PEGS: a new method of requirements and business analysis

Bertrand Meyer and Jean-Michel Bruel

***Abstract*—Bad software requirements can jeopardize projects. There is a considerable literature on requirements, but practice is far behind: what passes for requirements in industry usually consists of a few use cases or user stories, which cannot do the job. Can we fix requirements engineering (known in other circles as business analysis) so that it is no longer the weak link in software engineering? The goal of this tutorial is to present ongoing work intended to help industry produce more useful requirements. It includes precise definitions of requirements concepts and a standard plan for requirements specifications, intended to replace the venerable but woefully obsolete IEEE standard from 1998. The plan contains four books covering the four "PEGS" of requirements engineering (which will be explained). The approach builds on existing knowledge to define a practical basis for requirements engineering and provide projects with precise and helpful guidelines.**

I. Motivations and objectives

This tutorial will provide the attendees with concrete and immediately applicable guidance towards better requirements engineering. It will introduce the four "PEGS" of requirements engineering: Process, Environment, Goals, and System, which will be explained and illustrated.

II. Format and services

In this half-day tutorial, we will focus on the following topics:

- Requirements principles
- Standard plan for requirements
- Quality assessment for requirements
- Object-Oriented and formal requirements

We propose to follow a hands-on approach, where participants will experiment the different concepts directly using prepared material. The audience is expected to work on the exercises using their own laptops, where some tools must be installed in advance. We will provide a link to a public repository containing materials, exercises and setup instructions. As the conference is virtual, an Internet connection will be mandatory during the tutorial to access to the materials and to follow the online presentations and discussions.

III. Target audience

The target audience are software engineers, modelers, requirements engineers, or teachers. The first key idea of the tutorial is to allow curious RE practitioners to experiment a complete and practical requirements organization approach. The second key idea is to reconcile software developers with requirements engineering, by concretely illustrating how useful they can be for the development of quality software when well organized, written, and made useful.

IV. Tutorial history

This tutorial has never been proposed as the presented method is the subject of an upcoming book by Bertrand Meyer. Only an upcoming ACM Webinar will address shortly the method[1]. The authors have never experimented this particular format but they have long experience on the concepts that will be introduced and experimented by the attendees. They have also a good experience in workshops collaborations and animation. This tutorial proposal is built on top of a five years collaboration on formal requirements [3], [2], [1].

V. Presenter's bio

Bertrand Meyer is Head of the Chair of Software and Security at Schaffhausen Institute of Technology, Professor of Software Engineering (emeritus) at ETH Zurich, and Chief Technology Officer at Eiffel Software. His latest two books are: Agile! The Good, the Hype and the Ugly (Springer 2014), a presentation and critical analysis of agile methods; and Touch of Class: Learning to Program Well, Using Object Technology and Contracts (Springer 2009), an introductory programming textbook based on several years of teaching introductory programming at ETH and Innopolis. His upcoming book on: Handbook of requirements and business analysis, describes the complete method introduced in this tutorial.

Jean-Michel Bruel is Professor at the University of Toulouse (France). He is leading the SM@RT team, specialized in models and language engineering. He has animated several tutorials at MODELS or RE. He has been teaching Agile Methods, Requirements Engineering, and Model-Based Systems Engineering for more than 12 years.

VI. Publicity

Both authors have been chairs or publicity chairs of major conferences such as TOOLS, MODELS, or RE. They are also involved in requirements and software engineering communities. Hence they will intensively promote the tutorial through their networks (e.g., mailing lists, twitter).

References

[1] Jean-Michel Bruel, Manuel Mazzara, and Bertrand Meyer. *Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment*. Number 11350 in Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment. Springer, 2019.

[1] See https://To.Be.Completed.

[2] Bertrand Meyer, Jean-Michel Bruel, Sophie Ebersold, Florian Galinier, and Alexandr Naumchev. Towards an anatomy of software requirements. In Manuel Mazzara, Jean-Michel Bruel, Bertrand Meyer, and Alexander K. Petrenko, editors, *Software Technology: Methods and Tools - 51st International Conference, TOOLS 2019, Tatarstan, Russia, October 15-17, 2019, Proceedings*, volume 11771 of *Lecture Notes in Computer Science*, pages 10–40. Springer, 2019.

[3] Alexandr Naumchev, Bertrand Meyer, Manuel Mazzara, Florian Galinier, Jean-Michel Bruel, and Sophie Ebersold. AutoReq: expressing and verifying requirements for control systems. *Journal of Visual Languages and Computing*, 51:131–142, apr 2019.