Chapter 6
Methods for Software Complexity and Development Effort Estimation and its Importance in the Area of ICT Governance

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EXECUTIVE SUMMARY

The area of applications development for government purposes can be characterized to be task specific. In this context, development projects are usually more complex and there are some differences in comparison with commercial projects. The mission of the proposed chapter is an explanation of methods of project complexity evaluation based on analogy, crisp and fuzzy expert estimation and measure models. The selected methods for aggregation of expert's estimations are also presented. Further the chapter introduces selected methods designed for complexity estimation. All the introduced methods are widely known except one that was designed by the lead author of the chapter. The method is called BORM Points and is developed for an IS project designed in BORM method (Business Object Relation Modeling). Each method is introduced first, then its step-by-step computation procedure is described and finally suggestion of software, which is supported method computation procedure. The results of the methods are in non-dimensional numbers and it is necessary to set up the relationship between complexity and effort, and introduces COCOMO model and its variants. Efforts are given about the implementation of this form of estimation approach in the area of ICT governance, especially at the grass roots e-governance.

DOI: 10.4018/978-1-61692-814-8.ch006

ORGANIZATION BACKGROUND

Early SW systems were often developed uncontrolled without consideration about costs of its development and implementation. For that reason the development was not finished timely or costs of system implementation exceeded original estimations. The proper estimations of costs were finally enabled by emerging of methodical approaches of system design. For public information systems is important the public funds were spent efficiently and the utility of public information systems for grass roots was as high as possible. The main specific of public information systems is a fact that they are primarily not created for the purpose of increasing of company's profit, but for the purpose of providing public services to citizens. They should simplify the contact between citizens and government.

This case summarises current knowledge related to effort estimations constructed in early phases of IS development project. These estimations enable to make decisions, wheatear to invest money in the project or not. The case contains knowledge, experience and results of researches of several authors, who are on a long-term basis involved in the area of effort estimations.

This case does not describe a particular solution in comparison with others. It follows one selected, but quite important problem "automation" of public administration, concretely cost estimation for information support of public administration's projects. It summarizes authors' experience from various projects, in which authors have participated as resolvers or submitters. Next authors' experience is from pedagogical work at the universities including cooperation with post-doctoral students. Finally it includes experience from international standardization on the level of standardization authority - ISO/IEC JTC1 (Join technical committee for Information technology) and its subcommittee SC7 (System and Software Engineering), where one of the authors has worked as a representative of Czechoslovakia and as a representative of Czech Republic since 1993. His main role is a coeditor of international standards.

Next authors' background consists of long experience with leading of project in the area of development of operation systems and base software for mainframe computers, then experience with public procurements and management of many government and public projects in the area of public administration and government, especially for Government office for public information systems of Czech Republic and later for Ministry of Informatics of Czech Republic.

Currently, authors' research activities are based on projects for Czech Ministry of Education: Grant No. MSM 6046070904 ''Information and knowledge support of strategic control" and Grant No.2C06004 ''Intelligent tools for content assessment of relevance of general and specialized data and knowledge resources".

SETTING THE STAGE

Why Should Complexity be Estimated?

If government wants to successfully develop the Information and Communication Technology (ICT) support, it has to accurately and appropriately react to citizen's needs and demands. Government representatives should try to optimize expenses of information systems (IS) including subsequent implementation and operation activities. The public sector is responsible for the effective usage of funds received from the taxpayers. They should, therefore, guarantee that benefits of the deployed IT surpass the related costs of system development - especially for software. Furthermore, government needs to determine objectively whether the price of work, which is demanded by external developers, corresponds to the labor consumed during the project realization. Therefore, it is vitally important to dispose of methods for work effort estimation and to have tools for