
Staff edutainment on a corporate intranet – lessons learned

Vlad Ionesco

Royal Institute of Technology, Stockholm, Sweden, email: vlad@gt.kth.se

This paper discusses the results from a case study of an intranet-based staff education programme at the national Swedish telecommunications corporation. The programme attempts to convey the environmental benefits of telecommunication services, aiming at increased staff awareness and new business opportunities. A multidisciplinary production team packaged the factual content in a rich mixture of audio and video clips, text, images, animations, quizzes, games, tests and polls. A standard Web browser with downloadable plug-ins is used to view the material. The self-paced studies on the intranet are followed by a seminar, combining the advantages of individual and teacher-assisted education. The impact of the programme has been studied partly through a questionnaire distributed to a number of users, and partly through interviews. The results show that intranet-based 'edutainment' is a practicable and successful tool for organizational learning. Ease of use, interactivity, ease of distribution and renewal, flexibility in time and space, are just some of the benefits offered. However, a number of pedagogical, organizational and technical requirements must be met in order to succeed. Context, pedagogical aims and standards, content, information structure, user characteristics, management commitment, technical platform, media types, the production team, user interface and user tests are just a few of the important factors that must be considered. This paper attempts to identify some of the factors essential to successful staff education on the corporate intranet, discussing observations and lessons learned from the case study.

Web-based learning

The educational level required of a successful member of today's society and working environments is becoming higher and higher. National and commercial education systems are struggling, as increasing numbers of people must be trained within harsh budget constraints. In this context, internet technology has emerged as a new tool in the field of education and training, and the number of applications of this technology is increasing steadily. In order to assess its full potential, it is important to study cases in both educational and business settings.

The foremost advantage of internet technology is ease of distribution. Once a Web-site is launched, the material can be accessed by an audience of any size without dramatic cost

increases, as no physical objects need be distributed. Another advantage is ease of maintenance. Changes in online material take effect instantly, compared with the much longer revision cycles of, say, printed material. Online material can thus be kept up-to-date with reasonably little effort. A third advantage is ease of use, as the Web interface is familiar to an increasingly large number of people, both at home and in the working environment. Convenience is also an advantage. Students are no longer constrained in time or space. They can study at a time and place of their own choice, as long as a computer and the network are available.

However, online learning also has some disadvantages. Firstly, technology evolves very rapidly, making it difficult to create long-term, stable and flexible applications. Secondly, it is difficult to cater for students' different learning styles. Online material must be carefully structured, in order to offer the advantage of non-linearity without creating confusion. Studies show that information structure has significant influence on learning performance (Quentin-Baxter, 1998; Paolucci, 1998). Thirdly, an increased burden of responsibility is placed on the students. They often have to study individually, without motivational support from fellow students, and with delayed support and feedback.

Despite these disadvantages, Web-based learning may still be the answer to the increased educational needs of today. Technology is still in its infancy, and further research and development will most likely lead to better results. The purpose of this paper is to describe the experiences from a multimedia staff education programme on the intranet of the Swedish telecommunications corporation Telia, and to discuss some factors that have been found important.

Telia Corporation

The Swedish telecommunications corporation Telia has approximately 26,000 employees. Their mission statement is to 'enhance the quality of life, the environment and the competitive ability of individuals and organizations by bringing them together with easy-to-use telecom-based information services' (Telia, 1998a). Telia's ambitious environmental programme has been in progress for many years. Apart from aiming at running its own business in an environmentally friendly way through the choice of materials and procedures, Telia's ambition is to 'help its customers adapt their operations to environmental demands and demonstrate the environmental advantages of telecommunications' (Telia, 1998b).

In the light of this policy, Telia decided to develop an educational programme for all employees. The goal of the programme is to increase awareness of the company's environmental policy, and of the environmental benefits of telecommunication services, hoping to motivate the staff both at work and at home. For instance, using phones, email, electronic commerce and digital documents can reduce transport and thus pollution. The decision was made to deploy the education programme on Telia's intranet, in order to illustrate these benefits, and also to use and evaluate the latest technology available.

The education programme

The education programme consists of two parts: (i) the multimedia material on the intranet, which each employee goes through individually, and (ii) a subsequent traditional seminar, led by an expert on environmental issues. The seminar is meant to offer employees an opportunity to discuss issues with one another, ask questions and share ideas. A comprehensive description of the programme can be found in Ionesco (1998).

The online material contains a large amount of facts and figures about the environment, related both to the company's business activities and to individual behaviour at work and home. The aim is to highlight the environmental benefits of telecommunications products and services, to arouse a sense of involvement in the employees and, in the long run, to create new business opportunities. In order to attract and retain the users' interest it was decided to give the website an informative, and yet entertaining profile. The decision was made to create an 'edutainment site', in which educational objectives can be realized in an entertaining manner.

Several of the technologies available on the Web today have been used to present the information. Frames, simple HTML and JavaScript code, a mixture of GIF and JPEG images, *Shockwave* and *Flash* animations, streamed *RealMedia* audio and video files, all contribute to a rich and varied design. Further, a number of CGI-scripts are used for the navigation system, and to create games, polls, quizzes and tests.

To facilitate navigation within the online material, the information has been divided into modules. The metaphor underlying the top level of the information structure is that of a city, with different areas and buildings, each linked to a module with a specific topic. All the modules have a similar tree structure, with a summary describing the module, a main scene (possibly made up from a chain of Web pages) conveying the message, a list of internal links to relevant products and services, and a list of external links to successful implementations of the module topic. The current position in the information structure is always indicated on the Web and a short cut to the top level of the module is always present. A menu with short cuts to all the modules is located on the side of the screen, and it also indicates which modules have been visited by the user. This, of course, requires users to register the first time they enter the site, and then to log in for every new session. The individual progress of each user is saved on the server, enabling access from any computer on the network.

The site contains a glossary covering most of the terminology used on the site. Links to individual entries are abundant throughout the material, but the glossary can also be used as a separate module for browsing through all the entries. Some entries are only short descriptions, while others consist of longer articles and images. A proposal box on the site provides everyone with the opportunity to submit comments and suggestions to the educators and to the staff responsible for the environmental programme.

Implementation

Some implementation issues will be briefly discussed here. For a more detailed discussion, see Jonsson (1998).

The production process was initiated by the environmental department at Telia. Business and learning goals were carefully defined and a specification was written. A virtual organization spanning over several smaller firms and consultants was formed, as no single company was found to have all the expertise required. The project team consisted of managers, environmental experts, content creators, Web designers, artists, audio and video experts, and programmers.

Managing and co-ordinating a project team of such diversity can be a challenge. The terminology used by the different professionals differs, and insight into the practical limitations of others' domains is sometimes insufficient. It is of little use, for instance, when the design team thinks of a fanciful animation, if it cannot be implemented by the programming team.

After a few such failures, co-operation was improved by enforcing a feedback mechanism, as well as detailed sub-goals, schedules and deadlines for all involved. Form and content were given equal importance, taking cost, time and effort into consideration.

The information content was structured and subdivided into modules, and scripts were written for each module. Based on the script and on practical technical and economic considerations, different types of multimedia objects were developed for each module. A user-friendly interface was outlined and tested in co-operation with a sample of representative users. Templates were developed to simplify the coding stage and to ensure consistency. As the project proceeded, user tests were performed regularly, applying iterative design until the final stage.

Method

In the summer of 1998, six months after the initial installation, the programme was subject to a survey, partly based on the methodology described by Maxwell (1996). The aim was to find both quantitative and qualitative measures of its outcome, and to identify critical factors.

Eighty-seven users were selected from the log files on the server and were asked to fill in a Web-based questionnaire, containing both open and closed questions. Forty-seven answers were received. The selection process was not entirely random, since email addresses were difficult to find for all users. In-depth interviews were carried out with a manager, a developer and two users. Minutes from user tests during the implementation phase have also been used as data for this paper.

The methodologies proposed by Quentin-Baxter and Dewhurst (1992) or Yildiz and Atkins (1993) would have provided more data for the study. However, their level of detail is more suitable for fundamental research, and they could not be applied in this project due to limited resources.

Results

Low penetration

During the first six months, 360 new users registered on the site, of which 150 completed the entire programme. The low penetration is accounted for by three factors.

First, the programme is not compulsory. In the future, all Telia employees will go through the programme, but for the moment it is voluntary. In today's stressed working situation it is difficult to motivate staff to find the three to four hours necessary to go through the material.

Second, difficulties with browser plug-ins on client computers were not resolved in time. Normally at Telia, installation and upgrading of software on desktop computers is handled remotely and automatically, at night, from a central server. Thus, all computers have correct installations of the latest software version. Productivity losses are avoided, and maintenance costs, which otherwise constitute a large part of the total cost of ownership for computer systems (Gartner, 1994), are kept at a minimum.

However, because of licence fees, some of the required browser plug-ins were not installed on all computers. Instead, new users had the option to go through an introductory module. This module not only explains various features of the site, but also performs tests on the client computer in order to determine if the necessary plug-ins are present. If this is not the case, the

user receives installation instructions. However, this proved too difficult an obstacle to users without a technical background.

Finally, the programme was not properly advertised on Telia's internal information channels, many potential users remaining unaware of its existence.

To improve user participation, Telia took several measures. The required plug-ins were incorporated in the automated software installation scheme. Heavy advertising on the intranet will bring people's attention to the project. A contest with attractive prizes will hopefully be a sufficient incentive to complete the programme.

High appreciation

The low penetration is paired with high appreciation, as user reactions have been very positive. For instance, 97 per cent of the users in the survey rated the overall impression of the site as 'good' or 'very good', 98 per cent appreciated the mixture of media types, and all users found this instance of edutainment superior to, say, a traditional booklet. Even if the users having completed the programme so far are lead users, with a special interest in environmental issues, the figures are still very encouraging.

The interviews and answers to the open questions in the questionnaire also indicate that users found the site refreshing and inspiring. The varied media types conveyed the information and the underlying message, while retaining their interest. Several users explicitly mentioned that the programme did not suffer from the kindergarten pace and mentality present in some other multimedia applications.

The information content was perceived as useful and relevant by 96 per cent of the users. Still, some users demanded a closer connection to their respective business areas, while others found the material too wordy, arguing that the three to four hours necessary to go through it are too many. Either way the content is balanced, it will be difficult to find a solution that satisfies each and everyone. The best one can hope for is a reasonable compromise.

The user interface was perceived as functional and easy to use, consistency and simplicity being identified as two key factors. Navigation through the material was well supported, as the current location was always indicated together with clearly marked links. The introductory module contributed to the success, explaining various features of the site in detail, and giving the user a feeling of what to expect and how to act. An interesting point to note is that while the glossary was extensively used, the annotation tool was only used by a handful of users. Apparently it added no value, and scribbling on a piece of paper was found superior.

Lessons learned

During the survey process, it became increasingly obvious that it would have been useful to establish clear and measurable goals at the beginning of the project. However, the goal is not only immediate and cognitive, but also long-term and behavioural, making it difficult both to define and to achieve.

An evaluation module should also have been incorporated in the on-line material, as immediate feedback from the users is more valuable than delayed feedback. Better identification of users and logging of user behaviour should have been implemented, in order to find out which tools are used, how often, and which parts of the programme are in most need of improvement.

As contact among students, and between students and educators enhances the learning process, communication should be improved, for instance by using listservs and newsgroups (Gibson and Rutherford, 1998). In the programme, only a simple email function was present in the navigation toolbar, meant to be used to submit questions and feedback to the educators. However, this was seldom used, and no interaction took place until the seminar.

As Telia relies heavily on its intranet for the information dissemination, most office workers regard themselves as experienced Web users (88 per cent in the survey), and have their own desktop computers. Still, user tests revealed that users have no in-depth understanding of how browsers and the Web work. A simple and user-friendly interface is thus of utmost importance, especially as the long-term goal is to let all Telia's employees go through the programme, not only the office workers. Users should not be expected to install any software without the help of the support department. The best solution is automated centralized installation.

Management commitment is just as important as implementation issues. Users must feel that there is a purpose with the programme, that it is not just a fad, or mere empty words. Different projects and a high workload all compete for employees' time. To avoid conflicts of interest, priorities must be clarified and time must be allocated for education. Follow-up and continuous updates must be undertaken to maintain credibility.

The main technological difficulties were caused by somewhat capricious plug-ins, behaving differently in different browsers and on different platforms. Unfortunately, plug-ins are essential if the site is to contain more than simple text. Thus, it is important to specify exactly what hard- and software is going to be used, and to perform extensive testing before the material is released. The negotiation and co-ordination required between the subsidiary IT departments of a large corporation such as Telia can be an unwieldy process.

The corporate intranet offers a more stable environment and higher capacity than the Internet. Still, bandwidth proved to be an area of concern, as users in remote geographical locations complained of excessive download times. Possible solutions are proxy servers, improved infrastructure, and optimization and compression of the multimedia objects.

In conclusion, the Telia case indicates that a multimedia staff education programme on the intranet is indeed a viable and successful solution, being appreciated by the users, and offering several advantages. Hopefully, the concept can be further improved, based on the observations presented in this paper.

References

- Gartner (1994), *The Cost of LAN Computing: A Working Model*, Gartner Group Inc.
- Gibson, J. and Rutherford, P. (1998), 'Learners are teachers too in our virtual classroom', *Proceedings of the Seventh International WWW Conference*, 718-20.
- Ionesco, V. (1998), 'Edutainment on the intranet', *Proceedings of European Multimedia, Microprocessor Systems and Electronic Commerce Conference*, 339-46.
- Jonsson, A. (1998), 'Producing distributed education for the corporate intranet', *Proceedings of European Multimedia, Microprocessor Systems and Electronic Commerce Conference*, 294-300.

Maxwell, J. (1996), *Qualitative Research Design – An Iterative Approach*, London: Sage Publications.

Paolucci, R. (1998), 'The effects of cognitive style and knowledge structure on performance using a hypermedia learning system', *Journal of Educational Multimedia and Hypermedia*, 7 (2), 123–50.

Quentin-Baxter, M. (1998), 'Hypermedia learning environments limit access to information', *Proceedings of the Seventh International WWW Conference*, 587–90.

Quentin-Baxter, M. and Dewhurst, D. (1992), 'A method for evaluating the efficiency of presenting information in a hypermedia environment', *Computers and Education*, 18, 178–82.

Telia (1998a), 'Telia business concept', http://www.telia.se/index_en.html.

Telia (1998b), 'Telia environmental policy', <http://han16ns.telia.se/Telia/Thk/ThkJef01.nsf/DocKey/Environment96EN06>.

Yildiz, R. and Atkins, M. J. (1993), 'Evaluating multimedia applications', *Computers and Education*, 21 (1), 133–9.