Appliance of a Agile Pattern Language Framework for Harmonizing the Intercommunication of Research Results in the eHealth Domain

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Abstract

This article presents an approach for arranging, allocating and interchanging the gain in knowledge and experience during projects of the eHealth sector and related domains. The know-how is transcribed into design-patterns, whose concept has proven its effectiveness in versatile areas. A framework for specifying the pattern-structure that meets the specific requirements of the medical domain is defined.

Keywords:

Man-machine systems, Knowledge, Human engineering

Introduction

In times of demographic change, the development of (tele)medical systems with adequate assistance especially for elderly people becomes more and more important. Solutions to problems of the eHealth sector have to be ´reinvented´ although they were already solved in related domains. To improve this dilemma, the purpose of the pattern approach presented in this article is threefold:

- Designing of a semiformal model of a pattern language for assistance of elderly people with medical systems and the conception of medical devices in general
- Creating of a domain specific vocabulary to support internal communication
- Providing a framework in which novice can acquire domain specific proficiency, designers can express their ideas and experts can share their knowledge and experience

Pattern Framework for the eHealth Domain

Each pattern has a short *NAME* that communicates the central idea briefly, can be used as reference, and builds a vocabulary. The usage of medical terms should be avoided to ensure a common understanding. *RANKING* (max. three asterisks) reflects the pattern author´s belief in how valid the specific pattern can be applied for designing adequate assistance and how specific it is (i.e. whether it is one among many solutions or the only one available). The *CONTEXT* classifies in which phase of the medical process (check-up, emergency, hospital stay, rehabilitation, aftercare, etc.) the pattern is valid and therefore respects the particular demands of the patient/medical staff. The definition of a *TARGET GROUP* is momentous for this domain as it enables the reader to decide if the design pattern is adequate for his scenario. *USAGE SITE* defines the location were the scenario takes place. Next is the *PROBLEM* description. Here the definition of the conflicting interests and opposing forces regarding medical needs, physical limits/restrictions, cognitive psychology, social and economical issues, and individual preferences of the patients as well as the professionals is stated. Quintessence of each pattern is the *SOLUTION* section. It gives constructive recommendations that have proven to balance the conflicting forces in typical eHealth scenarios. To be significant, all involved (medical) equipment, technical auxiliary material, running period, activity sampling and the integration in clinical practice that were field tested have to be mentioned. An *ILLUSTRATION* in the form of a photograph, a sequence/operating diagram, or a technical draft helps to grasp an idea of how the implementation might look. In some patterns there might be *LIMITATIONS* because of spillover effects or contraindications in the context of several diseases that forbid an application in that case. The *REFERENCES* organize the isolated patterns to a pattern language by linking to additional patterns that are part of following process steps in the medical treatment or specific aspects that are inherent to the solution.

Statement of Innovation & Conclusion

Pattern Languages are best practice in most areas of the IT world and have proven their utility. In medical engineering this concept is to date not well known or commonly transformed. The application within a project on telemedical services for elderly persons showed its effectiveness for this purpose as well and therefore the concept is continuously evolved.

The results in research were transformed and restructured into a tentative pattern language that is used as a lingua franca for discussing and communicating the system design to all involved parties.

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