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PROSIT Disease Modelling Community
Open Source Development of Disease Models for Type 2 Diabetes

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Background:
Health economic decision analyses need reliable models for predicting future outcomes of health care decisions. Most of the available software programmes are "black box" models, which means that users are not able to fully understand the model independently of peer-review publications of structure and methods. Thus trust in models and health economic reports is difficult to obtain especially with physicians. There has been legitimate criticism with regard to quality and transparency of decision analytic models [1]. Going open source with models could close the credibility gap.

Aims:
Until 2010 the PROSIT Community ought to develop transparent and freely available disease models for type 2 diabetes mellitus, which includes: nephropathy, retinopathy, acute myocardial infarction and cardiovascular disease, stroke and diabetic foot syndrome. In the long run PROSIT shall serve as an electronic library for credible disease models for chronic diseases in the internet. The PROSIT Community obviously is the first initiative of its kind.

Methods:
The PROSIT Community was founded in June 2006 and used from the beginning the spreadsheet software OpenOffice Calc for developing models (Figures 2 & 3). Meanwhile 30 members from four European countries have made a contribution to currently three beta model versions. All members work without payment. The community is hosted since July 2007 at the University Heilbronn and is supported from staff and students from the joint course medical informatics of the University Heidelberg together with Heilbronn University.

The developers communicate via an internet portal (http://forum.prosit.de). The initial open source bulletin board software MyBB 1.1.2 (Figure 4) has been replaced in summer 2007 by the software Wikimedia (Figure 1). Both platforms allow exchange of documents, secure communication and transparent public discussion throughout the entire development process (Figure 2) [6]. The communication is entirely in English.

For PROSIT disease models the open source licence GPL-2 (GNU Public License) is applied [3]. Therefore, models are available free of charge. Also commercial use is possible without restrictions. According to the license, modifications and new model versions fall again under GPL and must be made available to the public. The PROSIT Community offers its infrastructure for these future developments. As a result of this "infectious" licensing model the models will last and cannot simply disappear again.

Results:
Currently models are under development for nephropathy, retinopathy, stroke and for diabetic foot syndrome. Development threads have been opened for the countries Germany and Romania. For nephropathy, retinopathy and stroke beta versions are available for downloading.

The development speed is rather slow as the voluntary members are not being paid and have individual private and business priorities, which make it difficult to coordinate a fast development.

PROSIT is a project of excellence for the OpenOffice.Org development community in Germany.

Discussion & Conclusion:
- Open Source for disease modelling is a new approach and experience has been raising. The Community approximates an increasingly effective development process.
- The potential of open source especially in Germany (health care reform 2007) is high as in Europe apart from efficacy, safety and quality the "4th hurdle" cost-effectiveness is being established. The duties of the German IQWiG Institute are to be enhanced under the current 2007 health care reform.
- All PROSIT models are in development. The first 1.0 version is to be expected for new year’s eve 007/2008. The models deliberately have a narrow spectrum of functions and can show low data requirements for instance in comparison to models based upon discrete event simulation.
- Summarising – PROSIT intends to achieve sustainability; leading models are available to the people.
- Transparency: the model development can be checked by the public at any time (avoiding "black-box" models).
- Creativity: a Community with members from currently four countries designs, discusses and controls the development.
- The Community invites professionals and students to become members and to contribute to the development.

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