.....	- 17 -
8.4 Choice of suitable tool based on requirement.....	- 19 -
9. Recommendation of routine	- 19 -

Analysis of Routine and Applications for Documentation Management

9.1 Follow-up to introduction.....	- 20 -
10. Conclusion.....	- 20 -
References.....	- 22 -
Appendix A: Questions for internal interviews.....	- 1 -
Appendix B: Interviewees - internal.....	- 1 -
Appendix C: Questions for external interviews.....	- 1 -

1. Introduction

In every organisation, be it commercial or voluntary, keeping records and a well-defined routine for managing documentation is very important. We are living in an era when despatching and sharing of documents are the fastest in the history of mankind. Megabytes of documents can be transmitted across the globe in almost no time. Various users, each located at the remotest corner of the globe can access the same document nearly within the same time limit as a colleague next door. This, however, requires some input on the part of the users - observing some routines in addition to the implementation of some administrative application or other. More so would be the case with an Information Technology department of a large-scale company in the calibre of Stena Line Company Limited.

With the right management tool, coupled with some good routine or other, several gigabytes of documents could be accessed within milliseconds; whereas the wrong approach could mean a reversion to the physical days of desk-to-desk distribution of documents.

Change in an organisation is often very sensitive and requires a subtle approach to ensure its success. The right approach would be embraced by all involved, making the transition smooth, whereas an atmosphere of *order from above* could easily be created with the reckless approach. Stena IT-Services (STIT) has the means of benefiting from today's sophistication of Information Technology - as compared to the pre-computer days. But documentation has been neglected for nearly a year. This has resulted in dissatisfaction among the members of staff due to difficulties in locating vital documents.

I believe the findings of the feasibility studies that gave birth to this paper would provide the final impetus required to take the bold step towards changing their routine for documentation.

I am also convinced that, with the seriousness which the leadership views the present problem, coupled the determination and co-operation of all the members of staff, the much needed change could be effected smoothly.

Section 5 of this paper describes the prevalent *infrastructure* at STIT and how it functions. The first part of section 6 discusses interviews with the members of staff at STIT, who are directly involved with documentation, while the second part of the same section compares the current situation at STIT with what obtains in other companies.

A discussion of *users' requirements* for STIT's documentation management is taken up in section 8. It is followed by the availability of tools on the market today and finally, a recommendation of a suitable one for STIT, in addition to a set of routines.

2. Background

Stena Line Company Limited is one of the leading shipping companies in Scandinavia. The company, with its head office in Gothenburg, has branches spread, not only over Scandinavia, but all over Europe. Its Information Technology division, Stena-IT Services (STIT) develops and administrates the company's IT- operations. The division is also responsible for the maintenance of documentation of their system and IT-solutions. With the vital role that STIT plays in the company, it is very important that documentation is managed with high efficiency.

The leadership at STIT is aware that their documentation has, for years, been neglected. About a year ago - in the year 2002 - they renewed their entire infrastructure: servers, networks, thin clients, printers etc - and created an entirely new basis of documentation for the company.

However, the leadership still presumes there is a great risk of documentation not being comprehensive, and that it is not up to date due to the lack of routine and an effective application for the management of documents. This lack of routine and effective application has led to complications in searching for documents. One therefore, understands the concern with which the members of staff at STIT view the present condition. The determination of the leadership to alleviate the situation gave birth to this thesis.

3. Objective and scope of this thesis

The objective of this thesis is to analyse the infrastructure regarding documentation at STIT, and to use the analysis as a basis for recommending an administrative tool for their documentation. The leadership at STIT intends to utilise the outcome of this analysis as a guide in taking a decision on documentation management. Below is a check-list for the report.

- To examine the current infrastructure and analyse how it functions.
- Identify the problems with the documentation at STIT.
- Find out what obtains in other companies and compare with STIT.
- Specify a *user requirement* for STIT.
- Check the market for available documentation management application
- Recommend a set of routines for documentation at STIT.

The analysis does not cover tracing documents that might have been misplaced or lost in the course of this period of neglect at STIT.

4. Properties of a good documentation management tool

When paper documents are received in an office, they are organized to make them handy. They are usually labeled, sorted, indexed, stapled, placed in folders and filed in a cabinet. Similar steps apply to electronic documentation.

... Retrieving documents in a busy workplace could be chaotic. Electronic documents are no different... [8].

Therefore, managing documents electronically requires some application with the following attributes: Storage, Change History/lifecycle, Access and Retrieval. In the next section, I am going to analyse these attributes. Then in section 8.1 I will tailor-measure an application to suit the requirements of STIT.

4.1 Storage and categorisation

A good storage system should not only provide a long-term and reliable storage for documents. It should also accommodate changing documents, growing volumes, advancing technology and categorisation.

...During storage, there should be the possibility of sorting out the various documents under different categories. And to keep track on categorisation, it is important to have some standard in order to keep the storage system in a proper order.... [7, 9]

4.2 Change history/life-cycle

With the use of electronic documentation, changes and alterations are simplified more than ever. A good document management tool should make changes possible with ease. This would enable stored documents being updated without necessarily keeping various and different copies; with history of the changes making it possible to see the versioning information [11].

Sometimes, it is required to keep track of a document's change history. For instance, documents that originate from one source, and have to pass through other sources for notifications, comments and approval before final copies are circulated. Following the life cycle and versioning of documents, one would know whether the documents are still under processing or have gone through all required updates and approvals.

4.3 Access and retrieval

Accessibility is another important attribute of a document management application. Accessing stored documents should be possible in different forms. Viewing should be readily possible to those who need it; with flexibility.

...Access to and of digital preserved work can be expanded infinitely with no threat to the quality and existence of the original works... [6]

Much as it is vital to make accessibility flexible, so is some control required for the *safety* of sensitive documents. Some documents are required by people just in order to carry out instructions or their work. Controlling the rights of users – so that some can only read, without the permission to alter the contents, is sometimes required to protect such documents. This would safeguard the integrity of documents.

Retrieval capability is essential in managing documents. It makes finding the right documents fast and easy. A good retrieval system uses information about the documents, including index and text, to find documents stored in the system.

...Users need to be able to use common sense tools to find any document within the system based on what they know. In some cases, this means browsing through folders, in other cases it could mean conducting index field searches... [7]

4.4 Indexing

Indexing documents, using categorisation fields and keywords is a method traditionally used with paper files. This method translates very well into electronic systems. Different types of index field data such as date, number and numerical characters are very useful. Index fields can be used to categorize documents, track creation or retention dates, or record subject matter, among other uses... [10]

The use of the document name and folder view to find a document can be helpful and intuitive, but is not always the best method. Sometimes a person will know exactly which document they need, but not know what folder it was placed in, or how the document was named.

...Using index field information to find a particular document can also be helpful. Index field searches allow users to comb through millions of records in seconds to find their needed documents... [7]

4.5 Full-text indexing

Some systems can only find pages based on indexed keywords. This method is not always helpful because the person who selected the keywords may not be the one searching for the file. That is where full-text indexing is helpful. By providing full-text indexing, documents can be found using any word or phrase in the document, even if those words are not part of the keyword index.

...To maximize search effectiveness, an intelligent search system should be able to combine template searches with full-text searches with document or folder name searches into one comprehensive search... [7]

5. Method

The directives leading to the feasibility studies indicated that documentation at STIT had been neglected for about a year. It was required to interview some selected members of staff to ascertain how the current system works: how they create documents as well as updates and changes. Therefore, the first few days were spent examining their documents.

The next stage was to interview those directly involved with documentation at STIT. Then I interviewed people in the other companies for the sake of insight and comparison.

5.1 Current System

The very first impression confirmed the fears of the leadership and the members of staff at STIT: documentation had, to say the least, been neglected to a great extent. There are several drives on the network containing their documents. But the main repository for most of their documents are on the drive labelled 'J'. Below is a sketch of the main hierarchy for the documentation.

The main tree is *Infrastructure* with the second in the hierarchy being as follows: Citrix, Client, Network, Satellite and Service/Agreement. The others are Storage, Telecommunication, Win and VMS.

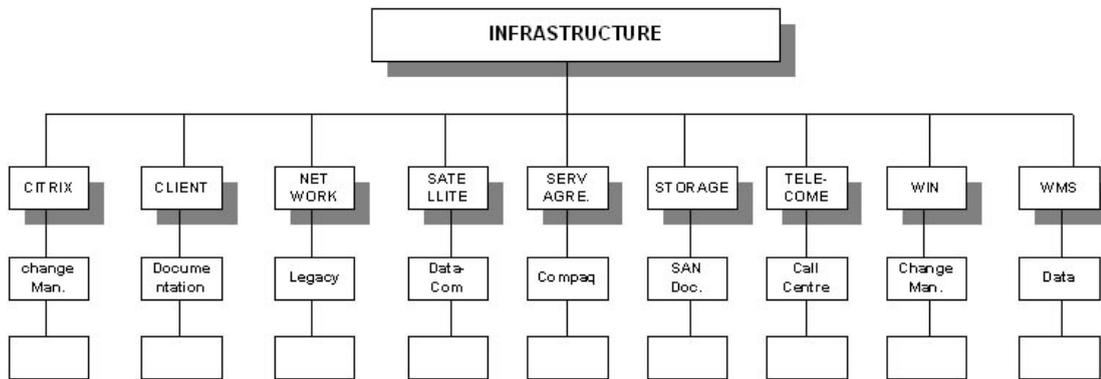


Fig. 1

This diagram illustrates the present storage system at STIT. At the top of the hierarchy is infrastructure. Next in the hierarchy are nine directories, each with a number of sub-directories.

The documents are in the following formats are: Microsoft Word, Excel and Power Point. The others are: Gif, Notepad, PDF and Visio Technical Drawing.

5.2 Problems with the current system

A handful of the documents are filed in a good order. Related documents are filed in the same directory, with documents being dated and having captions – satisfying the basic properties for proper storage. But on the average, the system is lacking in many respects. There is no particular structure in the order of storage. Nor is there any general pattern or routine for managing documents. Folders are simply created at random and documents stored in them. This has led to duplication in some cases.

In other cases, the basic properties of documents, like the author, the caption, and the subject are missing. This requires reading through such documents to make out their purposes. Some files simply do not contain useful information, while some folders and sub-folders are empty – the contents apparently having been removed. The problem with the existing situation could be summarised as follows:

- Documents are spread on several drives on the network.
- The hierarchy for storage on the network is not well structured.

- Directories and sub-directories are created at random.
- Most of the documents lack the basic properties of documentation.
- No information on updates and change history.

Generally, there is no particular routine for documentation. And the resulting situation is quite obvious: difficulty in managing documents.

Such practices, if allowed to continue, would in the nearest future lead to more complexities in the system. The tendency is that the creation of directories and folders would continue in the random manner, and automated searching for documents would be more time consuming; that is, if it is possible at all. This is because in this case the only possible search tool might be a simple tool like *Microsoft Windows*' search, which lacks well-defined search capabilities.

6. Interviews

It was the desire of the leadership that interviews are conducted with some of their members of staff who are directly involved with documentation at STIT. It was a way of getting first-hand experience of the existing situation. This is because:

...Through interviews, one can obtain experiences, opinions, desires, feelings or relations... [1]

There was also the desire to get a glimpse of what pertains in other companies regarding documentation; most especially, companies in similar branch of business. The interviews are therefore, two-fold: internal and external.

However, some of the external interviews were not easy to deal with since they were conducted in written forms. K. Burell and Jan-Axel Kylén described such problems this way:

...There could be setbacks with written interviews if the interviewees misinterpret the questions... [1]

I discuss the problem I encountered with the written interviews in section 11.

6.1 Background of questionnaires

The questionnaires for the interviews were designed in a way to suit their purposes. Regarding the internal interviews the leadership at STIT desired to know how the users involved handle their documentation and the difficulties in retrievals. So the questions were designed after examining their documentation which gave me an insight into the current problem. Therefore, some of the questions posed were how they store and update their documents as well as how they retrieve them. Details of the questionnaire can be found in Appendix A.

With the external interviews, the leadership wanted to know what pertains in other companies in order to be able to compare and contrast with what prevails at STIT. So some of the questions asked were what Administrative tools they use in managing their documents,

handling of users' access and updating documents. Details of the questionnaire can be found in Appendix C.

6.2 Internal Interviews

A list of those directly involved with documentation was provided: see Appendix B. The interviewees were handpicked by the leadership at STIT due to their direct involvement with documentation. On the commencement of the feasibility studies, these staff members were notified beforehand, of the leadership's intention to have them interviewed on the problem. The notifications were received by all as welcome news. So, scheduling the interviews was done with ease. Their various opinions which I obtained through personal interviews, contributed tremendously to gaining insight into their system and putting this report together.

6.3 Analysis of internal interviews

The internal interviews revealed two clear things about the current condition: frustration among the members of staff over the current situation and the desire for a change. It is obvious that everyone is unhappy and frustrated about the current situation. And there is an urgent craving for the situation to be brought under control. The following reasons, apart from the fact that documents are spread over several drives on the network, are the main causes of the frustration:

- Unauthorised users gaining access to stored documents and altering them.
- Retrieving one's own documents and that of others is very time-consuming.
- There is the lack of standards for documentation.
- Certain documents need change history and versioning.

Even though opinions on the prevailing situation are unanimous, there are two aspects over which opinions are split – the restrictions concerning rights to updating and altering documents, and assigning a particular person to be in charge of documentation.

But altogether, there is one positive fact about the situation: the willingness to contribute towards all measures that would be taken for the much-needed change is overwhelming.

The main questions posed to the members of staff in the interviews can be found in Appendix A.

Viewing the user requirements from the perspective of the staff members - individually - the new system to be introduced should have the following properties:

- An Administrator to be assigned the responsibility of documentation
- Restrictions on rights to some documents e.g. workers on project and temporary employment be given *read only rights*
- Easy and speedy retrieval of documents
- Avoidance of duplication of documents
- Validation of documents before acceptance for storage and circulation
- Change history and life-cycle of documents, enabling versioning

- A management tool that can search through file folders and captions as well as searching through the contents with the help of key words – full-text indexing
- A structure with some good hierarchy and a good search engine
- The possibility of inserting logos and letter-heads to documents when needed, i.e. merging documents.

However, the view presented generally is slightly different. That is, designing a system for the general use of STIT. This is discussed in the section on user requirements in *section 8*.

6.4 External interviews

The purposes of the external interviews were to establish what prevails in other companies for the sake of comparisons, to assist in getting insights into others' situation; and perhaps, to get more ideas of available tools and routines. The external interviews conducted with three other companies in nearly the same branch of business were very helpful in arriving at a conclusion. The three companies are Magnet, Scandinavian Seaways and Scandlines. Magnet is a Computer consulting company, while the other two are shipping companies.

Appendix C shows the questions posed in the external interviews.

6.4.1 Analysis of external interview – Magnet

The interview with a staff member at Magnet presented a better functioning documentation management system, comparatively. Users at Magnet do not have any problems whatsoever with their documentation. Storage, updating, change history and searching: all function well. Details of the interview are as follows:

- There is no categorisation of documents at Magnet. The reason is that they handle a limited volume of documents. Most of the documentation are systems documents in Word format and they do not have any document management tool.
- Apart from their systems documents, most of their searching is done in their booking system known as *Super Star*. It is not a fully-fledged database management tool, but it has some qualities of a database management tool, and it allows indexing, which in turn simplifies and speeds up searching. Thus, retrieving documents at Magnet is without difficulties. However, it needs to be pointed out once again, that they handle only a minute volume of documents – as compared to what pertains to STIT.
- The program, *Super Star*, has a mechanism called *Transactions Code* for handling different rights – read and write. This mechanism, in effect, is the check on individual access and rights.
- In most cases, updating occurs in their *Super Star* Booking System. It is a web-oriented booking system written in the archaic programming language of Programming Language 1 (PLI), for VMS platforms. With the *Transactions Code* mechanism, users effect updating of documents themselves.

6.4.2 Analysis of external interview - Scandinavian Seaways

This part of the feasibility studies was very sensitive. Scandinavian Seaways is a company that could easily be regarded as direct competitors of Stena Line in many aspects. They are not only in the same branch of business; their business activities cover almost the same geographical area as Stena Line. Therefore, obtaining an interview for a purpose of this nature was not without difficulty. Handling it with carelessness could have raised suspicions of some ulterior motives.

The approach used to overcome this difficulty was creating contacts on personal notes. I managed to get in touch with the IT department of this company. Eventually, owing to the busy schedules of the person in charge, the interview was conducted partly over the telephone and partly through electronic mails.

Details of the outcome of the interview with Scandinavian Seaways are:

- Scandinavian Seaways have just purchased some programme for the purpose of managing communication between their vessels. The main reasons are to get control over rising volume of documents like electronic mails and file handling for their systems documents. The second reason for the new acquisition is to keep the running costs for the management of these documents low. Their documents are categorised in Hyper-Text Mark-up Language (HTML), Adobe Acrobat and some databases which have web-oriented interfaces to simplify access over their intranet. Other categories of documents are images of their various boats and authentication certificates. However, there are some other documents that fall out of the categorisation due to their peculiar nature. This makes their categorisation non-comprehensive.
- When storing documents: “they usually endeavour to exercise administrative discipline” (borrowing their own words). They have allocated spaces on their servers for all shared and common documents.
- Some of their documents, but not all, are stored in databases. With the help of a database management tool, searching is made easy – to some extent. This also makes retrievals much faster; most especially when the volume of documents is substantial as in their case. But since there are some documents that fall out of the scope of the database, retrieval of stored documents is done not with total ease as the case might be in searching fully with a database management tool. The fact that they also handle an enormous volume of documents does not make searching fast enough.
- Rights to documents are restricted. Not all users have full rights to documents. Some users have full rights while others can only read certain documents without the rights of altering them. This is done in order to protect documents that are sensitive in nature. For less-sensitive documents, users are given full rights – read and write. They are mostly operational documents used for day-to-day business activities.
- They do not have a particular routine pertaining to change history. But there is some control regarding updating of some documents. For instance, International Safety Management (ISM) documents attract more restrictions than ordinary daily documents.

6.4.3 Analysis of external interview – Scandlines

This is another sensitive part of the feasibility studies. Scandlines is based in Helsingborg, but being in the same branch of business as Stena Line, it could be rightly argued that they are competitors. Approaching them for an interview was thus, made *unofficially*. After some telephone conversations, they agreed to answer some questions through mails.

Below are the details of the interview with a staff member at Scandlines:

- At Scandlines, there is no application for the management of documents. Documents are stored in the ordinary way – in the form of files and directories over their network. Their documents are not stored in databases, and as a result, they do not utilise any database management tool. Categorisation of documents is applied only with their different systems documents.
- Retrieving documents at Scandlines is done with no notable difficulties, although documents are not stored in a database. Nor is there the use of particular tool for managing documents.
- Restrictions on rights to accessing documents are handled in quite a different way at Scandlines – compared to all the other companies dealt with in this report. All users have only *read* rights to documents, but no one has any rights to make changes in documents.
- With such strict regulation on accessing documents, there is no implementation of change history in any form at Scandlines.

7. Comparing and contrasting internal with external

The criteria for comparing and contrasting what obtains within the three companies I have handled in this report are as follows: my description of the properties of a good documentation management tool I discussed in section four, the data I obtained in my feasibility studies at STIT and from the various interviews – internal and external.

It would be appropriate to mention here that, direct comparison in some cases may be a mismatch. This is due to the fact that there are variations in the following: the size of the organization, the volume of documents they handle and the rate of operational activities. These aspects I have not delved into in this report.

7.1 Tool and categorisation of documents

This is another aspect of documentation management that is handled differently by all the companies discussed in this report.

- In terms of management tool and categorisation, it seems Magnet has it best among the four companies. Their documentation comprises, mostly, of systems documents written in *Word* format. With such a scanty volume of documents handled at Magnet,

documentation management functions quite well, even though no management tool is in use and there is no categorisation.

- Scandinavian Seaways have just acquired some programme for the purpose of managing communication between their vessels. The objective is to get control over rising volume of systems and management documents and to keep their running costs low. At least, some of their documents are organised in a database, and as such, they make use of some database management application. Besides, their documents are partially categorised: even if non-comprehensively.
- There is no document management tool in use at Scandlines. But some of their documents; their systems documents are partly categorised.
- At Stena IT-Services there is some categorisation of documents which is not really observed in general terms. But there is no management tool.

7.2 Retrieving stored documents

Retrievals are also handled in different ways in all these companies.

- In spite of the fact that there is no use of any management tool, document retrievals are without difficulties at Magnet. Most of their operational documents are systems documents as mentioned in section 6.3.1. Apart from that, they have their *Super Star* booking system which has some qualities of a database application.
- At Scandinavian Seaways, documents are partially categorized. In addition, some are stored in a database. Thus, it can easily be argued that there is some form of ease and speed in retrieving stored documents – as compared to situations with neither categorisation nor databases.
- Document retrievals at Scandlines are not difficult, even though they do not utilize any management tool. And their documents are not stored in a database.
- Retrievals at STIT are painstaking and time consuming. The volume of documents is quite substantial. There is no search tool available apart from Windows search function. Documents are partially categorized and not stored in a database. In the wake of the large volumes of documentation and several users accessing them at random from various locations, some form of control on rights would be very beneficial. More so would be the case when workers could be engaged on contract and project basis.

The next section takes a look at various forms of restrictions in the companies being discussed in this report.

7.3 Restrictions on rights

In documentation management, this attribute is sometimes controversial. Some documents need protection: at the same time it could be difficult drawing the line between who is to be allowed and who should be restricted.

- At Magnet, the daily business activities are with their booking system *Super Star* which is equipped with the *Transactions Code* mechanism for handling users' rights. Considering the meagre volume of documents they do not have any problems with restrictions on users' rights.
- Users at Scandinavian Seaways have open rights to some documents while they are restricted from other documents. This form of restriction is advantageous, as there is the certainty of vulnerable documents being kept under protection.
- Handling of restrictions is a bit unusual at Scandlines. All users have *read* rights, but no one has rights to make changes in documents. This could create a few problems: for instance, if this rule is strictly adhered to, there could be several versions of the same document. Eventually, it would be a difficult task making out which version is final or up-to-date. I endeavoured to get clarification on this, but at the time of submitting this report (2003-05-20), I had not received any response for my contact at Scandlines. My assessment therefore, is based on the facts I had at my disposal.
- There is no form of restrictions at STIT – whatsoever. All users have not only access to all documents on the drive upon logging on. They also have *full rights*. There are periods when workers are engaged on temporary basis; for example on contracts and projects. Therefore, some form of restriction or other would be considered being beneficial.

7.4 Change history and updating

This is one aspect of documentation handling that seems to receive the least attention among all the companies covered in this report.

- At Magnet, no record of change history is maintained. But updating is done by the originators of the various documents in question.
- Like at Magnet, there is no record of change history at Scandinavian Seaways. But they keep track of updates, with particular attention on this being paid to their ISM documents.
- The rule at Scandlines on effecting changes in documents is very strict. However, my judgement here is an assumption based on the response I obtained. Again, request for clarification on this was not received before submitting this report.
- Change history is not observed at STIT. Updating, just as in the case of storing, is done at random with no particular structure. At times, new documents are simply

created and stored obliviously, in addition to existing ones, hence the duplication of documents in some cases.

8. Results

In the foregoing sections, I have deliberated on the problem. Now I am going to discuss the results of my analysis: and steps to be taken towards a solution.

Many a time changes in organisations occur in reckless manners, bringing negative results.

... Usually, changes occur rather too hastily focusing on technical solutions instead of understanding and diagnosing the problems first... [3]

But at STIT the leadership has taken the right step of going to the root cause of the problem, which I believe is going to pay off.

It is important to adopt a system and a set of routines that would safeguard the confidence with which the staff members are looking forward to the imminent change. This would go a long way in gaining their co-operation to work towards its success since confidence in the current system is at a very low ebb. Inducting a system and a set of routines that would not slow down the day-to-day duties of the individual member of staff is also vital here.

8.1 User requirement

Considering the nature of work, and the categories of documents at STIT, an ideal system for the management of documents should have the following qualities:

- Categorisation – the system should compel categorisation of all documents upon storage.
- Deviation from the standard should be made impossible without permission from the administrator.
- Integration of documents – it should be possible to merge documents.
- Properties like originator and updates should be required at storage.
- There should be a classified form of restrictions on altering documents, for instance, those working on project and temporary basis.

8.2 Design of system

With the types of documents and document formats handled by STIT, as discussed in section 5.1, my recommendation as to how documents should be categorised is shown in the diagram below.

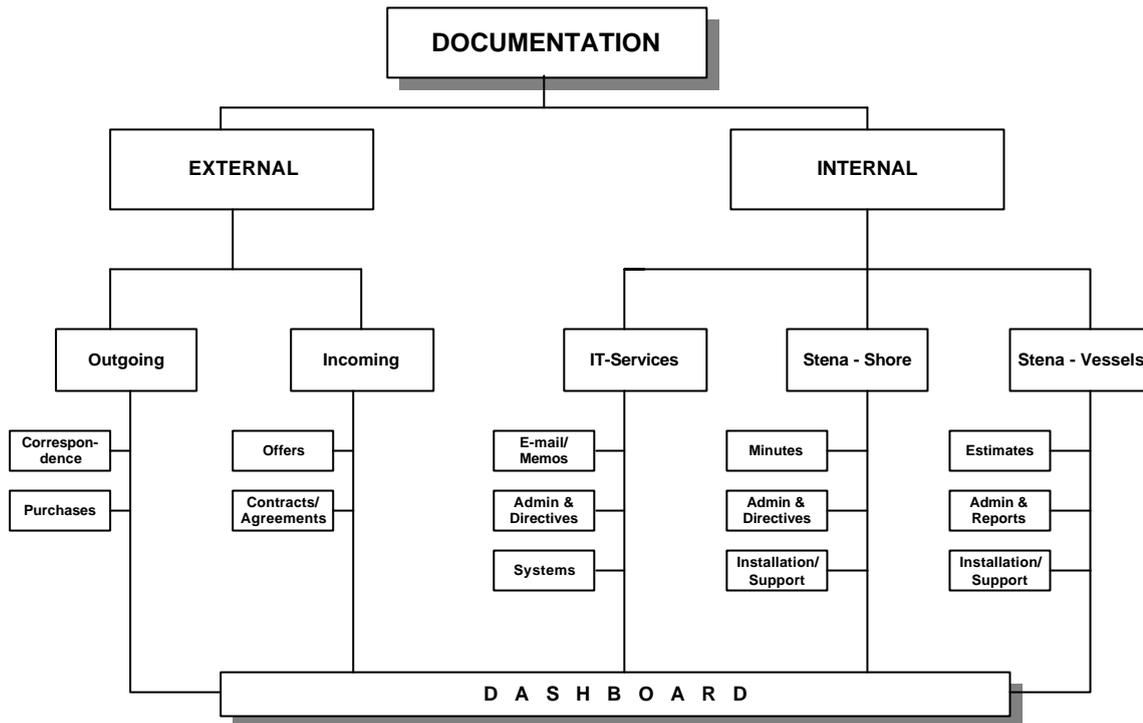


Fig. 2

This is my suggestion of how documents at STIT should be categorised.

8.3 Pros and cons of available options - tools

There are quite a few document management applications on the market. Making a choice requires taking the end-users' requirements into consideration. In this particular case, a wrong choice could result in failure to find a solution. As mentioned above, STIT is in a situation where all users are looking forward to a fruitful solution. A wrong choice could easily dampen their morale which would be detrimental to the prevailing conducive atmosphere for change.

I took a look at several of the applications available on the market today; mostly from manufacturers' and vendors' web pages. Out of those available, I took a closer look at two that I believe would be most suitable. They are: Laser Fiche and Microsoft Share Point Portal Server.

8.3.1 Laser Fiche

Laser Fiche is a company based in California in the United States. They have a product called *Laser Fiche Document Imaging & Management Platform*. The product has the properties of a good management application as discussed in section 4 of this report.

With the Laser Fiche application, documents are scanned into the system. The document imaging system stores them on the hard drive or optical disk. The documents then get indexed. When a person later wants to read a document, they use the retrieval tools available in the document imaging system. Which documents can be read and what actions performed

on these documents depend on the access provided by the document imaging system before storage.

This is how Laser Fiche describe their product...

...Document imaging builds on the strong points of paper documents: files are scanned or electronically converted and a high-resolution photocopy is stored on a hard drive or optical disk. Electronic "index cards" can attach information to a document such as author, reference number or date created. Files can still be viewed, printed, shared and stored, but imaging adds an enormous advantage by giving documents active content... [8]

On their web page Laser Fiche have an offer with a free demo version on a Compact Disk. My efforts to get this demo version did not materialise before the submission of this report.

8.3.2. Microsoft Share Point Portal Server

The second product at which I took a closer look is Microsoft Share Point Portal Server. This product has all the properties of a good management tool as described in section 4, and even more. It is my ideal document management application, and I believe it is the panacea for documentation management problems. Below is an over-view of the application's features:

It has a search engine that retrieves text using state of the art *probabilistic ranking*. The search engine also features "best bets," property searches, and it can search by text-indexing [15]

Users can subscribe to a document, folder, category, or search query so they are notified when changes are made, in the portal and optionally, by e-mail [12]

The application has an in-built customer-defined categorisation technology which automatically categorizes documents before storage. On the creation of a document, it is classified according to its contents under a set of categories before it is stored. This allows easy navigation through documents [14]

A complete set of documentation management functionality is accessible directly from the Microsoft Office 2000 toolbar and Microsoft Windows Explorer. This helps users manage documents using familiar tools [16]

The application has a *Check-in and Check-out* mechanism which ensures that only one user can make changes to a document at a time. When a user *checks-in* a changed document it is assigned a new version number and the previous version is archived. This enables optional enhanced Web folders so that documents can be reserved by individual users for updating. Document changes, including metadata such as keywords, are tracked and assigned different version numbers for auditing and rollback

With security, the application uses roles built on Microsoft Windows NT security; Share Point Portal Server ensures that only users with appropriate access can see a given document.

The Lifecycle Management feature creates private drafts, reviews and revises, and then publishes, with optional approval routing. Examples are in the images below:

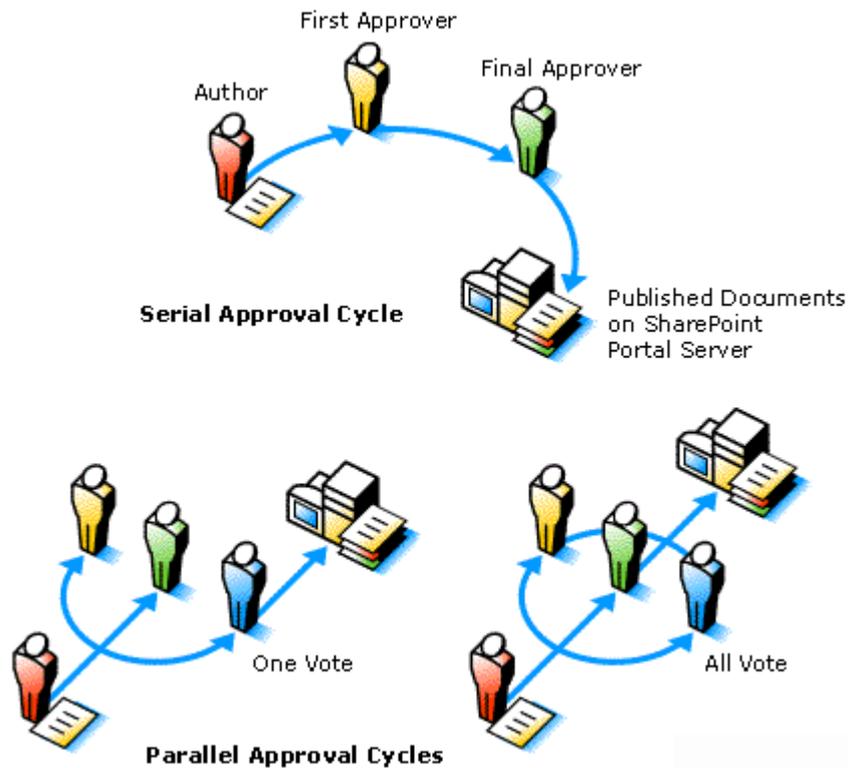


Fig. 3 (By courtesy of Microsoft, Sweden [13])

*From top and clockwise: 1. Document requiring an approval before a final approval;
2. This time more than one approval is required to get a final version.
Finally, attentions of two people are required, but only one approval is needed.*

A Document Collaboration feature uses the discussions feature in Office and Hypertext Markup Language (HTML) documents for inline content review. Besides, there are dashboards that serve as centralised access point for finding and managing information on the intranet.

The dashboards can display the various categories of documents. Through a dashboard a user can subscribe to documents that are of interest.

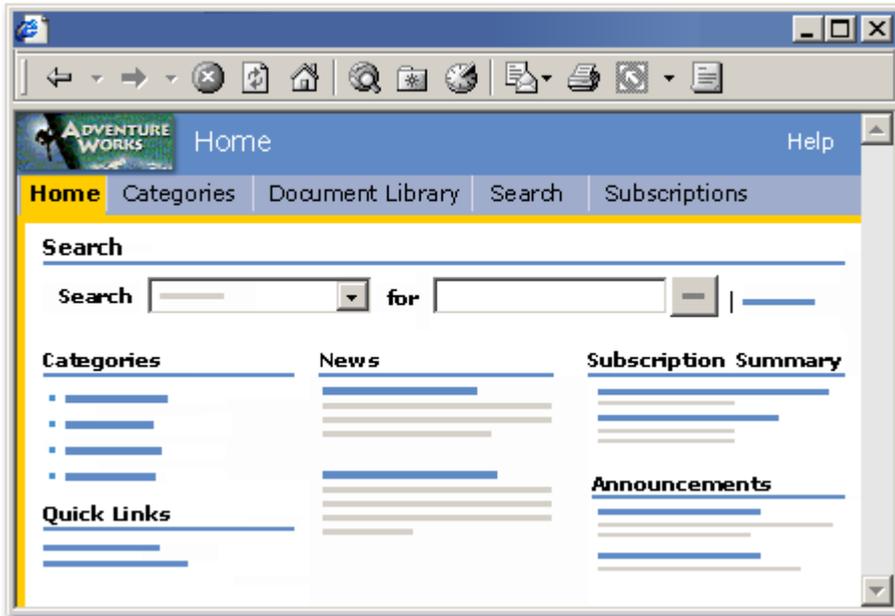


Fig. 4 (Courtesy of Microsoft, Sweden [13])

This is an image of Share Point's Dashboard showing some properties of the application.

8.4 Choice of suitable tool based on requirement

In my point of view the most suitable application that is capable of solving the current problem with document management at STIT is Microsoft Share Point Portal Server. My choice is also based on close examination of the user requirements and my insight into the flow of business activities at STIT.

9. Recommendation of routine

My interviews with some of the users at STIT gave me a first hand experience and a general view of the users' desire apart from the craving for change. Based on that experience, I would like to suggest a few measures towards routine:

- Categorisation of documents should be enforced.
- Standards are to be observed not out of choice but out of necessity.
- Instantaneous storage should be enforced in all vital documents.
- Versioning of documents that require life cycle is necessary.
- Flexibility: only when documents pertain to one user should local storage be allowed.

In addition to the recommendations above, some qualified form of restrictions on users' rights would be beneficial – especially those not on permanent employment - these employees should be given some limited permissions by the administrator.

9.1 Follow-up to introduction

As a follow-up to choosing the right management application, some input is required on the part of the users.

...To ensure that the document imaging system runs smoothly, it is important to train selected individuals on how to administer and maintain the system. On site training is recommended because it increases familiarity with specific details of the document imaging system. As with end user training, freedom from interruption is necessary... [8]

This is how Laser Fiche describe induction of a new system, to which I agree. And I believe this can apply to all new systems. Such steps enhancing smooth transition would create an 'our change' feeling among the staff at STIT, as against 'their change' feeling. It would also convince them the new era has all intentions of finding a lasting solution.

Before a new application and a set of routines are put into effect, there would be the need to discard documents that are not of use. There are a few documents in store at present that may not be required. This is to avoid over-labouring the new system that would be put into use with unnecessary documents from the very onset.

The safest way of getting rid of such documents with certainty - without risks of deleting the documents out of error - is to have them deleted by their originators. This might be time demanding initially. But in the long run the benefits would certainly out-weigh the time lost.

I would also recommend that periodic follow-up meetings by the leadership at STIT with the members of staff to discuss difficulties they might encounter be held. This could even be preceded by forming a *mini Records Management Section* to get a few individuals, or at least, one individual to serve as an Administrator of the new system during the transition period.

10. Conclusion

The revolution in information technology has taken a new turn with the turn of the last century. People are now used to fast processors – beyond the 1 Gigahertz mark, as compared to a mere 300 megahertz just about a decade ago – in their homes, at Cafés and at libraries. As such, similar performances will be more than welcome at their places of work. Besides,

...Everyone works with documents. But not everyone has the technological ability to streamline their structure to improve vital interaction with their colleagues. The process, which goes from the creation of a document to its publication on the intranet, is the result of a set of several tasks that have nothing to do with business processes... [7]

With a good set of routines, choosing the right management application would go a long way to making users more productive. Time that might have been used in organising documents – in the absence of routine and an application – would be used in performing normal duties. The users at STIT may be professionals in the field of computers, but:

...The users of information need more support in information seeking whether it is internal or external information; to take this challenge we really must be able to help the users...[6]

Analysis of Routine and Applications for Documentation Management

There are a few questions that needed more clarification, most especially, regarding the external interviews. Some of the written questions were not answered because they were misunderstood. I made attempts to get those issues clarified by writing back to those concerned. But due to their busy schedules and the time within which to submit the report of the studies, I had to base my judgement and conclusion on the information that I was able to obtain. This is an evidence of problems with written interviews discussed in section 6.

Among the four companies that I have discussed in this report, none of them is taking full advantage of the sophistication of the modern day's advancement in Information Technology, as far as documentation management is concerned. They benefit from a mere fraction of all the finesse today's applications can offer; considering the properties that I discussed in section four.

STIT would be the first among these four companies to embark upon a fully-fledged documentation management system. And I believe that in the nearest future some of these companies might turn to STIT for guidance and suggestions if they (the other companies) should embark upon a study of this nature.

The current situation at STIT might seem troublesome, but the atmosphere for change is to say the least, very conducive. The craving for change is unanimous and the willingness to contribute to all measures to be adopted by the leadership towards change - on the part of the staff members - is overwhelming. Therefore, my conclusion is that a well functioning documentation management at STIT is just one move away and it is centred on the implementation of the right application and a good set of routines.

References

- [1] Kerstin Burell, Jan-Axel Kylén, *Sju Steg Vid Utredning och Projekt. Detaljplanering av Arbetet* (1995) pp67-69.
- [2] Charles R. Hilderth, *Preserving What We Really Want to Access, the Message, Not the Medium: Challenges and Opportunity in the Digital Age* Published in *Electronic Documents and Information* (1995) pp84.
- [3] Göran Goldkuhl, Annie Röstlinger, *Förändringsanalys - Arbetsmetodik och Förhållningssätt för Goda Förändringsbeslut, Förändringsarbete - Några Erfarenheter* (1985) pp7, 8
- [4] Richard Beaza Yates, Berthier Ribeiro-Neto, *Modern Information Retrieval. Retrieval Evaluation*
<http://www.sims.berkeley.edu/~hearst/irbook/> (2003-05-05)
- [5] Microsoft, *MS Portal Share Point server 2001*, (2003-05-10)
- [6] Repo J. Aato, *Information Resources Management in the Finnish Government. Information Resource Management – Nordisk I o D Conference.* (1985) pp166
- [7] <http://www.activeservers.com/Service/virtual/Spoint.asp> (2003-05-06)
- [8] <http://www.laserfiche.com/basics/index.html> (2003-05-10)
- [9] <http://citeseer.nj.nec.com/sahami99using.html> (2003-05-12)
- [10] <http://citeseer.nj.nec.com/context/233147/0> (2003-05-12)
- [11] <http://www.microsoft.com/business/articles/dd/ddbasics.asp> (2003-05-13)
- [12] <http://www.microsoft.com/business/dd/default.asp> (2003-05-13)
- [13] <http://www.microsoft.com/sverige/permission/copyright/pictures/default.aspx>
(2003-05-12)
- [14] <http://www.microsoft.com/sharepoint/portalserver.asp> (2003-05-14)
- [15] http://www.mstp.quantico.usmc.mil/classes/CollabSol/MsPortalServer/sharePortalServer_files/frame.htm (2003-05-15)
- [16] <http://www.sims.berkeley.edu/~hearst/irbook/> (2003-05-16)

Appendix A: Questions for internal interviews

1. How do you access the drive for *infrastructure*?
2. Do you have access to all the folders upon logging on?
3. Which of the folders do you mostly use for your documents?
4. How do you file your documents? Do you observe some routine?
5. How do you update your documents?
6. How do you locate your stored documents?
7. What difficulties do you have in retrieving your stored documents?
8. What difficulties do you face, if any, in retrieving other people's documents?
9. Do you have any special wishes for improvement, or for a new document management application and routine?
10. What knowledge of databases do you (Just considering what might be recommended for later use.)

Appendix B: Interviewees - internal

- | | |
|---------------------|---|
| 1. Niclas Ingeström | Head of department |
| 2. Jörgen Lisborg | Head of systems |
| 3. Gunnar Ulström | Head of network section |
| 4. Jan Hedenskog | Field Technician |
| 5. Stefan Begic | Head of Telephone/Satellites Switchboards |
| 6. Anders Wallin | Helpdesk |

Appendix C: Questions for external interviews

1. How do you categorize your documents, generally?
2. How do you handle updating documents?
3. Do you manage your documents with a database application?
4. What rights do users have in accessing documents (e.g. read, write)?
5. Do you or any of your staff members have any difficulties in retrieving stored documents?
6. Have you ever tried a method whereby administering documents is assigned to a particular person?
7. We have a situation whereby documentation has been neglected, and in some cases documents are not up-to-date. What routine or application would you recommend for documentation management?