Stephan Körnig
Wolfgang Meier
Rudi Schmiede

User Needs and Digital Libraries Design

Darmstadt University of Technology
Working group *telos*
(**t**echnology for **e**lectronic **l**ibraries and the **o**rganization of the **s**emantic web)

Rudi Schmiede

User Needs and Digital Libraries Design (1):

Information and Knowledge in the “Information Society”

Distributed Information Structures in Science

Outline

- What are user needs?
- What does “information society” mean?
- Information and/vs. knowledge
- What is new in the digital era?
- Distributed digital information structures
- Strategic issues in DL design

The social frame

- User needs are not fixed entities, not simply to be questionaired
- Formed by work situation and environment
- Dependent on possibilities of access
- Change according to “communities of practice”

Distributed concepts

- Make possible to access manifold resources and services
- Local interface must be simple and powerful
- Today’s universal access tool: The Web browser
- “Global information at your fingertips”

User needs

„Information Society“

Information and knowledge

Digital era

Distributed systems

Strategic issues

Virtual Integration of resources and services

- Same user in different roles: Modelling of “use cases”
- Differences according to scientific disciplines and to work in univer-sitiy or industry
- Importance of local and discipli-nary resp. thematic accesses

Heterogeneous information objects

- Scenes have to be made transparent to the user
- Important are documents, but also people (in their different roles), projects, communities, institutions, providers, archives
- Consequence: Highly modularized design of scientific information systems

The Social Framework: Informational Capitalism

- Answers to world economic crisis of the mid-70ies: globalization and informatization
- Intensified competition in the world market in 80ies and 90ies
- Omnipresence and new immediacy of economics
- Castells: “Informational Capitalism” Schiller: “Digital Capitalism”

Globalization and Networking

- Neoliberalism, de-regulation, erosion of the national state
- Transnational enterprises
- International markets for goods, capital and labour
- Networking on all levels
- Social polarization

Informatization

- Ubiquity of digital IuC technologies
- IuC technologies as technological basis of informational capitalism
- SOA/Web Services as a new stage of network technology adequate to globalization
- New drive towards standardization

Informatization: New quality of information

- Development of globalized socio-technical systems to generate, communicate and process information in “real time”
- Reflexivity of information, knowledge and innovation
- Basis for new dimensions of division of labour and global networking

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New Markets and Organizations

- Market-oriented forms of organizations in business and society
- Re-engineering, specialization
- Network and virtual enterprises, horizontal organizations
- Decentralization and centralization
- Increased uncertainty and risks

Knowledge resources

- Increasing importance of knowledge resources in organizations
- Enhanced importance of external sources of information and knowledge
- Separation information searching – information provision by specialists
- Orientation to contribution to value-creating chain (“intellectual” capital)

Knowledge work

- Polarization into upper layer of “symbol analysts” (Reich) and majority of victims of informati-zation and rationalization
- Erosion of “normal” work forms
- Discontinuous working biographies
- Scientific work 30% in institutions of science, 70% in business

Information vs. knowledge

- Information is raw material: Abstracted formalized content
- Information always positively defined, otherwise it can not be modelled technically
- Knowledge bound to subject, oriented to experience, to be interpreted and communicated, can be defined only negatively

Knowledge beyond information

- Knowledge is critique of information, systematically includes non-knowledge
- Knowledge remains “tacit” or “implicit” or “personal”
- Close relation to acknowledgement and appreciation
- Social and political embedding: “Knowledge is power” (Bacon)

Knowledge management

- Increasing role in business and organizations
- Between the two poles of information management and social network
- Limits: Dependence on culture of appreciation, motivation, and cooperation
- Bound to working networks and people willing to give away their knowledge

The Past: The “Gutenberg-Galaxis”

- Resources and providers: Printed material, specialized scientific information centers with special databases
- Products: Book and journals, working papers, “grey” literature, personal distribution
- Libraries and archives to keep the printed sources as cultural heritage (and often protect them against users)

The “Gutenberg-Galaxis”: Functions and problems

- Quality evaluation by refereeing
- System of status and career access and allocation
- Central role of science publishers
- Role of universities and learned societies in scientific publishers, ambivalent interests of scientists
- Slow and expensive publication process

The future: Distributed digital information structures

- Today already: Distributed digital access to scientific information is basis of modern scientific work
- Heterogeneity of forms and resources of information: Not only numbers, letters, pictures, maps, but also algo-rithms and large calculation systems, simulations and results, visualization, interactive objects (“dynamic” documents)

Distributed digital information structures: New problems

- Heterogeneity of providers: Individuals, institutes, universities, enterprises, service providers, state authorities etc.
- Heterogeneity of forms or provision: Commercial, fee-based and cost-free goods
- Heterogeneity of user access: Local/ regional, theme or discipline-based or general access

Distributed digital information structures: New qualities

- In principle unlimited possibility to multiply and transport contents
- In principle unlimited access to informations not protected via the web
- “Private” publicity becomes possible, e.g. by homepages, links in publications, chat, newsgroups, i.e. new access to media

Distributed digital information structures: New issues

- Culture of multitude vs. “explosion of nonsense” (Wehrsig): New constella-tion of private and public interests
- Situation in transition: First experi-ments to bring new structures and order into the growing chaos
- Digital publications by science publi-shers, autonomous networks of scien-tists (e.g. MathNet, PhysNet, SozioNet), new university publishers etc.

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Distributed digital information structures: Areas of R & D

- Creating and collecting information on user behaviour and user needs
- Improvement of local access and information and knowledge manage-ment in scientific institutions
- Building of domain-specific disciplinary portals and services
- Standardization to make possible open access

The current situation

- Competing, often particularized concepts
- Strong tendencies to international standards of web-based services/
  XML as universal format
- Scientific information: Domain specific tools and portals, interdisciplinary islands
- Models for self-publishing and distributed authorship
- Generally, bad and worsening financial situation on user side

Strategic issues: The user

- Integration of the multitude of interesting resources and services for the users at their workplace
- Distributed concept: Access to as many resources and services as possible, integration via local interfaces
- Improvement of transparency of the scientific scene, variable access points (local, disciplinary, theme- or domain-specific)
- Research on scientific collaboration reality

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Strategic issues: Standardization

- Crucial importance of open standards
- Multiplicity of standards, often not transparent, interest dominated development
- Low level of European participation
- Close relation between research and standar-dization, often not seen by research funders
- Problems of long-term preservation (OAIS-standard) under-estimated
- Central role for realization of user needs most often not seen

Strategic issues: Disciplinary services and interoperability

- Modelling activities for disciplinary and domain-specific needs necessary
- One of the central access points for users, concentrated efforts necessary
- Integration of pay- (publishers, provider services, databases) and non-pay contents and services crucial
- Integration of heterogeneous contents and documents (intellectually structured and raw resources) necessary

Strategic issues: Local access

- Importance of local and regional relations
- Integration of various displinary worlds at universities
- Integration of different providers
- Local information and knowledge management to be made a central issue of institution’s management
- Improvement of ability to work with digital media, enabling of abilities to compare and evaluate traditional and digital media

Strategic issues: User access

- Realizing user interests by providing integrated access in the dimensions of

  -- rights and authentification
  -- disciplinary and thematic integration
  -- the economic, pay-related side of usage
  -- information support, counselling and mediation