

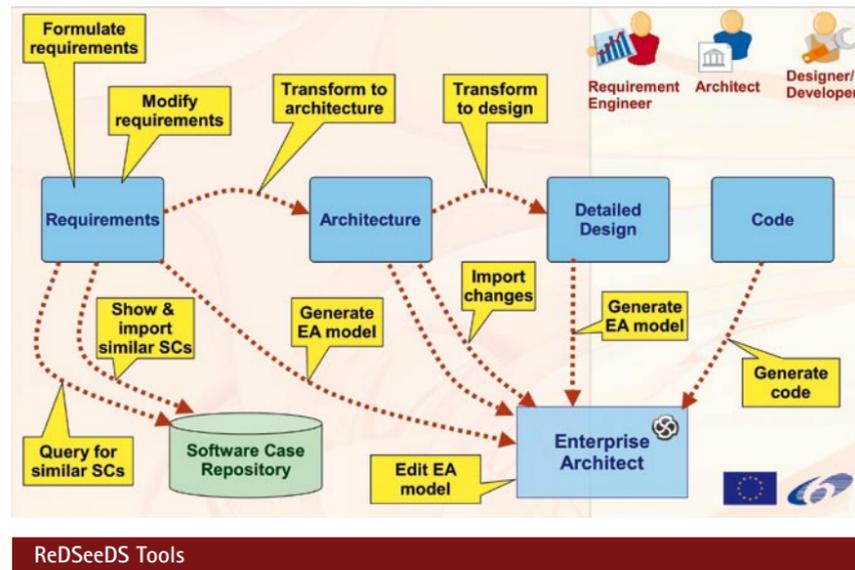
★ The software development industry is one of the key drivers of a modern economy, and yet, since its very inception, the entire industry has been plagued by a chronic inability to deliver projects successfully. **Michal Smialek**, leader of the ReDSeeDS project, believes they have a solution

A new approach to software development

According to the Fender groups, who produce statistics on the 40,000 software development projects undertaken globally, the majority of projects fail to deliver software on time, within budget and having fulfilled all agreed requirements. In fact around a quarter of the projects are cancelled entirely. This is clearly an unacceptably high level of failure, to the degree that it threatens to undermine the entire industry. At the root of this problem lies the complexity of the requirements which developers must aim to deliver. As Michal Smialek, the project leader of the ReDSeeDS project observes, “software is complex, and it’s very difficult to fully describe software requirements. Unless measures are taken to describe software requirements and enable the kind of automation or tooling support to transform these requirements into the final system, this complexity becomes problematic.” This is where Smialek hopes ReDSeeDS can help to improve the current calamitous situation.

Tool for developers

ReDSeeDS stands for Requirements-driven software development system, an innovative framework, developed by Michal Smialek and his team. “Primarily” Smialek explains, “our project is about producing a special tool for software developers. Initially this tool is meant to assist them in creating what are known as software cases, which are a combination or requirements, design and code of the software system. The secondary function” Smialek continues, “is to enable the re-use of such software, so when a developer wants to produce a new system, they can re-use parts of these old software cases, which would be stored in the repository of



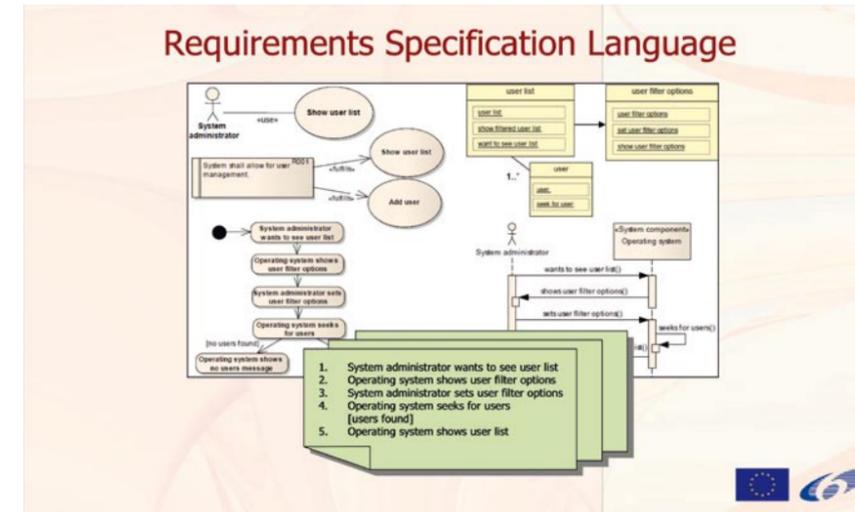
that tool.” By facilitating the re-use of software, Smialek hopes to go some way toward helping overcome the wide-spread industry failures often caused by time constraints and budgetary restrictions.

Though created specially for developers, the tool is comparatively uncomplicated, whilst retaining a high level of specificity. “When a developer formulates their requirements for a new system in our tool, then they can simply press a button and the tool replies with a list akin to a search engine results page” Smialek discloses. “this will show all the relevant tasks and artefacts, such as design and code, which can be re-used and employed in the new system. Furthermore, one of the really innovative elements of the tool is that you can then go back to the old requirement specifications and, with the click of a button, the tool will display all the traces from the change requirements to the code that is behind

these changed requirements.” The only real drawback of the tool is its incompatibility with processing results from existing systems created without the tool. However, this merely serves to underline the need for a framework such as ReDSeeDS. The reason the tool cannot accommodate the results of existing systems is that artefacts produced by them are not structured with sufficient organisation to be re-usable; it is this very lack of organisation and specificity within current software development systems that ReDSeeDS attempts to address.

Requirements made clear

One of the main problems in software development is that requirement certifications are written using ambiguous terminology. ReDSeeDS allows users to specify their needs in a way that utilises algorithms which enable automatic, or at least partially automatic, transformation to



design artefacts and to code. “This is another feature of the tool” Smialek enthuses, “it enforces an explanation of all the terms used at the requirement stage. This is very important because all the terms that are used in the requirement stage have to be explained by attaching them to a global vocabulary of the English language, which contains all the possible definitions of the various characters. It is important that the vocabulary is not produced by the project, it is a global vocabulary of the English language.” The software responds directly

in industry, non real-time systems, but the number of domains in which the platform could be utilised may prove further reaching than its creators foresee. Having validated their methodology with their industrial partners, the project is currently in the process of transforming the tool into an open-source platform. Development is ongoing and despite having partners in Germany, Latvia, Poland, Lithuania and Turkey, Smialek is keen to welcome any partners willing to join the team and develop this work on the open-source

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to this scenario-driven development. By increasing the level of specificity at the requirements stage, the software developers have a greatly improved opportunity of ensuring the compatibility of their end product with the user’s needs. Furthermore, this aspect of the tool’s functionality does not only improve the developer’s ability to meet requirements. By imposing limitations on the complexity of vocabulary with which requirements may be expressed, clients themselves may develop a broader understanding of what their needs actually are and how they might be deliverable.

The framework is designed primarily for the more typical business systems found

platform. Such pragmatism in delivering the tool in this way may yet prove to be project’s most significant asset. As Google, Linux et al. have shown in recent years, success in the age of cloud-based storage and Web 2.0 is dependent on allowing communities to use platforms as they want to use them. This is why it is so vital that Smialek is working closely with people like Semih Cetin, the President of Cybersoft. By collaborating with industrial partners, the ReDSeeDS project, much like the framework itself, is able to look beyond its own objectives to fulfil effectively the requirements of the users it has been developed for. ★

At a glance

Full Project Title
ReDSeeDS – Requirements-driven software development system

Project Partners

Infovide-Matrix S.A. • University of Koblenz-Landau • Warsaw University of Technology • Hamburger Informatik Technologie Centre e.V. • Heriot-Watt University • Institute Of Mathematics and Computer Science, University of Latvia • Vienna University of Technology • Fraunhofer-Gesellschaft • Algorithm sistemas • PRO DV Software AG • C/S Enformasyon Teknolojileri Limited Sirketi (Cybersoft)

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Michal Smialek holds a habilitation (higher PhD) degree in informatics. He is currently an Associate Professor at the Warsaw University of Technology. Since 1991 he has gained experience in software engineering as a developer, expert consultant and teacher. He has published over 60 articles and a book on UML.

