

Project Report

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1. Introduction

There are countless ways to put together an information system, but finding a good method to do so is not easy. It is this project's ultimate goal is to find such information and build a good system template. (Please see previous reports for detailed project objectives)

I have been researching for information which might be useful for the project, and in this report I will be discussing the various resources which I have consulted, followed by some comments on the overall findings and conclusion.

2. Aim

The aim of this research is to find any information that will be useful in building a high quality enterprise level information system. This can be any methods, techniques, studies and etc.

Specifically I was looking for the following information:

- Anything to approve/disprove the model from visualization (see previous work)
- How to connect together the different offices
- How much bandwidth is required for a typical company
- How to maintain a high service availability of the system
- How to set up a fault tolerant local area network
- How to quickly recover from system failures
- What are the options available for working remotely

One thing to note is that the information needs to be practical and readily usable, not some abstract theory or concept which lacks commercial implementation.

3. Method

The most significant resource which I have consulted is the IEEE Xplore database (<http://ieeexplore.ieee.org>). It is the world's largest technical literature repository in electrical engineering, computer science and electronics with almost 1.4 million documents available online. Access is granted through the University's subscription.

The search is keyword based; I have used many combinations of keywords and phrases, such as "system integration", "information system", "high availability", "disaster recovery" and many other variations.

One single search usually yields many results. I look at the results and their descriptions then download the ones that appear promising. I then review them in detail when I have time.

I have also looked at some University courses and how they're related (if in any way) to the project and general system integration.

4. Review of Technical Papers

In this section I will review the technical papers that appear to be interesting from my search in the IEEE database. Please refer to the Reference section of this report for detailed bibliography information.

4.1 *Aspects of System Integration*

This paper describes some high level concepts of system integration; it states that system integration has four main aspects (areas): Integration technology, Integration architecture, Semantic integration, and User integration. However this paper is quite old (published in 1990) and the concepts are too abstract for any practical use.

4.2 *Maintaining a secure networking infrastructure*

This paper offers (as it states in its abstract) to provide "common security trends" and "solutions for building a high-availability secure networks". However, it is really short and merely touches the surface of the subject. It starts with an overview of the "current" (2002) state of internet security with some figures which I believe is long outdated by now, and then basically just tells the reader to follow some standards like IEEE 802.1X. It does not actually provide any evidence or reference to any other sources to persuade the reader what it has stated is actually good in real-life situations, and in one place, the author even tried to lure people to use his company's products.

4.3 *Making the gigabit IPsec VPN architecture secure*

This paper describes several ways to secure a Virtual Private Network (VPN), its ideas seem to be very good and it's featured in IEEE Computer Society's *Computer* magazine. However the information it provided is conceptual, yet to be commercially implemented and proven.

4.4 *Design of a dual-computer cluster system and availability evaluation*

This paper offers some new concept to building a highly available Network Attached Storage (NAS) system, however it is very much theoretical and there are no commercial implantations in the market.

4.5 *High availability path design in ring-based optimal networks*

At the first glance this papers seems to offer information to provide ways to build a company network with availability in mind. However after examining it in detail, the paper is actually focused on large networks, such as an ISP, and has no use for this project.

4.6 *Architectural design and implementation of highly available and scalable medical system with IBM Websphere middleware*

When I first look at this paper, I was hoping to find some general information on how to build a highly available computer system. However, after reading it, I find it to be too focused on the equipments (such as IBM Websphere) it was using, and cannot really be put into general use.

Remarks

I have also looked at some other papers, but overall they can be categorized into one of the following:

- The paper is too abstract and no commercial implementation is available, or
- The paper does not suggest anything helpful or provide any good sources, or
- The paper does not focus on what we need.

5. Review of University Courses

In this section I will look at the two courses that seem to be closely related to the project. To provide an understanding of what is typically taught, I have listed some papers which a final-year student would usually take.

5.1 Information Technology, Bachelor of Technology

This degree is offered by the Faculty of Science. Although the name of this degree is "Information Technology", it is not as general as it seems. The degree focuses mostly on programming, with a few papers from Information Systems such as database management.

Some typical final-year courses include:

- COMPSI 711: Parallel and Distributed Computing
- COMPSI 720: Advanced Design and Analysis of Algorithms
- COMPSI 725: Software Security
- COMPSI 742: Data Communications and Networks
- COMPSI 760: Datamining and Machine Learning

5.2 Information System, Bachelor of Commerce/Science

This degree is offered by the Faculty of Business and Economics, but can also be taken as a Bachelor of Science degree. This degree deals with the practical and theoretical problems of providing information to an organization using computer systems, both applied the theoretical.

Some typical final-year courses include:

- INFOSYS 320: Systems Analysis and Design
- INFOSYS 321: Enterprise Systems
- INFOSYS 329: Advanced Data Communications
- INFOSYS 330: Advanced Database Systems
- INFOSYS 339: Computer Networks

Remarks

It would appear that Information System is more directly related to system integration. However when I asked one of my friend who is doing the degree about the topics of the project (such as building a high availability network) she said that she doesn't really have any idea either. I think

we can conclude that the university degree is not very practical, and it's also why work experience is important.

6. Conclusion

From my research, I was not able to find any real practical information that can be used for the project at all. One thing to note is that the IEEE Xplore database is really large, so the information we want might be somewhere in there, just hard to find. Anyone who have used IEEE's search engine would tend to agree that it just throws back too much results.

The courses I have taken in Information Technology do not help the situation at all, since we did not really learn anything about system integration. For future projects, I would recommend that the supervisor find something which is more closely related to the degree, more programming based. Things like developing a software system. Such project would benefit more from what is taught in the degree, and put the student's skill into use (also reduces the student's frustration).

7. References

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September 14, 2006