DESIGN: HOW CAN WE COPE WITH CHANGE?

Introduction to the panel session

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Abstract: Significant progress has been achieved in developing design methods and tools. Yet there remains a continuous struggle to cope with change. New application fields reveal considerable inadequacies as it had been the case with office systems. Now with e-Business a novel demands have become apparent and design has to defy that challenge.

1. DESIGN AND THE QUEST FOR CONTINUOUS IMPROVEMENT

For information systems design a big diversity of methods has been developed during the years. Methods and tools cover at least several segments from the following list of subtasks: information management; strategic planning; defining projects; setting goals; describing the status quo; eliciting users' anticipations; defining requirements; studying feasibility; deciding alternatives; modelling future systems; defining databases; describing tasks; generating user interfaces etc.

Achieving an overview over the field is not easy as the scenery appears somehow confusing. The reasons are divers: a plethora of methods and tools; an often eclectic manner of combining heterogeneous elements; a confounding discrepancy in the use of terms (sometimes created deliberately on marketing reasons), etc. There have been several attempts to create order just to mention the historic and remarkable effort of CRIS/ISDM started within IFIP WG8.1 (Olle at al, 1988). This volume defined common key concepts and their intricate relationships such as to mention some topics: design products consisting of components; steps, stages and techniques

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leading to components; scenarios, options and responses contributing to the design process; perspectives leading to particular components; paradigms and techniques converging to tools etc.

Design always has to cope with change since new technologies emerge as well as further application fields come up. For this reason several strategies for improvements have been evolved. Two common ways of enhancement are augmentation and extension. They work with either enriching a tool by additional features or widening the scope by covering a broader sector of the development cycle. Further, concatenation of methods can be used. In adding complementary paradigms concatenation may counterbalance methodological biases. Often embedding methods and tools in a broader context becomes necessary which may consequently result in creating a rather novel approach.

2. NEW APPLICATION DOMAINS

The intrinsic problems of a specific application may cause difficulties for existing tools. Thus, as soon as systems design concerns new application fields new ideas have to come in. First, when systems are implemented and used in a particular domain an internal dynamic of its own theories, concepts, terms and techniques goes on. This has to be blended with a second approach, so to understand the world of the particular domain in question - in which systems are to operate and for which systems are designed to render support. Therefore a creative dynamic emerges as well given by the target domains and the disciplines which study them. Thus inter-disciplinary relations come in. It is not enough to approach domain problems in purely functional terms (as e.g. tasks with inherent properties that are to be broken down and systematically addressed); more, one has to combine views and concepts of different disciplines: Computer Science; Management Science, Psychology, Sociology, Ethnography etc.

3. A HISTORICAL EXAMPLE: DESIGNING FOR OFFICE AND ADMINISTRATION

Just to recall an instance from last decade: designing offices and administrations mainly focussed on work settings which are most amenable to a closely-defined, procedural approach: payroll, accounting, order processing and further prevalent office procedures. This wide range of applications is constrained - on administrative, legal and organisational

reasons - by highly formal, bureaucratic procedures and so predisposed for "programmed" solutions. Hence early office systems applied procedural models and common databases to office work that consists of strictly structured tasks. No doubt that these systems had gained widespread usage - but below the surface of success there was a steady discontent about these systems and their intrinsic limitations. No wonder, because systems that were aimed at help and support people in their work, failed to do so. In some circumstances even they impeded people's working practices and caused frustration.

This is the context in which a new approach to systems design gained prominence; one had to move beyond strictly-defined processes into the support of higher-level organisational processes. These involve decision-making, negotiation and collaboration - areas characterised by flexibility and rapid change rather than constancy. For more details on requirements and solutions for administrative work situations reference is given to (Shapiro and Traunmüller, 1993). The following gives an illustration how the model becomes intricate in extending.

4. TAKING THE WORKFLOW PROCESS MODEL AS AN ILLUSTRATION

The commonly accepted model of business processes is much too closely formed in a conveyor-belt view that is derived from industrial production processes. As a remedy for this several extensions are necessary for getting a realistic description. Here a short explanation of revisions of workflow thinking may suffice:

1. Generally, widening the prospects on the model domain is necessary just as to cite: organisations including responsibilities, procedures, expertise, and policies; users with reference to their general knowledge, problem expertise and personal style of work; administrative work including the actual way of performing activities, the interrelationship of activities and the obedience to semiformal rules.
2. An important revision puts the focus on cooperative work. Many administrative decisions are being taken collectively, and such processes could be supported with platforms for collaborative work such as sharing working spaces, as well as more sophisticated products such as application-sharing and videoconferences.
3. Two aspects closely correspond in governance: a pronounced work mode of collaboration on one side, and a new knowledge-rich environment for public action. Thus knowledge enhancement is a further point. With

administrative work evolving to networks of technology mediated interaction many improvements based on knowledge technology are feasible

4. For administrative work a deeper understanding of decision-making processes at the operative level is necessary. Often they follow a pattern which only gradually unfolds as the process is taking shape. Such processes can only partly be standardised. Public administrations consider the individualised handling of cases as their main business that has heavy consequences. Thus legal interpretation and subsumption as well as extensive negotiation and consensus processes play a crucial role in a (mostly open) decision process.
5. Next, in processes that deal with electronic service delivery, it is useful to regard the process from two sides: the standpoint of the citizen and that of the producer of the service. Seen from the citizen point of view several stages have to be handled: information (about the service or product and ways to obtain it); intention (making contact with the service provider); contracting (clarifying conditions, setting the stage, negotiation and conclusion of the contract); settlement (product /service vs. money); aftercare (evaluation, customer feedback, complaints).
6. Finishing, informational guaranties come in - touching both, security concerns and legal boundaries. A number of questions are sharpened in comparison to commerce: privacy aspects and the legal importance of the identity. Moreover, administrative structures have a lot of additional functions: protecting the rights of citizens; ensuring procedures bound to the rules of law; safeguarding legal validity. These all are aims which cannot be sacrificed for the sake of process optimisation.

5. E-BUSINESS AS CURRENT CHALLENGE

E-Business is the most recent guiding vision in using information technology for business. In a concise definition it means "doing business over interconnected networks using Web-based technologies". So the Internet is redefines business relationships. Leaving the details to the literature (e.g. Cronin, 1996; Alpar, 1998) we want to sketch three significant traits:

- A prime feature is a holistic view on the system which allows that the enabling potential of IT opens up a wide range of technical and organisational options. To start with, this means integrating flows of information, money and goods.Together with innovative forms of organisation this means pressing for significant change in the way business is done.

- Another thing is supporting the complete relationship. Taking trade as an example this means promoting and communicating company and product information to a global user base. This includes accepting orders and payments for goods and services as well as providing ongoing customer support and feedback.
- A further trait are secure and legally binding transactions. Commercial applications demand specific guarantees. So issues of standards (Olle, 1998) as well as of information and communication security (Galindo, 1998) become design criteria. The establishment of a protected and trustworthy environment is of paramount significance.

The establishment of a protected and trustworthy environment is of paramount significance. So issues of standards (Olle, 1998) as well as of information and communication security (Galindo, 1998) become design criteria. They have to be conceived broadly, comprising the following features to varying extents: confidentiality, reliability, integrity, identification, authentication, non-repudiability, anonymity and pseudonymity. These functions are the basis of more complex functions and will eventually amount to a system of informational guarantees.

6. PANEL DISCUSSION ON CHANGE

Given the complexity of e-Business, a limited concept of design as well as inadequate methods and tools will put at stake systems development. So first, the panel wants to reach an holistic view on design; next focus is laid on requirements drawn from e-Business; then the significant potential for profound changes is considered. So, in the course of discussion one may obtain a deeper comprehension how the state of technological offer and the demands from practice may meet. Formulating of directives and for research and guidelines for developments is an central objective. The panel includes the following members:

Roland Traunmüller, Austria (Chair)
Michael Hannani, Israel
Bill Olle, United Kingdom
Igor Hawryszkiewycz , Australia

7. REFERENCES

Alpar, R. Kommerzielle Nutzung des Internet. Springer, Berlin, 1998.

Cronin, M. "The Internet Strategy Handbook". Harvard Business School Press, Boston, 1996.

Galindo, F. Globalization, Security, and Democratic Engineering. Elements for Telecooperation. In R. Traunmüller, R. and Csuhaj, E. Telecooperation. Proceedings of the XV. IFIP World Computer Congress. OCG, Wien, 1998.

Globermann, S. "Beyond Convergence – communication into the next millennium". Online-Proceedings of ITS 12th Conference, 1998, http://www.its98.org/.

Olle, T.W. International Standards needed to Support Electronic Commerce. In Traunmüller, R. and Csuhaj, E. Telecooperation. Proceedings of the XV. IFIP World Computer Congress, OCG, Wien, 1998.

Olle, T.W., Hagelstein, J., McDonald, I., Rolland, C., Sol, H., Van Assche, F., Verrijn-Stuart, A.A. Information Systems Methodologies. A Framework for Understanding, Addison Wesley, Wokingham, 1988 (2nd Edition 1991).

Shapiro, D. and Traunmüller, R. CSCW in Public Administration. In: Bonin, H. Systems Engineering in Public Administration. Proceedings of the IFIP TC8/WG8.5 Working Conference, North-Holland, Amsterdam, 1993.