Software Process Improvement
Case Study

Documentation of lifecycle process within a small software development company

Overview

Linné Skola & Omsorg System AB is a small manufacturing and consultancy company which develops and markets systems, primarily for administration in the education and care sectors. The staff possess a high level of expertise, they are very enthusiastic, and the work is stimulating and educative. The company deals with everything from developing new applications to devising technical solutions for databases and communications.

For this multifaceted business to function effectively, we need working methods and organisational structures that support the complex environment in which we operate. We have largely lacked these hitherto, which put staff and communication with customers under considerable pressure.

A first step towards changing working methods and organisational structures was to chart and document the company's lifecycle process through the SPIRE project and, on this common basis, to construct a new organisation with clearly defined roles and responsibilities.

The opportunities we had in the course of the project to discuss problems and solutions with an experienced mentor and devise a blueprint for an effective working method proved highly educative for everyone within the company. We are now confidently looking forward to applying our experiences to future activities.

The Organisation and its Environment

Linné Skola & Omsorg System AB develops, markets and maintains administrative systems for local authorities, primarily in the education and care sectors.

The business, which became a separate company in 1995, has its origins in customer-specific development projects undertaken by the LinnéData consultancy company. At the request of the original customer, a cooperation agreement was signed, under which Linné Skola & Omsorg was formed and, together with its partner, took responsibility for selling and maintaining this first software application.

Linné Skola & Omsorg is 40% owned by LinnéData, with a number of employees holding the remaining shares. We currently have seven members of staff and a turnover of around SEK 5 million.

The concept of administrative systems was initially very successful, with a number of major client-server applications being developed and marketed.

The original customer took responsibility for a large proportion of the development costs, as well as for specifying requirements and providing operational know-how.

Within three years, Linné Skola & Omsorg had produced four major systems:

- Administrative system for upper secondary schools (pupils, courses, marks, staff records etc.)
- Administrative system for primary/lower secondary schools
- System for childcare institutions
- System for geriatric care institutions

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In developing these four systems, we subcontracted some of the work to consultants from our parent company, but we gradually recruited staff of our own. About 20 systems were sold to local authorities throughout Sweden, thanks mainly to our ability to offer modern technical solutions.

Starting point

The success of the systems sold led to an expansion of the company, and by early 1997 we had seven employees: four developers, a project manager/co-ordinator, an administrative officer and two sales representatives (one full and one part-time).

Forced, short-term solutions

Despite the expansion, the non-chargeable part of the development and maintenance processes, which involved rectifying faults, was growing. At the same time, the requirements and expectations of our customers were increasing. The workload on staff was growing, and all employees were working at full capacity within their field, yet overall performance continued to deteriorate.

The various initiatives were often of a very short-term nature, dictated by sales or customer requirements. New tools and technical solutions were being used without any long-term assessment of consequences. Various views on the best working methods were voiced but yielded no results, merely a realisation that a fundamental programme to chart working methods and processes needed to be devised and implemented.

Unstructured consultancy

Most members of staff at Linné Skola & Omsorg have obtained both their training and their professional experience within IT consultancies, where the duties generally involve time-limited development projects. The customer is responsible for specifying requirements, providing operational know-how and maintaining the systems developed.

Consultancy companies are focused on the development process (technology, calculations, schedules, steering groups, costs etc.). Working procedures and methods are designed around this type of process, which the organisational structure is also intended to support.

In a comparatively fast-growing organisation, in which expansion has to be self-financing, the definition of roles will be determined by short-term tasks. People "end up" in various positions and have difficulty in taking a holistic view of the company's workflow. Different departments, e.g. sales, development and maintenance can be pulling in different directions.

As a consequence of this working situation, individual links between different applications and the interests of individuals often tend to take priority over the company's long-term objectives, which are sometimes poorly formulated.

Deficiencies in the business

Where Linné Skola & Omsorg was concerned, we recognised that our business was suffering from several deficiencies, above all the following:

- Our working methods – whether internal or customer-facing – were not good, and their quality had been neglected for a long time.

- The division of responsibilities was unclear, and there were no clear rules on who should do what.

- We needed to clarify what objectives we were working towards and what improvements we needed to make in working climate, finances, products and so on.

In short, Linné Skola & Omsorg was characterised by an unclear organisational structure and division of responsibilities, leading to inefficient working methods and deficient quality. The chance to make improvements through the SPIRE project therefore came at an opportune time.

The Improvement Project

For Linné Skola & Omsorg, the SPIRE project comprised a detailed examination of the company's entire operations. Consequently, all employees were involved in the process, which we hoped would result in uniform, more structured and better organised working methods.

Through the project, we also hoped that all employees would feel they had contributed to the outcome and that it would gain acceptance among all the staff. We hoped to produce documented working methods with explicit areas of responsibility.

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Graphic depiction of the operations of Linné Skola & Omsorg

During the planning of the project, it seemed natural to attempt to produce a graphic depiction of our lifecycle process, on which basis we could clarify the elements constituting each stage of the process. Since part of our work involves complete development projects and part involves modifications to existing products and systems, we have tried to cover everything in our lifecycle process.

To organise our contribution to the SPIRE project, a project manager was appointed with responsibility both for group activities and for individual discussions, and for collating the results we obtained.

First we selected the tools to be used and sketched out a rough draft of the proposed solution. This was discussed, improved and put in place step by step over several months. The proposal was supplemented with a description, for every stage of the lifecycle process, of what the process involved, which documents and information were used in the process, and what was issued. For instance, we specified which documents had to be produced or filled in, both at overall company level and within individual projects.

In addition, the views of experienced and newly qualified consultants had to be taken into account. Last but not least, we had to reconcile theory and practice in a single model.

The Results

Quality and efficiency improved during the SPIRE project, as our lifecycle process gradually became established among staff. Some stages of the process are already being implemented, while others have been delayed pending clarification of the division of responsibilities. As soon as

this is clarified, which will be during autumn 1998, we shall be introducing the process in stages for purely practical reasons. By the end of the year, we aim to have implemented everything we have devised to the maximum possible extent.

Consequently, improvements will be incorporated as part of a living process.

Faster induction of new staff

The first tangible proof of the benefit of Linné Skola & Omsorg's lifecycle process has already become apparent in relation to the induction of new members of staff. They now become familiar with our operations much faster, since we are able to provide a clear overview of the various processes, how they fit together and the requirements concerning quality and documentation.

Another area in which we have already seen an obvious improvement is work orders and contracts with customers relating to customisation projects or further development of modules. Clear rules have been drawn up for processing enquiries, estimates, orders and final approvals.

This process of improvement has been made significantly easier by the fact that documents can be sent quickly and efficiency to and from customers by e-mail.

Improved organisational structure and division of responsibilities

As a result of the SPIRE improvement project, Linné Skola & Omsorg now has a very flat organisation with no superfluous tiers or managers. The underlying concept is that employees know their field and want to take responsibility for it.

In the event of operational changes (e.g. new products, technology or staff) it is important for employees to readily find their new role. The lifecycle process assists in discussing and defining a new organisational structure with new responsibilities and powers.

At present, Linné Skola & Omsorg is engaged in improving its organisational structure and division of responsibilities. It is precisely this ability to restructure quickly to meet new challenges that we see as one of the preconditions for survival in the IT industry.

Lessons Learned

We have partially achieved our objective, in that we have been able to describe our business as we wish it to be. We can also detect an interest on the part of employees in adopting these new working methods, but motivating them to do so remains a problem. We are often pressed for time, and when one job is completed, there are five more still to do. In these circumstances, managing a project in accordance with set guidelines takes low priority.

Nevertheless, by devising simple administrative solutions, we believe the system can be made to work. However, simplicity implies that the information is recorded in a very compressed form. We are therefore seeking to develop a sensible model for time recording and managing information regarding the work performed.

It has become apparent to us that it is sometimes necessary to call a halt to the rapid development of an IT company in order to reflect, document the company's operations and set new objectives.

Future plans

We are working on the assumption that the internal part of our improvement process will largely be completed by the end of 1998. It will then be time to extend the process as far as possible to our dealings with customers.

Examples of what this might involve include a standard format for e-mail messages to and from customers, set procedures for distributing product versions, and standardised document layouts. Other possibilities are common templates for brochures and publicity material and efficient distribution of these via the internet.

The technology to facilitate all this already exists, and the time to implement it is approaching – once we have rationalised our working methods.

Improved administrative procedures

The restructuring of operations which has taken place has increased our need for more efficient administrative procedures and systems to provide quick feedback on performance. In our process of improvement, we are currently noticing deficiencies in procedures for time reporting, for example, and sales, market and project monitoring.

We therefore regard improved administrative procedures as the next major issue for our company to focus upon.

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