Strategic Plan for the IT Committee

Erik Ernst & Søren Ertmann
Department of Computer Science
University of Aarhus
Aabogade 34, DK-8200 Århus, Denmark

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Abstract

This document is the strategic plan for the IT Committee of the Department of Computer Science at the University of Aarhus, Denmark. It will be revised if and when the need arises.

1 Introduction

Strategic plans commonly include a number of standardized elements intended to help characterizing the organization in focus and outlining the direction in which this organization is moving in the medium to long term. These standard elements are addressed in relation to the IT Committee at DAIMI in the following.

Vision: We will develop and maintain a high quality information and communication technology (ICT) infrastructure for DAIMI and other collaborators, while ensuring good working conditions for the members of the IT staff, and a good and constructive atmosphere in the collaboration with other organizations. Moreover, we will maintain a good balance between in-house tasks and out-sourcing; between face-to-face problem solving in the daily work and more static approaches such as "HOWTO" web pages; and between development of new solutions and establishing efficient standard routines for daily chores.

Mission: To manage strategic planning and daily operations of the department's computer facilities for education, research, and administration; to manage the human resource issues concerning staff members; and finally to manage the collaboration with external entities in relation to these issues.

Values: High quality in the ICT infrastructure amounts to high availability of services offered, and a high degree of correctness in the performance of these services, as well as an effective operation such that they do not consume too many resources, including working hours. Good working conditions depend on the views and expectations of the staff members, but it generally includes an open-minded and collaborative approach, and a fair amount of opportunities for each staff member to influence one's own situation and develop in new directions. Good collaboration with other organizations is characterized by a high level of trust among the collaborators, an uncomplicated yet effective style of interaction in the daily

work, and the ability to see opportunities or required changes and acting upon them in a timely manner.

Objectives: To maintain the high quality of existing services, and updating them or building new services in a way which provides good and relevant functionality, while ensuring that the resulting workload is reasonable and working conditions good. To establish an overall understanding of the future conditions for the work of this committee—including relevant developments at the level of the university or the Faculty of Natural Sciences—in order to act upon such developments proactively rather than getting caught on the wrong leg when it has already happened. In order to achieve these objectives, the following conditions should be taken into account:

Strengths: A broad and deep skill-set among staff members, and a tradition to solve problems and establish solutions in an innovative, yet robust and realistic manner. A very good track record with respect to the correctness and availability of various services offered to DAIMI and others. A good, collaborative atmosphere in the daily work. Possibilities for members of the IT staff to change their job profile over time. Good integration with the rest of DAIMI, including personal acquaintance built through daily ad-hoc technical support and through the inclusion of student programmers in the staff. Experience in the area of collaboration with other organizational units, as well as a number of established, good relationships with those other organizational units.

Weaknesses: Lack of funding to compete with private companies in relation to expensive skill-sets. Possibly a certain lack of flexibility in the organization of the daily work, based on a long time development of roles and skill-sets under conditions that were in many ways different from today's conditions and the expected future developments. The opposite problem must be considered, too: As the job profile of members of the IT staff develops, a good balance must be maintained, e.g., when certain functions are understaffed because the people who did this are now doing other things. Finally, we probably have a tendency to approach new tasks and situations without explicitly painting the big picture and making appropriate decisions explicitly.

Opportunities: An expansion of services offered to other organizational units, selected and organized such that the amount of extra work for each extra person receiving this service is kept well under control. A development among staff members of new skills and roles, and an adjustment of the overall organization of the work in a direction that promotes a good working environment and a flexible and effective organization of the daily work.

Threats: Creating or accepting too many obligations toward other organizational units, resulting in chaos, frustrations, or excessive workload. Having collaboration relations where the ownership to hardware and/or software and responsibilities is unclear, or otherwise such that our staff cannot solve upcoming problems because of a lack of knowledge or privileges.

This outlines the strategic landscape around the IT Committee in rather general terms. The following sections give more specific information about the current situation and some pointers toward likely or desirable future developments.

2 Strategic Areas

The main subject areas covered by the IT Committee are hardware, software services, collaboration with other organizational units, and human resources. In general, we are moving in the direction of a larger scope for many services. This is the case with wireless networking which is handled by the University of Aarhus globally, and it is the case with a number of services which are delivered by the Faculty of Natural Science (NFIT). NFIT buys those services from us in a number of cases because we are in a position to deliver them in good quality and with a good resource economy. Similarly, we also deliver a number of services elsewhere and the collaboration has been formalized in terms of contracts between DAIMI and some other institutes and similar organizational units. This development is likely to continue. The approach supports many users and/or systems in a rational and systematic way because of various benefits of scale including sublinear effort increases and opportunities for developing more specialized skills. This might in term enable an improved service in some of the more specialized areas, such as ad-hoc support for users in general (a 'help desk'), MacOS support, NFIT projects, etc.

3 Hardware

Workplaces are supported by many different kinds of hardware, but hardware from specialized vendors such as Sun, and SGI have been converted to commodity hardware ("PCs"). Similarly, server hardware is also following the main stream (using Intel or similar processors), with HP, IBM, or Dell as typical suppliers. Using commodity hardware ensures lower prices while maintaining reasonable quality standards, and also enables a more flexible reassignment of existing hardware to be used in a new way.

In general, employee workplace hardware tends to become portable, and laptops from Apple are playing an increasingly important role here, though sometimes running other operating systems than MacOS.

There is an ongoing process of reducing the number of computers which are available publically, physically and with respect to login, i.e., such that anybody who has a DAIMI login account can use it. In return for this reduction of service in terms of public hardware, some other services are enhanced. In particular, WiFi access has been made more flexible and moved to the university level, wired network access in public areas has been enhanced, and the number of tables in public areas also increases. It is reasonable to expect a certain shift from DAIMI host maintenance to user support, because a larger proportion of the users maintain their own machines. Another likely consequence of this shift is that the physical layout of offices will be adjusted such that access to power and free desktop space gets higher priority, and deployment of storage lockers for students without office space may be considered. It is even possible that student office space can be reduced slightly in order to be able to offer office space to more students, because laptops take up less space.

Some categories of public computers will still exist, especially those machines which are equipped with specialized hardware (e.g., for advanced graphics applications).

Moreover, a number of publically accessible computational servers (such as the so-called "horse farm" and similar clusters) are available. This helps to compensate for the relatively poor processor power of older DAIMI computers installed in students' offices, and it also enables users of private laptops to run software on a standardized

DAIMI software and hardware platform. This service will be maintained and possibly enhanced.

We consider creating some statistics about the actual use of private laptops, based on polls among students on the dIntProg course or in similar contexts. This should be used to support the decisions made with respect to the issues around the public computer policy.

The organization of printing services is being considered, and there are plans to experiment with the payment required by students for printing. It is possible that this payment requirement will be removed, and also that the physical placement of the printers and the choice of printer models will be changed as part of the same reform.

We plan to make more explicit estimates of the need for resources over a medium time range such as 2-5 years. For example, we may use this to discover in time that there will be a need for an enhancement of the server room capacity, cooling, UPS, etc. Predictions of future needs with respect to hardware should be used to create a rough plan of investments for a few years into the future.

Finally, there are requests for the Windows operating system on students' workplaces, and now and then also for more powerful compute servers running Windows. These requests will be considered. They will be granted to the extent that it is compatible with the relevant overall policies, including policies about security and virus protection.

4 Software Services

We expect an increase in the need for support of personal laptops. Similarly, there may be an increase in the need for user support in connection with NFIT activities. We should consider establishing a help desk in order to be able to provide this kind of user support in a systematic and effective manner. One consideration which plays a role here is that it becomes more and more important to be able to help remote users as well as local users, because of the increasing level of collaboration with other organizations.

Part of the software maintenance work can be handed over to users who have a special interest in using this software, e.g., the very newest version of Emacs. This is done by introducing the notion of user controlled installations; the trade-off is such that these users—and others with them—get access to more frequent updates and a larger number of installed software packages, in return for having to perform and maintain this installation themselves. This initiative has been running for some time, but has not yet been used very much.

Efforts to control power consumption is likely to become an integrated part of the software service structure, and it is expected that computers will be turned off during low-intensity hours (at night) and maintenance will use WoL (Wakeup on LAN activity) to operate on such machines.

In general, we have maintained the policy that users themselves are responsible for learning about the applications they are using and solving problems with this usage. E.g., it is not the job of the IT staff to help making Microsoft Word reformat a table in a particular way. An exception to this rule is that application support *is* offered to the administative personnel. It is a topic of frequent debate exactly where to put the borderline between support which is offered generally and support which is considered as application support and consequently off-loaded to users.

We aim at reducing the number of supported operating systems and focusing on the remaining ones, currently as follows:

- For clients:
  - Fedora → RedHat Workstation
  - WindowsXP → Windows Vista
  - MacOS X
- For servers:
  - Windows
  - RedHat Server

We plan to create more specific rules for the lifetime of a login account. Forcing users to change their password, e.g., twice a year, would help making it visible which accounts are not being used, and this could be used to clean up the set of accounts. Similarly, we plan to decide on rules for how and when to delete user files or web pages belonging to users who are no more at the university, in collaboration with the Web Committee.

Finally, we have moved a number of services to an NFIT setting, and more will follow.

5 Collaboration

In general collaboration exists between DAIMI and all the associated projects.

A more formalized kind of collaboration exists in relation to several external organizational units, expressed in terms of a collaboration contract:

- **Alexandra.** All IT services except external systems (Navison, SPS). To some extent support of Alexandra project hotel users.
- **Institute of Geology.** They use as many as possible from our palette of services, but user support and other things are done by themselves.
- **Department of Sport Science.** They are in the process of remodeling their daily operations to use our services, the rest is handled locally. The contract is being renegotiated during the spring 2008.
- **Aarhus Graduate School of Engineering (AGSE)** Collaboration with AGSE is being initiated, and it may at this point be handled as a subsidiary of the collaboration with the Department of Sports Science.
- **Bioinformatics Research Center (BiRC)** Collaboration with BiRC has been taking place informally for years, and it is currently being defined more rigorously through a collaboration contract.
- **Department of Science Studies** Collaboration with this department is being initiated, and a collaboration contract will be written.
- **NFIT** Under this umbrella we participate, using several services and also providing several of these services for existing or future collaborators.

In general we aim to collaborate in such a way that we offer services of the same kind and at the same level as those which are offered at DAIMI. This is a rational approach both for us and for the external partner, because we can obtain benefits of scale such that we may offer these services at a good price for the partner without putting more resources into it than we receive in compensation.

One consideration to make in this context is that we should not allow our external services to grow in such a way or to such an extent that we get overloaded by the work. In particular, offering services to external partners should result in a sublinear increase in resource utilization (so we can help x% more people with a particular service by adding less than x% more work hours). A case where this principle is endangered is when a greatly increased geographic work area causes a lot of extra working time spent on transport, and this means that we must organize the work in such a way that most services can be provided entirely from DAIMI, rather than by physically going to the other institutes etc.

6 Human Resources

We are planning to gradually change the nature of the work by people whose responsibilities used to be purely hardware based, such that they participate in some software tasks, especially in connection with networking and Windows administration. There will be a need for some supplementary unskilled staff in connection with larger tasks (moving offices, buying a large amount of new hardware, etc.)

Given that personal user contact should be possible during normal working hours and based on the nature of the work, we have decided on the policy that working from home should only occur rarely. In general, we aim at having robust systems and services, such that smaller hardware breakdowns only interrupt few operations and services, if any.

Monitoring of daily operations and scripting of most routine tasks is used in order to reduce the amount of manual work in the daily routines.

The compensation paid by other organizational units such as NFIT and Geology as part of the collaboration has enabled us to hire extra people. This effect is a crucial part of the strategy of offering services to other organizational units, because it is needed in order to compensate for the increasing workload due to the services delivered externally.

7 Operational Reliability

We intend to maintain high reliability in the delivery of services, both with respect to the availability of the services and the correctness of actions performed by these services. However, it is not a 24/7 effort since nobody is paid to monitor and maintain systems outside the daily working hours.

Problems discovered in the evening or during weekends or holidays are often solved very quickly by staff members who happen to notice the problem, but we cannot *promise* that any actions will be taken before the next work day.

We plan to quantify the standards with respect to reestablishment of each particular service, in the form of a rule specifying how many days or hours we expect the service to be absent in case of a very serious breakdown.

For example, it might be expected that a total breakdown in a file server would make the corresponding files unavailable for 4 days. Of course, the vast majority of file server related problems would be solved much faster than that, but a total breakdown does give rise to a lot of work.

The purpose of having this quantification is to inform users and staff of the perceived graveness of a set of important failure scenarios, which would also work as a guideline for decisions about which level of redundancy and other failure prevention techniques we need to apply.

The list of services currently in focus is as follows:

- Mail
- Web
- File servers
- Calendar
- Printing

An important part of operational reliability is information security, which includes protection against unauthorized access to or modification of systems and data. The document DS484 defines the information security standard which is the obligatory basis for all governmental institutions in Denmark in the area of information security. This standard is being implemented in a separate process. The chancellor of the University of Aarhus has formed a committee, the Information Security Committee (Informationssikkerhedsudvalget) which consists of representatives from all faculties as well as some representatives from the university administration. This committee will produce an information security manual (It-Sikkerhedshåndbog) which defines how to implement DS484 at the University of Aarhus.

8 Conclusion

This document contains the strategic plan for the IT Committee at DAIMI, first at a general level and considering the standard subjects of a strategic plan, then at a more specific level for the various strategic areas.