



Software Process Improvement Case Study



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Overview - Manser Ltd is a wholly Irish owned company and the leading supplier in Ireland of a fully integrated accounting/ERP software system to small, medium sized enterprises.

The growth of the company has resulted in the need to review our software process. Also there was a requirement to ensure that sound software process procedures were in place for the re-engineering and implementation of our software using new technologies. The SPIRE project was identified as a suitable vehicle to pursue our aim and in turn derive real business benefits.

The project for software improvement aimed to identify a best practice software process methodology, adopt it, and adapt it for use in Manser Ltd. The result has been the development of a software process within the context of a recognised software quality system.

This has given Manser Ltd a sound foundation which is delivering real results but which has only just begun in the task of providing an optimum software process method for our business.



The Organisation and its Environment

Manser Ltd markets exclusively to the manufacturing industry, where it has built up a wealth of experience. The main product 'Manser Manager' has evolved since 1982, to become a solution for a vibrant Irish manufacturing industry. Along with the standard system many additional modules have been built over time to cater for system needs in specific manufacturing sectors.

The company presently directly employs 10 people, 5 in software development and 5 in support, training and consultancy. It extensively uses the strategic services of a sister computer company Datapac Ltd for marketing, and computer services beyond the software we provide and support. This partnership allows Manser Ltd to bid for larger contracts, with the knowledge that the capability for a complete range of services can be provided.

The expansion of the company dictated the need to develop, and implement, "a best practice software development process". Such a process was described by Frank Corr Software Services Manager and project leader;

"A workable system that would enable us to have better control over the quality of the software produced, both for design issues and defects."

The priority was to ensure that the original design of the software was adequately reviewed. This would minimize the risk of poor software development in meeting customer

requirements. It was also important that the software testing provided full coverage, with documentation and a consistent approach, to ensure a quality standard for software.

Deirdre O'Rourke, software support consultant commented that;

"Customer confidence will be enhanced with the prompt delivery of a correct and reliable product".

There are always development projects - standard product enhancements or bespoke software. It is critical that the development schedule is accurate for both the estimation of costs and the timing of the deliverables. This ensures that there is the maximum return on the development resources used. A reduction in the risks where development has not been properly documented and specified is a further benefit, allowing for cleaner development and less rework..

Development Manager, Dave Treanor says that:

" Development projects, especially the larger ones, need to be approached in a proper procedural manner to reduce the risks from going over the time schedule allowed and/ or budgeted cost."

In order to maintain our market position, Manser Ltd recognises the need to embrace new technologies that have become established as leading edge solutions. Presently Manser are planning a migration to a new development platform. According to Russell Lalor, Senior Software Engineer

" This migration is an opportunity to bring the best of the Manser Manager product software forward on to a leading edge development platform"



It is essential that this project is readily achievable through the procedures of a good software development process, but also that the on-going development on the new platform takes place in the context of the most desirable software development process. This would serve to maximize the business benefits from this major project.

Starting Point

Manser Ltd set up a project team to gather information on ‘best practice methodologies, suitable to a small software development enterprise where there was few formal procedures in place’. The response and commitment of all staff up to senior management was very favourable with the MD chairing the SPI meetings.

These weekly SPI meetings were used to involve people in supporting and contributing to the process as well as dissemination of information.

It became apparent at an early stage that there was a difficulty in identifying an established software process methodology which could be modified into a first step software process for our business and be implemented to show benefits within the project time scale. It was at this point, through our weekly workshops, that we decided to formulate the necessary procedures for *our* software process.

Frank Corr says;

This project is a first step in a long journey for software process improvement-It is important that the commitment by the personnel to the improvement of the software process shows tangible benefits.

The baseline study identified the areas of focus for the improvement project plan. There were two key goals;

- Introduce software processes prior to moving to a new development platform. To remain competitive it had been decided to re-engineer to a new technology platform. However this migration would not be appropriate until the software development was more defined and controlled.
- Identify and introduce best practice software process. Manser Ltd have very experienced staff and this has created a dependency on individual’s knowledge instead of a well defined process. The company would like to address this by identifying, and applying, best software processes. In particular the company is interested in the use of rapid application development within the new technology environment.

Based on the key business goals and the above assessment the following processes were recommended. These processes were selected on the basis of priority and on the understanding that the improvement project should take account of time and resource constraints

- Process definition - develop defined, controlled processes based on best practice.
- Quality Assurance - develop systems and procedures for the assurance of product and process quality

Dave Treanor says;

“Our primary goal is to progress from relying on job knowledge, to having clearly defined procedures.”

The Improvement Project

A project manager was appointed to champion the project and also to ensure that the project was managed effectively within schedule and budget. To fulfil these tasks, it was decided to hold weekly meetings to monitor the project progress and determine if there were any deviations from schedule or budget, with appropriate corrective action being taken when required.

The project was broken down into a number of steps;

- Identify and evaluate best practice software development processes
- Select best practice process method and modify to satisfy the company requirements
- Staff training on the new methods and drawing up an implementation plan
- Implement the project plan on a pilot project, review and evaluate the results
- Review the new process to ensure the focus is on quality assurance, and it is designed into procedures

The first step was to identify sources of information on best practise software development. These included CSE, TRI-SPIN case studies, published literature, ESSI projects and industry associations.

The information gathered allowed us to evaluate and short-list a number of methodologies compatible with the company.

In determining a best fit, we took account of the company’s size and culture, along with its business and technological strategies. The information on our short listed methodologies was communicated in a presentation to all staff.

We assessed the methodologies selected and determined what was best suited to the requirements.

All staff had an input to the design of the process, but when completed, training was undertaken to ensure that everyone involved understood the impact of this software process. There was a review to verify that there had been no undue divergence from the best practise software methodologies evaluated.

An implementation plan was devised to put the new processes in place. This applied to all projects commenced from a specified point in time, and it involved on-going training for staff to ensure the successful implementation of the new processes.

After a period of time following implementation, we reviewed the results (commercial, technical, and human) to determine if the criteria and targets specified had been achieved.

An internal quality audit was undertaken which identified weaknesses. From this, and also from a staff survey, a view was formulated on changes that were required on the process. These changes were implemented on the process which would ensure that their continued use could be sustained.

Geraldine Walsh, internal auditor commented that:

“ The breakdown of control systems, with the aid of SQM and ISO9001, helps increase the visibility of intermediate steps in the process. This in turn increases our own awareness of the many steps involved in a final product, and also with its application brings end user satisfaction to a higher level.”

It was recognised early on in our evaluation that quality assurance was an integral element of any best practice method. It was therefore decided that it would have to fulfil a quality system requirements such as ISO9001. It was with this in mind that all staff were made aware of the requirements of ISO9001 and it was employed in the design of the software process. Also a quality manager was appointed and training was provided for internal quality audits. The importance of configuration management was emphasised, not only for the software but also for all procedures and documents used in the process. The need for full regression testing of all software prior to shipment was designed into the procedures as well as dealing with product non-conformance.

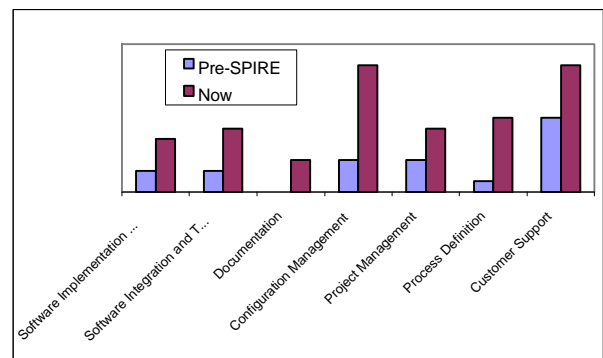
The aim was to build a very strong quality ‘get it right first time’ attitude among the staff.

Dave Treanor says:

“ It was important to define processes that were practical to understand, implement and not unwieldy”.

The Results

There was considerable achievement in the time scale. A software development process was designed and implemented. There was a significant amount of knowledge gained on software processes as well as the benefits of a quality system operating in the software development cycle. There were improvements within the organisation on all aspects of the software development cycle as was evident on a comparison of our bootcheck assessment before and after the project (see diagram below.)



The main problem encountered was initially after the evaluation of the best practise software methodologies. It was realised that there were few methodologies suitable for a small software development company.. This involved a re-think, where we decided to start designing a process within a defined section of the software development cycle. This design led to procedures, which were conforming to ISO9001 requirements.

While the results from the boot check assessment are encouraging, they are only starting to flow and at this stage would be difficult to measure. However, through our new procedures, which include collection of actual time spent on various software process activities, it has been found that there has been a 15% drop in time spent on rework of projects. This translates directly into more resources being available for core development.

Lessons Learned

The main outcome of the project has been the huge increase in awareness among staff of the need for a quality software process. This means that as changes take place in the company, such as new customer requirements, different software platforms, new staff members, the software process will provide a structure which makes it manageable. Even without such variables, there are always changes for the better which can be brought to bear on an existing process gained from the experience of using it in practice. The adoption of an ‘Off the shelf’ software development process is not really available or feasible. In



order for a process to work in a small company, it has to be very much owned by the staff, and based on their experience of what is practical to achieve results within the resources available. It is with these conditions that you achieve a starting process to which everyone subscribes and which has a momentum to continue in the future.

Plans for the Future

This is an intermediate milestone not the end of the project. The results achieved to date have demonstrated the benefits of process development and will ensure that both commitment and resources are available for ongoing process development. Also migrating to the new development platform can now be achieved with more confidence that it will generate the benefits expected. Although the process adopted to date has not had the opportunity to be involved with projects on the proposed new platform, there is a great level of confidence that this existing process provides a solid foundation to evolve, and cater for the new rapid application development environment. Since we have developed our existing procedures to be compliant with ISO9001, we have now joined a further project through CSE where along with a number of similar organisations we will be continuing to develop our procedures and quality management system to achieve ISO9001 accreditation within 12-18 months. It is acknowledged that within such a universally recognised quality management system we will be able to have software process procedures which will be used and maintained to give greater satisfaction to both staff and customers of a delivering a world class product and service. This in turn will impact on the profitability of the company as follows;

- Adherence to delivery schedules will ensure improved profitability on each software development project and more accurate costing of bespoke projects.
- Increased satisfaction of existing customer base will translate into more repeat and new business.

Frank Corr concludes that;

“Process improvement is not easy, or without cost, but it does bring tangible benefits which will ultimately increase your business profitability.”

Edel Creely Sales & Marketing Manager

“This project has enhanced the value of the outputs from our software development team in many ways, even in such a short time frame. It has improved our confidence in the future, to successfully deliver on the goals of our new development platform project in a cost effective manner into an increasingly competitive market“

David Laird Managing Director

“This project has brought immense benefits to Manser. The design and implementation of a software development process, in conjunction with the introduction of a quality system to the development cycle has brought more focussed development and more scope to continually develop software that not only meets but exceeds our customers changing requirements.”

“In the long term, it will contribute enormously to the company - both strategic and financial terms, by helping to maintain and grow our position in the market no matter how challenging the market becomes”.

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