

Tough times, complex systems -- a modernisation story

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(PhysOrg.com) -- Tough economic times call for tough measures to remain competitive. That goes for software modernisation as well. A European project has just released a prototype of a software engineering platform that could help companies save time, money and energy as they scramble to upgrade complex IT systems. The timing could not be better.

To compete globally in today's [economic climate](#), IT and software systems need to be up to date and functioning perfectly. But for most organisations, it is not as simple as just replacing a desktop or buying in new off-the-shelf software.

Manufacturers, for example, run a host of [complex systems](#) - characterised by interconnected hardware, software, user interfaces, firmware, and business and production processes - controlling everything from supply and production to the temperature in the canteen. And the systems could well have been installed at different times by different suppliers and with a number of tailor-made adjustments along the way.

These “legacy systems”, as they are called, are IT nightmares and the reason so many organisations decide to just throw out the lot and start again, wherever possible. But times are much tougher nowadays.

IT budgets, like the rest of the company operations, are being slashed. The question management must now ask is, why invest in a totally new system when the basis for modernising the system is there? This is where European researchers in the MOMOCS project enter the picture.

“If you are going to modernise, of course you need to deal with legacy issues,” says Alessandra Bagnato of TXT e-solutions in Italy. “Let’s face it,” she says, “in this current economic climate modernisation of complex system is a very good way to remain competitive.”

The savings to be made through the modernisation of current systems are significant.

From ugly sister to belle of the ball

Once upon a time, modernising a system meant more trouble than it was worth; it was the ugly sister of IT development. But the current economic crisis has given new impetus to this field.

Yet with such complex systems and software, the problem is where to begin. If you change one component and don’t have a proper overview of how it will impact other, potentially critical components, the results can be devastating.

MOMOCS’ solutions are ideally suited to fast reengineering of the software portion of complex systems.

The goal of the EU-funded MOMOCS project was to make modernisation much easier, cheaper and faster than ever before. And allowing the end-user to concentrate on what to do rather than on how to do it is critical to this. Current approaches like the Rational Unified Process, Extreme Programming, and Scrum are thought to be too generic and mostly designed for “green field” projects.

The solution? MOMOCS has just finished developing what it calls an ‘Extreme End-User-Driven Process’ which is dedicated to software and systems engineering for modernisation, such as adding new functionality to an existing system. Tools that the project developed can model

existing systems before the modernisation begins and keep track of the different models and their transformations in a dedicated knowledge base.

Case in point

Two cases were developed - one for automation, another for telecom and computing infrastructure - to test the MOMOCS suite of tools.

Take, for example, automated baggage-handling systems when air traffic begins to spike. Most components might be coping well, but the storehouse is overflowing. So, an upgrade is needed, but only to the storage capacity components. MOMOCS can isolate exactly what needs changing and so minimise disruption.

First, MOMOCS creates a model of the “to-be-modernised system”, which gives an overview of the existing architecture and business logic, and identifies the critical parts. It highlights components that can be reused and lays down some predefined transformation rules to expedite the changeover - all recorded in a special components library. The MOMOCS engineer goes through the “what-if” scenarios, in view of constraints and customer requirements, and comes up with a fairly accurate cost estimate of the given modernisation project.

Handled more efficiently, modernisation of existing systems has a number of advantages - easier, cheaper, more transparent, better quality results - over wholesale upgrades or piecemeal changes using unsuitable tools and methods.

But perhaps the most important benefit comes in the wake of the modernisation, thanks to across-the-board improvements in company productivity.

Surprising clarity

“I was initially surprised at the amount of detail in the models we got from our industrial partner Siemens during the testing of the MOMOCS tool suite and methodology,” says Bagnato, the project coordinator. “We are talking about very complex systems and yet the MOMOCS-generated models were able to pinpoint the different parts.”

Showing the different perspectives and relationships in the model means the engineer can select only the parts in need of modernising, notes Bagnato, such as all the electrical systems on the shop floor, or the switching systems in the warehouse.

Perhaps the best thing about MOMOCS, though, is that the results will not sit in a trophy case somewhere in Italy or any of the four participating countries. A final beta of MOMOCS is already available on the project website and parts of its tool suite are to be published on the MoDisco website.

Now that the two-year MOMOCS project has ended, most of the nine partners from industry and academia are keen to continue research in the field to refine the tools. Their work in standards is also an ongoing process.

The MOMOCS’ team has recently met with the leading Object Management Group (OMG) in the USA about gaining recognition of its Architecture Driven Modernisation (ADM) approach, and its work on Knowledge Discovery Meta-models (KDM) has also broken new ground.

More information: www.momocs.org/

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