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OOTI Projects at Elektroson

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The last hurdle that separates an OOTI from being an ex-OOTI is the final project that concludes the OOTI programme. Two OOTIs took on the challenge and performed their final project at Elektroson, a small company. An overview of their experiences is described here.

In November 1994, Elektroson was in need of two qualified software engineers who could readily fill up the shortage of human resources within the company. After a brief search, they ended up at the OOTI room of the TUE. Soon, two distinct projects were defined, both meant to be carried out by one OOTI.

Company profile

Elektroson is a small independent Dutch software house, operating in the international marketplace. The head office in Eindhoven employs about 20 people. Besides Eindhoven, Elektroson has offices in the USA and Japan. The core activity involves Compact Disc (CD) recording technology.

In the R&D (Research & Development) division, five software engineers are employed working on standard publishing tools to put any data on CD-R (CD Recordable). One of these tools is GEAR, an advanced software package used for multi-media premastering and in-house or commercial low-volume publishing activities on CD-R.

In the P&S (Projects & Services) division, five software engineers are employed working on customer-specific CD-ROM titles in the electronic newspaper market, including low and high-volume CD replication. Development is done on customer order. Customers of P&S are mainly newspaper publishers. Also, commercial aspects such as packaging and distribution can be handled by P&S. In the M&S (Marketing & Sales) division, three employees are responsible for positioning and selling the product GEAR worldwide. Therefore, marketing campaigns are used to further increase the volume of sales. Three kinds of customers can be distinguished, namely VARs (Value Added Resellers), distributors, and OEMs (Original Equipment Manufacturers).

Project goals and realization

As mentioned above, two different OOTI projects were defined. One project was carried out in the P&S division, the other project was carried out in the R&D division.

The project carried out in the P&S division involved the development of a commercial application for the retrieval of information from databases which are stored on CD-ROM. Development was done using a multi-platform user interface development tool. Indexing software was used for data preparation of electronic information. Retrieval software was integrated in the application for the disclosure of CD-ROM databases. The retrieval software was modified in such a way that multiple databases can now be accessed.

The project carried out in the R&D division was aimed at designing and implementing a commercial GUI (graphical user interface) for GEAR on UNIX. A user interface has been developed for GEAR for every platform which is supported. However, all UNIX platforms currently supported have a command line interface. It is Elektroson's intention to supply a GUI for



Figure 1: Organigram of Elektroson

every platform supported. As a starting point for the design, the GUI for the MS-WINDOWS version was chosen. Given the design, an implementation for SOLARIS 2.3 was realized. Implementation was done using a multi-platform user interface development tool. At this moment, it is the intention to port the SOLARIS version to all other UNIX platforms. The problem of porting the software is expected to be manageable, due to the use of a multi-platform user interface development tool. As a first porting case, the SOLARIS version was ported to the OS/2 platform. This case turned out to be very successful.

Project environments

In order to be able to guarantee and maintain the quality of the application development process, and hence of the application itself, the P&S division develops according to the following development methodology.

Requirements and functional specifications of the application are defined in close cooperation with the customer. Based on this information, first a prototype is developed. After evaluating the prototype, requirements and functional specifications can be refined. Finally, the application is developed and tested.

This results in the following sequence of

application development phases.

- 1. Analysis
- 2. Offer
- 3. Prototype development
- 4. Evaluation
- 5. Application development
- 6. Testing
- 7. Acceptation
- 8. CD production

Unlike P&S, R&D does not work on a project basis. As a consequence, the development process and way of working is different to that of P&S. In many cases, the Marketing & Sales division has a list of 'nice to have features' and other commercially important aspects. These are reviewed with the R&D manager, which results in a final requirements list. These requirements are given to the software developers responsible for the development of the product. It is the developers' task to find solutions which meet the requirements. In this stage, the developers are free to apply any useful method they think is necessary to reach a solution. In the end, it may be necessary to meet with Marketing & Sales for a final decision on which solution will be chosen. The next step is the development of

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an alpha version of the product. This version is tested extensively, both in-house and externally. The results from the test are used for alpha improvements, which eventually result in a beta version. Finally, this beta version is run through an acceptance test, after which the product is ready to be released.

As we see, the R&D division is driven by input from Marketing & Sales, hence R&D is market driven. Since the market frequently changes, the input from Marketing & Sales frequently changes. As a consequence, development schedules change on a regular basis. The challenging part, apart from technical difficulties, is to keep this situation manageable. The P&S division, on the other hand, is customer driven. Requirements are usually defined in an early stage and mostly remain unchanged. Therefore, schedules tend to be more stable than in the R&D division. The challenging part, again apart from technical difficulties, is to meet the deadline which was agreed upon with the customer.

In both divisions, project management and configuration management have proven to be useful and necessary. However, due to commercial pressure, activities concerning specification, design, and documentation often do not get the attention they deserve. This has consequences for the reusability, extendibility, and maintainability of software. Also, a great deal of technical knowledge resides only in the minds of individual people, due to little documenting. As a consequence, individuals become important 'information databases' and hence, vital to the company. Furthermore, due to the size of the organization, there is no dedicated internal support, for example network support. Consequently, employees need to be flexible in their work and are usually responsible for a wide range of activities.

Small company profile

It is hard to conclude whether the environment described above is typical for small companies.

However, it is more likely that the described situation exists in a small company rather than in a large company. Although it is difficult to give a general characterization of a small company, we try to do so anyway. A small scaled company has

- a small number of employees (< 30),
- tight schedules, and hence overtime is more likely,
- little or no formal (design) methods in use,
- little documentation activities,
- little hierarchy, and hence few steps to the top,
- limited financial possibilities, and
- no dedicated internal support organization, requiring flexibility from employees.

OOTI profile

Consider an average OOTI and his or her skills. These skills, which are a 'mixture' of personal skills and skills obtained through the OOTI programme, can be subdivided into technical skills and social skills. One can expect the following technical skills.

- Analyze problems
- Specify solutions
- Make a design based on structured or objectoriented methods
- Implement the design
- Short learning curve
- Make documentation
- Perform project management and configuration management

One can expect the following social skills.

- The ability to work in a (multi-disciplinary) team
- Adapt quickly to unfamiliar situations
- Communicate information

Mutual benefits

An OOTI is trained to analyze problems, specify solutions, make a design, and document the design and resulting implementation. Hence, when given the opportunity, an OOTI can illustrate what software development is about. When following the software development approach, reusability, extendibility, and maintainability of software will in turn become more easy than before. This also holds for environments where commercial pressure is common. In the end, this will improve the competitive edge of any company, including a small ones.

Small companies can offer OOTIs the following.

- The possibility to introduce new techniques and methods.
- An environment where you are responsible for a wide range of activities.
- The 'we-feeling' (you are not one of many).

OOTIs can offer small companies the following.

- The skills mentioned earlier, both technical and social.
- New techniques and methods.

Conclusion

In an environment in which problem analysis and design methodologies are rarely used, opportunities arise for OOTIs. In this case, they can illustrate what software development comprises of. Also, they can introduce techniques and methods regarding specification, design, and implementation.

We both look back at a successfully completed project. Although the specification and design aspects of both projects were limited, the atmosphere of a small company, working in a team, and undergoing commercial pressure have been valuable experiences to us.

References

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