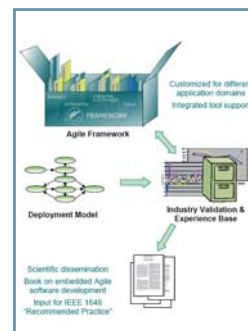
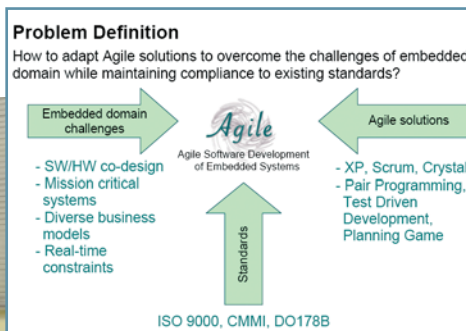


Fagor Automation and the **Agile** project



Interview with
Mr. Marcelino Novo
Technology manager of
FAGOR AUTOMATION

The project named "AGILE Software Development" will conclude on December 31st, FAGOR AUTOMATION has taken part in it as a cooperating member. Other companies and organizations have also taken part in this project (such as NOKIA from Finland, PHILIPS from Holland, etc.) from 9 European countries (Belgium, Bulgaria, Slovenia, Spain, Finland, France, Holland, Italy and Ireland). Mr Marcelino Novo, technology manager of FAGOR AUTOMATION, has directed this project in this company. We asked him to explain this project, the reasons for creating it and the benefits we expect in the medium-to-long term.

Q. What does the name of the project, AGILE, mean?

The word AGILE corresponds to the initials of Agile Software Development of Embedded Systems. This project is within the EUREKA-ITEA program and began on January 1st 2004.

Q. Which goals were set for this project?

The goals of the AGILE project are to accelerate the development of products containing a lot of embedded software, achieve a balance between time-to-market and development costs, and provide a faster response to the changes that take place in the developing stage. This can be achieved by applying AGILE concepts (methods, techniques, tools, practices)

when developing software for embedded systems. The main goal of the project is to develop an agile developing framework for the embedded system environment that takes the existing standards into account. By later expanding and using the AGILE framework, we will try to proof its functionality and the efficiency of the AGILE approach. To do that, we will develop several pilot projects and take measurements of them.

Q. Why was it found necessary for FAGOR AUTOMATION to participate in this kind of project?

Because there were and still are some control software related problems that had to be solved:

- The complexity of control systems.

- Open systems have replaced the closed ones (proprietary HW and SW).
- Shorter and shorter life cycle.
- Greater importance of information technologies (connectivity).
- Distributed control systems with elements connected through a network and field buses.

Q. What makes it so complex and large?

These problems are due to the characteristics of the control software. It is getting more and more complex, it is required to be safe, flexible, configurable and, at the same time, capable of incorporating new features. On the other hand, the quality requirements are more and higher (for example IEC-61508-3), the developing times must be as short as possible and with more and more demanding requirements in terms of performance and availability (a useful life of 10-20 years with a minimum number of stops).

Our main contribution has focused on the WP2 (Framework for Agile development of embedded software) and especially on the WP5 (Industrial application)

Q. You have mentioned generic goals of the AGILE project. Could you tell us a more specific goal for FAGOR AUTOMATION?

Basically, we can mention 4 points:

We mentioned that we look for shorter and shorter development periods. With the AGILE project, we are trying to shorten the development cycle for new versions from the current average of 9 months down to 3 months.

We are also trying to improve the software validation deadlines by reducing the required effort 80%. All this without jeopardizing final quality

in the least. On the contrary; we expect to improve the quality of the software reducing the number of errors in half.

Finally, we expect to increase the productivity of our development teams 10%.

Q. And what will these 3 years of work and cooperation translate to? What benefits can we expect from this project?

The benefits are important both in terms of quality and quantity. In the first place, we will achieve what may be the most important for our company; increase customer satisfaction since we will obtain more reliable products.

But also, the company itself will benefit from this project because we expect savings of up to 170,000 Euros a year and a 5% sales increase. All this will translate into a yearly profit increase of 500,000 Euros.

Q. And finally, how has FAGOR AUTOMATION participated in such an ambitious project?

FAGOR AUTOMATION has dedicated 670,000 Euros to this project and an equivalent to 8 man-years in R&D effort. The departments most involved in this project have been "R&D" and "Software Quality Assurance".

Our main contribution has focused on the WP2 (Framework for Agile development of embedded software) and especially on the WP5 (Industrial application) by implementing good work practice and making 3 pilot projects.

An embedded system is a specialized system where the calculating unit is encapsulated into the control device itself. Unlike general purpose pc's, an embedded system performs a number of specific tasks to meet very specific requirements. Embedded systems are part of our daily lives and may come in different types and sizes. Just as an example, we'll mention some of the possible applications:

- Cell phones, photo and video cameras.
- Automatic teller machines, sales terminals, internet kiosks, etc.
- Playstations, MP3 players.
- House appliances, domotics (microwave ovens, DVD's, TV sets, washing machines, air conditioning, thermostats, alarm systems).
- Medical equipment (microscopes, magnetic resonance equipment, surgery robots).
- Flight control systems, missiles.
- Calculators, PDA's, printers, modems, routers.
- On-board computer in cars, ABS, GPS.
- Control systems for traffic, machine tools and robots or cells and manufacturing plants.

The software of embedded systems is usually known as firmware and has the following characteristics that differentiate it from normal applications:

- It interacts directly with hardware systems.
- Its resources are usually limited (little memory, just enough CPU power, etc.) for cost reasons because many of them are manufactured in large quantities with considerable savings.
- Some times, there is no interaction with the user and, consequently, they must run without errors for years and be capable of self recovery when errors due occur.
- Other times, they may interact with the user through a very simple display with a just few keys or even through a full user interface based on windows similar to those of a PC.
- In certain applications, the embedded systems must be able to respond immediately and meet real time requirements for safety reasons (mission critical systems). Safety and conformity certificates with certain standards are often needed.
- Embedded systems usually need to be developed by different specialized teams (software, hardware, mechanics, telecommunications, etc.).