PROJECT DESCRIPTION

An Investigation of Citizen ICT Safety and Security Awareness
"CIT-AWARE"

The goal of this project is to perform an in-depth investigation of the level of awareness of critical ICT security issues among Danish citizens, in order to expose areas at which new technical efforts or attempts to increase people's understanding of what constitutes secure and insecure use of ICT facilities particularly need to be targeted.

1. Background

A recent survey for the ICT and Telecommunications board indicates that while the level of ICT penetration in the Danish population is high, the level of ICT safety and security awareness is low. In their survey conducted in 2005, Parkegaard & Kristensen [10] concluded that this low level of awareness should be a cause for concern. A Nordic survey, SAFT 2003 [5], of parents' use of the Internet and their attitudes to their children's use of it showed similarly that, while Denmark had the highest penetration of Internet use in the Scandinavian countries, the level of ICT safety awareness among parents was the lowest. A primary reason for this was the positive attitude of Danes to the benefits of the Internet, which underplayed the potential hazards. It was also apparent from the survey that Danish parents are the least motivated towards the use of filtering for regulating children's access to Internet content, as they regard filtering as authoritarian, and would prefer informed choice-making. Attitudes such as these have a marked influence on how the task of improving citizen ICT safety and security should be approached.

Unfortunately, although several attempts at collecting up statistical material about people's attitudes, knowledge of IT safety and security issues, use of appropriate equipment and/or software and so on have been made, much of this work has focussed on isolated aspects of ICT safety and security, and there seems still to be no reliable overall picture of the Danish population, nor even of various "critical groups" who might *a priori* be considered to be specially at risk.

A significant problem is that it is not easy to investigate people's attitudes and behaviour patterns in relation to complex technological matters such as ICT security, since there is a real risk that the respondents in a survey simply do not understand the questions put to them. The design of a reliable survey covering large segments of the Danish population is therefore a considerable challenge, which we believe can only be met by developing methods that include media-rich types of representation, such as animations and simulations, in the questionnaires, in order to provide the respondents with an experience they may respond to through interactivity and choice-making based on real-life scenarios. This approach will provide data that goes beyond the limitations of a more traditional questionnaire. We will develop this new methodological approach in order to ensure better understanding of the research issues with the respondents. Since this is a new approach within this area of research, there are no previous results on the exact implications of this method, but there are a number of results from educational research which indicate that animations used carefully with interactivity may facilitate conveying conceptual information and causal relations [13].

Most previous attempts to survey the Danish population's attitudes to ICT safety and security have been based either on the simple collection of statistical material (such as the number of items of protective software sold) or on the use of what are essentially questionnaires, either intended for the respondent to fill in, or read out to the respondent in the course of a telephone interview. Very little attempt seems to have been made to discover the depth of the respondents' understanding, and such surveys can therefore be regarded with a certain degree of mistrust. Often there is a low level of response from participants using text-based questionnaires, while the use of visuals, animations and simulations in the questionnaire tends to lead to a greater motivation to participate in the survey.

In order to explore the fundamental assumptions and concepts about ICT safety and security awareness we will make use of a research design which incorporates both qualitative and quantitative methods, combining focus-group interviews and individual qualitative research interviews with computer-assisted surveys in a mixed method approach. We will work with a sequential mixed method sampling. In the qualitative part of the study we shall use a purposive sampling, in order to identify the most pertinent issues to explore in the quantitative part of the investigation.

2. Research Plan

The main aim of this programme of research is to determine the current level of knowledge about and attitudes to safety and security issues in the use of ICT facilities. However, awareness issues may be specific to socio-cultural contexts and groupings, and it is therefore important to define both the issues and the target groups, in order to be able to develop new ways of improving the situation.

Because of the recognised weaknesses in questionnaire-based surveys on complex technical subjects, which may be ascribed to the difficulty of designing appropriate questions to expose technical awareness issues, we shall take a progressive approach, involving an initial qualitative exploration of the users' concepts of safety and security issues, in order to qualify the final questionnaire-based survey in terms of content and design.

Phase one: Initial Survey

The first phase of the project will be to survey current approaches to the issues of ICT safety and security, and to collect pertinent information from other, international investigations. Furthermore it will involve a closer look at the safety and security awareness material available in Denmark at the present moment, including recent national internet safety campaigns, such as that described on http://www.danmark.dk/portal/page/pr04/DANMARK_DK/Forside/itborger/it_sikkerhed, and educational materials produced within the safety awareness network SAFT, supported by the EU.

The project partners intend to exploit their contacts to Nordic and other European institutions, in order to build up a picture of the current state of the art in Europe and (to the extent possible within budgetary limits) elsewhere. The aim of this phase is to establish a suitable foundation for performing a survey of the situation in Denmark in the two following phases of the proposed project. This involves not only collecting and comparing the bare statistical information about *what* citizens know and do in various countries and social groupings, but also collecting information about *how this information was collected* from the respondents in the various surveys, so that we can plan suitable ways of carrying out our own surveys.

Since this latter type of information is not always readily available, we envisage that this phase of the project will not only involve searching the literature and requisitioning reports, but will also require personal interviews with key persons who are (or have been) involved in relevant projects, so that this phase will involve a considerable amount of travelling. The phase is expected to occupy months 1-6 of the project period, and will terminate at a milestone where a report covering current knowledge about attitudes and current practice is available.

Phase two: qualitative survey

The second phase of the project will be to conduct qualitative studies of selected groups and individuals in order to identify existing concepts of safety and security awareness amongst ICT users. Initially a series of five focus-group interviews will be carried out in different regions of Denmark, in order to explore concepts of safety and security amongst users in different socio-cultural contexts. Based on the themes that have emerged in the focus-group interviews an interview guide will be developed and a purposive sampling of informants will be performed in order to carry out the qualitative interviews with 30 informants.

Personal interviews are extremely expensive and work-intensive operations. Such interviews will therefore only be carried out with a small number of respondents (about 5-6 from each critical group). With such small sample sizes, only qualitative results can be expected. But with a carefully designed interview scheme, they may nevertheless give very important information, in particular about the reliability of the other parts of the investigation.

The interviews will be conducted in the homes or workplaces of the informants using a mobile usability lab, and will use examples of real-life critical security situations in order to elicit immediate responses from the informants, that can be triangulated with their reflections about the situations drawing on experimental reception methods [1,8]. These critical situations will subsequently be developed into interactive animations and simulations [11] that can be used in the third phase of the project. However, interactive animations are expensive to develop, and in this project we expect only to have resources to implement a small number of them, in order to demonstrate the principles involved. These will be carefully selected to illustrate particularly critical situations. We intend to apply for further funding from other sources, in order to extend the repertoire of situations which are covered. The participants will be sampled and the interviews will be analysed according to principles of Grounded Research proposed by Glaser & Strauss [3], in order to generate conceptual insights.

This phase of the project is expected to occupy months 7-18 of the project period, terminating with a milestone where specific issues which need to be faced, if the general level of ICT safety and security is to be improved, have been identified.

Phase three: Quantitative survey

Based on the findings in phase two, a quantitative on-line survey will be designed to explore the key-issues with a larger group of respondents. The survey will be designed as a combination of a traditional text-based questionnaire with interactive sequences, in order to elicit more reliable responses from the respondents, as they are made to respond to simulated real-life situations.

The quantitative survey will be carried out in a close collaboration between all the partners, where TDC will mediate access to information which can be used to contact appropriate groups of Internet users. Statistical services for use in the investigation will be made available by DTU, who are experienced consultants in the area of statistical surveys. A considerable effort in this phase will go into the design of the actual questionnaires to be used; for this purpose, the knowledge accumulated in phases 1 and 2 will be exploited as far as possible. New methods for representations will be developed in the media-rich on-line questionnaire involving animations and simulations, and mind-mapping techniques will be used in order to collect up and structure the concepts employed by the users. By comparing the way in which users relate these concepts with an ontology based on standard safety and security concepts, using the principles followed in [12], we hope to be able to produce recommendations for efficient future strategies for raising safety and security awareness.

The general survey of the population will be performed on an unstratified sample of at least 2500 users, randomly chosen from the population, as in most large-scale statistical investigations of the Danish population. A separate survey of the supposedly critical groups will be carried out by approaching members of such groups via the Internet with an offer to take part in a survey of knowledge and behaviour. . The critical groups are those which *a priori* might be expected to be at risk, such as:

- Children and young persons still under education,
- Elderly people,
- Office workers with no IT training,
- Housewives at home with no current connection to the labour market,
- SMEs with modest resources available for IT security training.

For such selected groups, a group size of 250 active respondents is considered sufficient.

This phase of the project is expected to occupy months 18-24 of the project period, terminating at a milestone where the general level of safety and security awareness has been established and three or four critical groups of users have been investigated in some detail.

Phase four: Final report and coordination

The last phase of the project will focus on the final analysis and presentation of the results accumulated during the first three phases. Because of the mixture of qualitative and quantitative data which will be collected, at least six months will be required. During this phase, we also hope to be able to coordinate our work with that carried out in other projects within the Citizens IT-security research programme. The plans for this coordination will have to be discussed in more detail when descriptions of the other projects have been made available.

References

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