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Interdisciplinary Information Design with an Empowerment Strategy

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Abstract

An innovative research into a model for ICT enabled Empowerment. By deliberate use of ICT and a feedback-focused communication model in a prototyping process, e-health information based on an empowerment strategy is evaluated.
Overall a risk-driven spiral model is applied for Progress and Complexity handling in order to ensure success.
The process model devised has a proactive approach to interdisciplinary teamwork, organisational web maturity, and the post-modern user's interaction with ICT.
The research is performed and evaluated in cooperation with an interdisciplinary team of health professionals, and voluntary groups of patients from an athletic clinic in a Danish University Hospital.

Results are as follows:

- **Individual level**: Empowerment is evaluated as successful using Empiric reception analysis, based on social and humanistic sciences, and showing traces of Empowerment from the patient's perspective.
- **Organizational level**: Nursing Informatics becomes a tool in the interdisciplinary understanding, allowing the nurses to take responsibility for core nursing themes regarding the healthy and the diseased phases of the patients' lives. Iterative modelling ensuring the results is evident and derived from the patient's perspective.

Keywords: *Prototyping, Spiral project model, e-Health Information, Empowerment, Interdisciplinary Teamwork, Reception Analysis*

Background

As a consequence of the widespread introduction of the Internet, the demand for free, plentiful, and uncensored health information has grown significantly.
This has a direct impacted on the role of the health professionals as gatekeepers to the source of information. The role has moved, towards a contributor of information in a post-modern society. With respect to health information this means, expert-generated information must be available in a form, quality, and context relevance that meets the user's individual needs in the every-day life. As with all other services provided by the health profession the continued quality, and evaluation must also apply to the information distributed.

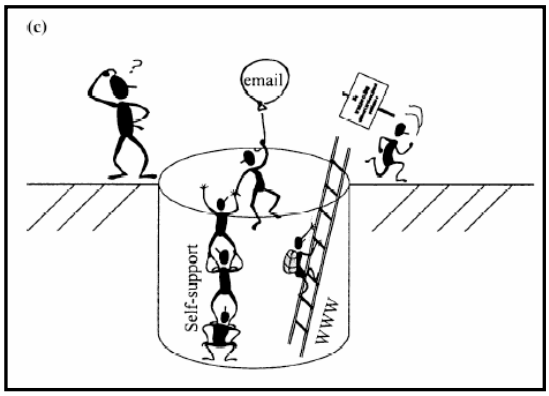

Figure 1 Part of an illustration of a model depicting the relation between patient and health professionals in the internet-age [3]

The illustration (see figure 1) shows the puzzled professional who is wondering, what is going on since the patients are managing without supervision from the self-appointed knowledge provider. A consequence of not taking this new situation serious could be that shared information does not have a health promoting effect. This again could inflict suffering which is a paradox since the goal of the healthcare system is to cure and prevent suffering.

This study was qualified by the results from a pilot-study of patients in a day surgery, evaluating health information from a CD-ROM. They expressed satisfaction with information given in multimedia form, but they wanted to access more information independent from a specific technology.
It showed the need to describe a process constructing information within more accessible ICT Medias, carrying a stronger nursing themes profile, and emphasizing evaluation from the patients' experience of empowerment.

The communication model

The design (see figure 2) was inspired by a commercial communications model, the International Market Communication (IMC, [4]) model which reflects an emphasis on the importance of context when processing a message, and the disapproval of the widespread use of carpet-bombing. This practice is performed on the recipients hoping some information will get through, and become knowledge or actions. The IMC combined with the Empowerment approach are the key ingredients in the resulting model since we must make sure the message can serve our overall purpose, Empowerment.

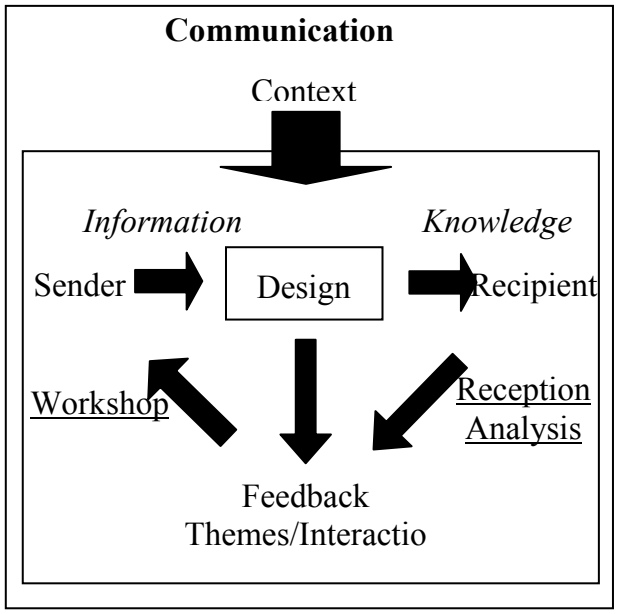

Figure 2 - The communication model inspired by the commercial communications model, the International Market Communication (IMC, [4])

This circular process gives birth to a variety of new perspectives to be taken into consideration by the different levels of nursing in general, and particularly regarding nursing informatics:

- At the professional level – the nursing profession experience a process to focus on the core values and themes in order to meet their own professional and patients' goals for good nursing information.
- At the personal/patient level – the quality of information, the content, and themes of the health information distributed must be accessible in the relevant context and empowering enabling.
- At the technological level – the need for a technology independent model is empathized by the rate of which ICT renews itself, rendering a tech-specific model obsolete before it can be properly validated.

The study process focuses on providing a model for accessible e-health information empowering users in a social or everyday context, while remaining independent from specific choices of technologies.
In this way Empowerment can be observed in the information gathering process when assisting people to assert control over the health-factors which affect their lives.

What is communication?

In a sociologic understanding, communication is interaction between individuals, and always deeply rooted in a context. In the analysis we prioritised both the text and the context at the same time, which gave us information about the socio-cultural importance of the website in everyday living. Empowerment were analysed in the different persons subjective reception and evaluation of how they were able to experience motivation for actions by the information they gained, when interacting with the website.
In the sociological understanding of the term communication is an interaction between individuals where rules and standard systems are rooted in something situational, the context [7]. This means context-less reception is not possible, and there will always be premises used by the recipient in interpretation resulting in subjective assumptions [5]. For communication to take place the recipient must have motivation for initiation of the process in which the information in the designed message is transformed into knowledge. Motivation is achieved by meeting the relevance requirements in the recipient's context. The context requirement contains three values that must be catered to, and is characterized by the 3 discourse types:

- Demand – it must provide answers to real and immediate needs.
- Requirement - it must provide answers to an imaginary need, lust, angst, frustration.
- Experience – it must provide answers to a symbolic requirement, truth, Sense of Coherence.

Experiencing "Sense Of Coherence"

By adopting the salutogenic model developed by Antonovsky (1979, 1987) we see a complementary approach to the pathological model.
Sense of coherence (SOC) is the main variable within salutogenic model, and it provides a basis for the new orientation as health professionals. The salutogenic model explains successful coping with stressors. "Sense of coherence" is a global orientation or enduring tendency to see the world as more or less comprehensible, manageable, and meaningful [1].

According to the salutogenic model, individual SOC has implications for a person's response to various types of stressful situations. Studies have indicated that individuals with a high level of SOC are less likely to perceive stressful situations as threatening and will be

more likely to appraise such situations as manageable. [1]

Aim

The aim of the design and development of the model is to:

- Facilitate a process where healthcare professionals can gain and maintain competence in health informatics, while taking responsibility in developing tailored e-information in accordance to inputs, which can empower users.
- Prevent limiting the implementation health information to specific types of multimedia, hence allowing for the best of breed choice of any given ICT technology in the implementation of empowerment enabling designs.

Methods

This study was designed as an intervention study as illustrated in the project-flow figure 3. Due to the fact, that we are investigating e-health in the Post modern era, the method assume the user's everyday life perspective.
The method has focus on the evaluation of the individual's subjective experience of quality in the reception of health-information. This is done by applying empirical reception analysis in the process.
The overall strategy was a theoretical approach of empowerment, enabling coping, and conveyed by post modern communication in a social construction. By using the method of triangulation in relation to an

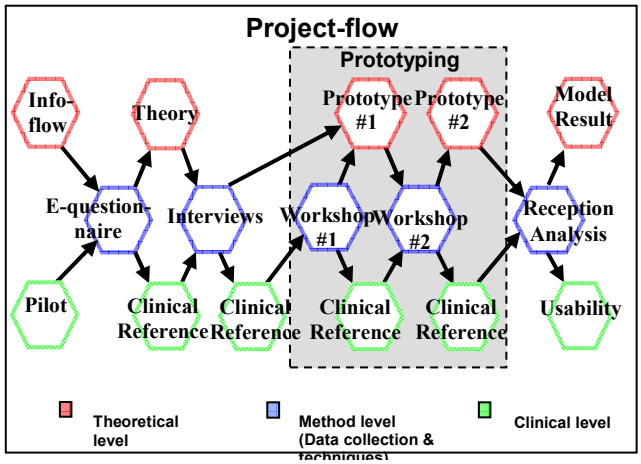

Figure 3 - Project-flow - The study is based on collection of empiric data, starting with the qualification by a pilot study. Through the process different perspectives applied when data was discussed using either the Theoretical or Clinical reference point of view. It resulted in the development of a website prototype which could be examined using reception analysis.

empiric scope, we identified and analysed the development process from the expert's point of view, in **workshops**, focus group **interviews**, and usability tests of the prototypes. This was intended to facilitate a creative environment for the **Clinical referential** group. It consisted of a small team of health professionals: doctors, nurses and physiotherapists, who are specialists in orthopaedic and anaesthesiology practice, and voluntary patients from the same clinic.
During First workshop the whole group was given the opportunity to reflect on web-maturity in the organization and brainstorm on the subject of what is good information to the receiving group; based on the results from the **pilot**-project.

An intervention study was performed of the hypothesis derived from the data collected and processed using the communication model on how to convey the message which could empower the user.
At the conclusion of the **Prototyping** process, reception analysis was applied to the empirically collected data and analysed for traces of empowerment, and thereby providing the necessary feed-back for the next iteration in the Spiral-Process or Communication-flow.
The prototypes were **evaluated** by e-questionnaires from 32 random users, seeking information concerning knee injuries, and a usability study including a journalistic review was performed to support the findings.
The empowerment concept is described in a medical perspective, as it implies both the mobilisation of the patient's own resources, as well as counteracting oppressive forces.

Discussion

General

A common misperception by healthcare professionals is that the consumers need the professionals to reach out, in order to educate them, as seen in Günther Eysenbach's visualization (figure 1).
The ICT-media is already widely in use, and the Internets on-going evolution in complexity and ubiquitous nature into the everyday-life changes the boundary, if any, between how the consumers and potentional patients are acquiring and using health-related information.
The subject can be approached in many ways, but common for them all are how the healthcare professionals view themselves and their role in this communication process.

Clinical reference

The doctors were very ICT aware, and as the nurses were reluctant or unable to focus on the nursing themes when the doctors where present. They where given a separate session, which enabled them to describe how they saw themselves, and the role the nursing themes ought to have in the interdisciplinary teamwork. Being entirely committed to production flows and optimization of treatment they had suppressed the need to put nursing themes on the interdisciplinary agenda. Therefore a deliberate forward moving project model was needed, to enable the different groups to cooperate from different ICT maturity levels.

Spiral project model
In order to mediate the un-even web-maturity of the reference group, and ensure a successful implementation of the derived themes in the process, a Spiralling project model was adopted (see figure 4).
The choice of a Risk-driven Spiral approach allowed the process to perform deliberate iterations each time the designs (prototypes) from a workshop was completed and evaluated. The key factor was the use of prototypes to visualize the intellectual outcome at any given time in the process.

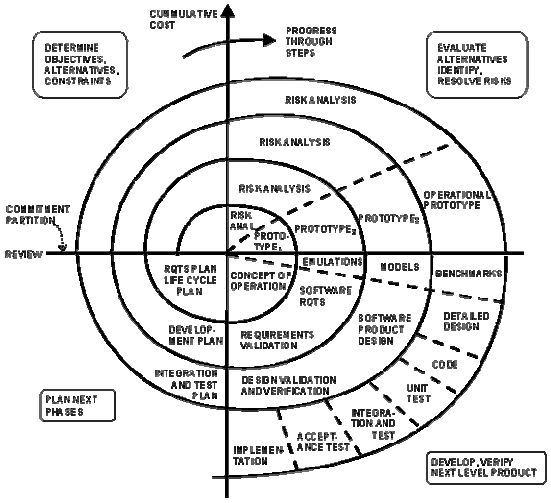

Figure 4 - A new presentation of the original spiral model diagram, published by Boehm in 1988. The main features of the model are: cyclic development; deliberate experimental and risk driven decisions concerning process and product; prevention of repetition and early clarification of unsustainable conclusions. [2]

Prototypes
The themes described by the clinical reference group were implemented in a prototype during each spiral iteration thus resulting in a design of a vertical prototype. (see figure 5)

The presence of a well-defined and interactive example of the end result had a significant effect on the reference group. By performing reviews by the reference group on the completion of an iteration of the spiral, they were much more committed
to the next iteration, as they had seen an outcome of their effort. Further it ensured they understood the decision to engage in another turn on the Spiral-process, while reducing the risk of complexity from the large amount of available data

themes are identified and the process are moving towards the intended goal of an empowerment enabling information design (see figure 6).

Empowerment – new roles
With Empowerment we are moving towards a new way of understanding our role as professionals. We can see the possibilities in ICT for developing solutions where

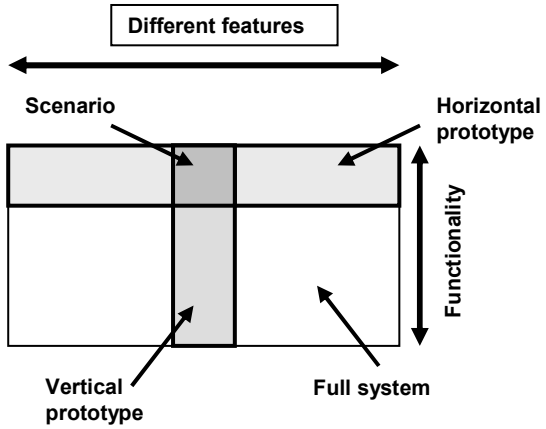

Figure 5 - The concept of a scenario compared to vertical and horizontal prototypes as ways to make rapid prototyping simpler. [6]

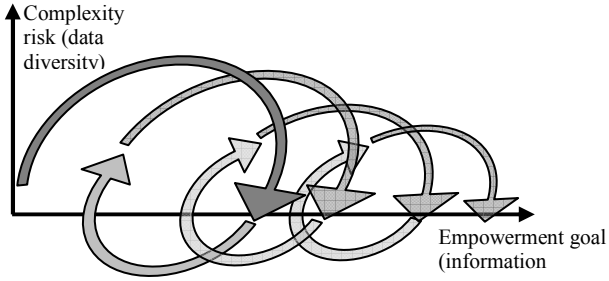

Figure 6 - During the Prototype design and development process various IT-Professional standard tools were applied, a Process methodology concept called Catalyst© from Computer Science Corporation (CSC) combined with a Content Management System for technical implementation. (Project design, 2005)

the contents are tailored both to the consumers' needs and demands, while remaining in accordance with best clinical practice.
The discourse of the patient as an active agent in managing illness and healthcare has become increasingly important in nursing. This recognition of the importance of patient empowerment and participation can be seen in the burgeoning research into patients' coping with healthcare problems, and increasingly powerful interest groups (Diabetics, Cancer etc.)
The discourse cannot be fully understood from within conventional scientific frameworks, because it requires a new orientation from health professionals. Instead, its current prominence can be understood by examining, how it meets the needs of those who use it in their everyday perspective.

Communication – conveying the message
When we see how the demands and requirements in communication are met, we realize the importance of context and experience of reception, and we have emphasized these elements in our research by having the user's every-day life as a key perspective along with the shaping or construction of the message within the communication model.
In view of our pursuit of empowerment, these Experience(s) could lead to a Sense of Coherence and subsequent result in a coping strategy motivating

visible/audible actions or silent decisions. If the users experiences, meets the demand for Meaningfulness there is a possibility of Empowerment, which can be applied both prophylactic or as a response to an immediate threat. This requirement is applied to the messages implemented in the prototypes, and will be the subject of the reception analysis when validating the prototype for traces of Empowerment.

Results

The resulting model is unique by coupling ICT with our professional nursing competences, and proving an impact of the exchange of messages through reception analysis.

Nursing Informatics

With the patients involvement in the description of relevant information themes, the basic question derived from the interviews or reception analysis could be "What issues are important to gain knowledge about?" In the workshops the nurses were invited to apply their professional skills to these themes with the empowerment strategy in mind. Nursing Informatics becomes a tool in the interdisciplinary understanding, which allows the nurse to take responsibility for the core nursing themes regarding the healthy and the diseased phase of the patients' lives, applying evident knowledge to the information design. The model iterative nature ensures the information's relevance is derived from the patient's perspective, and the professionals challenge the evident based content continuously.

The participating nurses became aware of their own role in the information cycle, and could reflect on the core nursing themes in accordance to the evident ideals of nursing. Being able to adjust to these ideals is central to the iterative nature of the model. By realizing this potential the nurses were given the opportunity to take their own themes serious, and find the energy to uphold the field of attention where the work can continue. The inspiration and desire to improve becomes the driving force in the continuing of the process.

Patient empowerment

By combining standardized iterative methods for software development, with research involving both healthcare professionals and patients/consumers we have succeeded in depicting a process where ICT can serve as a media in an empowerment strategy.

In the process of interviewing users and professionals, different message themes where discovered, and when implemented with an Empowerment strategy the communication facilitated by the technology resulted in traces of Empowerment. This is seen as nursing information about coping strategies were successfully integrated into the website prototype during the workshops. The subsequent evaluation of the prototype showed empowerment when the users' subjective reception of the content were analysed, and the usability of the design.

The process model is found to be useful both by a team of professionals and patients', resulting in the development of a website prototype empowering patients.

The iterative nature of the model has a dynamic and proactive approach to changes in the society. This means the model is integrating feedback about the cultural impact on language and technology. This is used to continually evaluate the socio-cultural relevance of the information and the chosen technology, as the health professionals iteratively evaluate and integrate the patients' point of views.

Therefore it is possible to support the prevention of injury and enhance health status after injury and surgery, without direct intervention of the healthcare system, as the individual is coping with the medical recovery process using an ICT media.

In this medical context, the information design supports the patient in assuming true responsibility for his/her own health by participating in the healthcare decisions. By sharing the responsibility with the health professionals in the empowerment strategy, they become empowered though involvement and influence rather than compliance to a dictated agenda of instructions.

Perspective

The model is validated in a large qualitative and quantitative study in 2006-2007 by the authors. This study has an expanded reference group due to the cooperation with Danish Gymnastic Association representing 1.3 million athletes.

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