IST-2001-33127

SciX

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D11: Overall assessment and evaluation report

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Access: private
Status: pre-release, draft
Version: 0.1
Date: November 4, 2002

EXECUTIVE SUMMARY:

This report (in its current version) describes the assessment and evaluation **method** of the SciX project. It is a working, internal document, not scheduled until the end of the project.

The contribution of SciX is at least two fold:
- pilot software will be developed.
- new business models will be proposed and existing processes re-engineered.

This fact is reflected in the different validation approaches. One methodology is used to evaluate the technical merits of the created pilot software, another to measure the innovation and the new business models, the third one compares the results to the claims made in the technical annex. The two methodologies are:
1. ISO 9241 (Part 10) IsoMetric usability inventory. This method is generally used to evaluate the usability of commercial grade software products.
2. The SWOT analysis. This method examines the strengths, weaknesses, opportunities and threats. It was developed to evaluate business proposals and process re-engineering effects. In the context of the SciX project it was used to evaluate the each of the software products of SciX against the four SWOT features as well as against some of the features promised in the SciX Technical Annex.
3. Comparison to the technical annex (not a formal methodology).

These analyses should be performed on each component both internally by the project partners as well as by external evaluators - possibly by the members of the SciX target user group. On-line tools will be created to perform the evaluation.

RELEASE HISTORY

date   changes
3.11.2002   Version 0.1 ... proposed methodology only

TABLE OF ABBREVIATIONS

SWOT ... strengths, weaknesses, opportunities, threats

TABLE OF CONTENTS:

1. OBJECTS OF VALIDATION

SciX created the following services and/or tools:

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They are evaluated using the SWOT method and compared to the plans made in the Technical annex. They are also evaluated using the ISOmetric method.

2. ISOMETRIC METHOD

2.1 METHODOLOGY

The purpose of this method is to assess the usability of software services developed in SciX. It does so by asking users a number of questions using a questionnaire. This questionnaire is structured in two parts:

- First Part: General information about the user (in particular his company) and his/hers experiences with virtual organisations (VO).

- Second Part: Evaluation of the services with the IsoMetrics technique

The IsoMetrics usability inventory provides a user-oriented, summative as well as formative approach to software evaluation on basis of ISO 9241 (Part 10). The current version of IsoMetrics comprise 75 items adapted from the seven design principles of ISO 9241 (Part 10):
- Suitability of the task
- Self descriptiveness
- Controllability
- Conformity with user expectations
- Error tolerance
- Suitability for individualisation
- Suitability for learning

The statement of each item is assessed on a five point rating scale starting from 1 ("predominantly disagree") to 5 ("predominantly agree"). A further option ("no option") is offered to reduce arbitrary answers.

The IsoMetrics design provides information that can be used within an iterative software development.

2.2 ISOMETRIC QUESTIONS

2.2.1 GENERAL
Given Name:
Family Name:
Email:
Phone:
Fax:
Roles:

2.2.2 RELEVANCE
User Defined Role
Company name: Enter company name in which you work

Company Size: (How many employees are in the company)
Business Sector: Select in which Construction Business Sector you work
Technical Interest Area: Select Main Construction Technical Interest Area
Products & Services: Select which Products and Services your company offer
ERP Systems: Do you use: Enterprise Resource Planning System (ERP)
ERP Systems usage: What is the level of use of ERP Systems
E-commerce Systems: Do you use: E-Commerce System
E-commerce Systems usage: What is the level of use of E-commerce Systems
CAD/CAM Systems: Do you use: CAD/CIM and Product Data Management Systems
CAD/CAM Systems usage: What is the level of use of CAD/CAM Systems
Workflow / GroupWare: Do you use: Workflow Management / Groupware Systems
Workflow / GroupWare usage: What is the level of use of Workflow / GroupWare
Knowledge Management System usage: What is the level of use of Knowledge Management System
What is the level of use of Knowledge management systems usage
Communication Systems: Do you use: CSCW and Communication Systems
Communication Systems usage: What is the level of use of Communication Systems

2.2.3 SUITABILITY TO TASK

All questions are answered by a spectrum of agree/disagree options:
1.1: The software forces me to perform tasks that are not related to my actual work.
1.2: The software lets me completely perform entire work routines.
1.3: The functions implemented in the software support me in performing my work.
1.4: The way in which data is entered is suited to the tasks I want to perform with the software.
1.5: I perceive the arrangement of the fields on-screen as sensible for the work I do with the software.
1.6: Too many different steps need to be performed to deal with a given task.
1.7: The way in which data is output is suited to the tasks I want to perform with the software.
1.8: The software is well suited to the requirements of my work.
1.9: In a given screen, I find all of the information I need in that situation.
1.10: The terminology used in the software reflects that of my work environment.
1.11: The software provides me with a repeat function for work steps that must be performed several times in succession.
1.12: I can easily adapt the software for performing new tasks.
1.13: The important commands required to perform my work are easy to find
1.14: I am able to adjust the presentation of results (on the screen, to printer) to my various work requirements.
1.15: The presentation of the information on the screen supports me in performing my work.
1.99: Type Questions or Comments on SUITABILITY OF THE TASK

2.2.4 SELF EXPLANATORY

2.1: I can call up specific explanations for the use of the system, if necessary.
2.2: I understand immediately what is meant by the messages displayed by the software
2.3: It is easy to retrieve information about a certain entry field.
2.4: When menu items are not available in certain situations, this fact is visually communicated to me.

2.5: If I want, the software will display not only general explanations but also concrete examples to illustrate points.
2.6: The explanations the software gives me clearly refer to the specific situations in which they are output.
2.7: If I want, the software displays basic information about conceptual aspects of the program.
2.8: The software provides me with enough information about which entries are permitted in a particular situation.
2.9: I can tell straight away which functions are invoked by the various menu items.
2.10: The terms and concepts used in the software are clear and unambiguous.
2.11: The software always visually marks the current entry location (e.g. by a highlight, a contrasting color, a blinking cursor, etc.).
2.12: I can easily tell the difference among feedback messages, requests to confirm inputs or commands, warnings, and error messages.
2.99: Type Questions or Comments

2.2.5 CONTROLABILITY

3.1: The possibilities for navigating within the software are adequate.
3.2: The software makes it easy for me to switch between different menu levels.
3.3: The software lets me return directly to the main menu from any screen.
3.4: I can interrupt any dialog at any time.
3.5: It is always easy for me to evoke those system procedures that are necessary for my actual work.
3.6: It's easy for me to move back and forth between different screens.
3.7: The software allows me to interrupt functions at any point, even if it is waiting for me to make an entry.
3.8: The navigation facilities of the software support optimal usage of the system functionality.
3.9: In order to perform my tasks, the software requires me to perform a fixed sequence of steps.
3.10: When selecting menu items, I can speed things up by directly entering a letter or a command code.
3.11: It is always possible to abort a running procedure manually.
3.12: The possibilities for navigating within the software are adequate.
3.99: Type Questions or Comments on CONTROLLABILITY

2.2.6 CONFORMITY WITH USER EXPECTATIONS

4.1: The software is inconsistently designed, thus making it more difficult for me to do my work.
4.2: I can anticipate which screen will appear next in a processing sequence.
4.3: I have no difficulty in predicting how long the software will need to perform a given task.
4.4: The designations are used consistently in all parts of the software I am familiar with.
4.5: I find that the same function keys are used throughout the program for the same functions.
4.6: When executing functions, I have the feeling that the results are predictable.
4.7: My impression is that the same possibilities are consistently available for moving within and between different parts of the software.
4.8: The messages output by the software always appear in the same screen location.
4.99: Type Questions or Comments on CONFORMITY WITH USER EXPECTATIONS

2.2.7 ERROR TOLERANCE

5.1: When working with the software, even small mistakes have sometimes had serious consequences.

5.2: Even if I make a mistake, the information (e.g. data, text, and graphics) which I have just entered is not lost.

5.3: If I make a mistake while completing a form, I can easily restore everything to its previous state.

5.4: When I attempt to perform a destructive operation (e.g. deletion of data etc.), I am always first prompted to confirm the action.

5.5: My impression is that very little effort is involved in correcting mistakes.

5.6: When I make entries, they are first checked for correctness before further processing is initiated.

5.7: No system errors (e.g. crashes) occur when I work with the software.

5.8: If I make a mistake while performing a task, I can easily undo the last operation.

5.9: I have never made an entry that caused a software error (e.g. a system/program crash or an undefined dialog state).

5.10: The software includes safety features to help prevent unintended actions (e.g. critical keys spaced apart, clear designations).

5.11: The software provides me with useful information on how to recover from error situations.

5.12: I perceive the error messages as helpful.

5.13: In some situations the software waits too long before calling attention to wrong entries.

5.14: The software warns me about potential problem situations.

5.15: The software lets me keep the original data even after it has been changed.

5.16: When working with the software, even small mistakes have sometimes had serious consequences.

5.99: Type Questions or Comments on ERROR TOLERANCE

2.2.8 SUITABILITY FOR INDIVIDUALISATION

6.1: The software lets me adapt forms, screens and menus to suit my individual preferences.

6.2: The software can be easily adapted to suit my own level of knowledge and skill.

6.3: I am able to adjust the amount of information (data, text, graphics, etc.) displayed on-screen to my needs.

6.4: The software lets me change the names of commands, objects and actions to suit my personal vocabulary.

6.5: I can adjust the attributes (e.g. speed) of the input devices (e.g. mouse, keyboard) to suit my individual needs.

6.6: I can adjust the software's response times to my own personal working speed.

6.99: Type Questions or Comments on SUITABILITY FOR INDIVIDUALISATION

7.1: I needed a long time to learn how to use the software.

7.2: It is easy for me to relearn how to use the software after a lengthy interruption.

7.3: The explanations provided help me understand the software so that I become more and more skilled using it

7.4: So far I have not had any problems in learning the rules for communicating with the software, i.e. data entry.

7.5: I was able to use the software right from the beginning by myself, without having to ask co-workers for help.

7.6: I feel encouraged by the software to try out new system functions by trial and error.

7.7: In order to use the software properly, I must remember a great many details.

7.8: I find it easy to use the commands.

3. THE SWOT METHOD

3.1 METHODOLOGY

SWOT analysis is a technique commonly used in business circles to assist in identifying strategic issues for a company or organisation. The predictive capabilities of the technique come about from the consideration of each system's strengths and weaknesses in the context of the environment, which is seen to present opportunities and threats. The intention is to determine how each product will fare in the light of changes taking place around it.

3.1.1 STRENGTHS

This topic attempts an answer to the following questions:
- What did we do well in the product?
- What are the advantages?
- What is new and original?

3.1.2 WEAKNESSES

This topic attempts to answer the following questions:
- What could be improved?
- What is done badly?
- What should be avoided?

This should be considered from an internal and external basis - do other people perceive weaknesses that we don't see? Do the competitors do any better? Face any unpleasant truths as soon as possible!

3.1.3 OPPORTUNITIES

This topic attempts to answer the following questions:
- Where are the good chances facing you?
- What are the interesting trends?

Useful opportunities can come from such things as:
- Changes in technology and markets on both a broad and narrow scale
- Changes in government policy related to your field
- Changes in social patterns, population profiles, lifestyle changes, etc.

3.1.4 THREATS

This topic attempts to answer the following questions:
- What obstacles do you face?
- What is your competition doing?
- Are the required specifications for your products or services changing?
- Is changing technology threatening your position?

3.1.5 EXAMPLE

Below is an example of how a SWOT analysis might look for a fictional animal greeting card site, specializing in pictures of ground-clinging creatures such as slugs, snails, and puppydog tails.

Strengths
- Unique idea, no one else is even close
- Strong artistic team includes some of the finest slug and insect illustrators in the country
- Excellent animation abilities
- Source of inspirational card inscriptions for all occasions
- Experienced and innovative company officers.

Weaknesses
- Small opt-in customer list, most site users seek to remain anonymous
- Few advertisers interested in this strangely targeted market
- Perl script that runs the site is slow and needs to be rewritten in a compiled language
- Lack of interest from venture capitalists.
- Single stream of revenue is advertising, and that is slim pickin's.

Opportunities
- No real competitors in our precise space.
- Much traffic from students at UC Santa Cruz (Banana Slug is their mascot) sending cards to each other. Possible joint venture with alumni association and the *Official* Pacific Northwest Slug Page http://www.tammyslug.com
- Seek advertising from French restaurants and their suppliers.

Threats
- Chemical companies are producing more effective snail bait that may destroy gastropod populations in our lifetime.
- Large card sites such as Blue Mountain (http://www.bluemountain.com) might want to take over the slug and mollusk traffic and edge us out.

4. FULFILMENT OF OBJECTIVES

This method will ask if these goals were achieved:

4.1 ENABLE EFFICIENT ACCESS TO SCIENTIFIC RESULTS

- speed up the process from submission to final publication,
- allow a more rich content (multi-media),
- provide readers more efficient mechanisms for retrieving publications of interest
- increase readership through the abolition of barriers such as subscriptions.

4.2 PROVIDE ACCESS TO NON-SCIENTISTS

- increase the number of readers from industry and from smaller universities,
- reduce time spent in searching and retrieving relevant information.

4.3 RE-ENGINEER THE PUBLISHING PROCESS AND PERFORM A SOCIAL-ECONOMIC ANALYSIS

- scientific publications not as a commodity to be sold or archived as an essential part in a larger scientific communication process
- solutions based on the premise of globally free information on the world wide web, thus **side-stepping some of the traditional intermediaries** altogether.

4.4 AUTOMATE REPOSITORY MANAGEMENT THROUGH SELF ORGANISATION

- create clusters of data automatically
- clusters of similar papers, which should be of interest to the reader as well

4.5 SIMPLIFY USE THROUGH INTELLIGENT PERSONALISED AGENTS

- user profiling system
- automatic notification on new papers matching the profiles' interest
- selective searches

4.6 INVESTIGATE LEGAL, SOCIAL AND PSHYCHOLOGICAL ISSUES

4.7 DEVELOP BENCHMARKING METHODS FOR SCIENTIFIC JOURNALS