Software Process Improvement Case Study

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FACILITIES MANAGEMENT WORKSHOP

setanta

Overview *- **Facility Management Workshop** FMW is a network management services company operating world-wide. From its base in Ireland the company provides a range of geographic information system (GIS) based applications and services for the successful implementation and improved management of telecommunication and cable TV networks.*

Having grown from a small individual company to an entrepreneurial business, we had no formal process or practices in place except Operating processes, so although we would have liked to have implemented a full lifecycle project we decided to put in place a Quality Management and Quality Assurance system within the development process which would enable us to:

- *Manage the risk both technically and financially at the pre-sales stage*
- *Design development controls*
- *Improve/help provide trace-ability and product quality*
- *Have a formal process for product/skills transfer to support the business*

The project has developed, documented and implemented a quality management and quality assurance system to define software development life cycle quality assurance requirements, measurement of performance and review of deviation.

The Organisation and its Environment

FMW is engaged in the design, development, delivery and support of network management applications to telecommunications operators throughout the world. The company is now undergoing a major transition from delivery of customised applications, to delivery of Telecom application products for mobile and fixed wire operators. We have developed and registered a new product called **Setanta,** which comprises a range of modules for planning; design and customer care activities associated with the development and management of mobile telephone networks.

Currently we employ 20 people and are on target for substantial growth over the next three years, building a strong team of consultants, analysts and developers to meet the challenges of the telecommunications market sector.

FMW has developed systems for a number of aspects of the Software development lifecycle including coding standards, software development process guidelines and build guidelines. In order for FMW to manage the growth required to increase and sustain market share and maintain existing customer base it was critical that FMW quality procedures are effective, clearly defined and documented to ensure quality of software engineering activities and product quality. FMW believe that focusing on this area will provide an excellent foundation for moving to ISO certification in the current year.
Having a company standard for the software engineering lifecycle will allow FMW to mobilise more effectively on projects and will reduce management overhead. It is anticipated that the application of standard metrics will also reduce the level of rework that can be associated with inconsistent application of planning and tracking activities.

The objective of the improvement project was to complete a definition of company standards to ensure work product quality and to define metrics for management of the Quality process. The Quality plan was applied to one small project during the time frame allocated for the Spire project to evaluate process effectiveness.

In the past both quality elements provided projects with a major opportunity to run into difficulty as process controls were not adequately defined and monitored.

Overall the anticipated benefits of Risk management visibility, development Control and responsive support will provide cost benefits of at least 10% from all future projects completed by FMW utilising the new methodology.

The project also provided additional unexpected benefits in the following areas:

- Standard document control process forming basis for addressing other business processes where the P.A. indicator is low for FMW
- Improved control of time to market for product releases due to consistent systems standards
- Improved customer satisfaction as a result of systems development standards and implementation controls
- Improved customer satisfaction through consistent quality awareness by all departments at FMW
- Faster mobilisation on projects ('everyone singing from the same hymn sheet')

Rodd Bond, *MD says, "As a company we want a quality culture that will form the basis for all aspects of FMW activities."*

Starting Point

FMW began by using the BootCheck self-Assessment application, which highlighted Quality Assurance and Quality Management as being the main areas for improvement. Most of the items under these areas were only partially done within the organisation, we needed to get these processes up to fully completed or largely completed. To compete in a highly competitive market FMW had to increase the profile capability level of the process from 1.1 to 2.2. This was our main project objective.

The following goals were then set to achieve project completion within a tight timeframe:

- Review existing QA/QM process to identify the level of compliance
- Identify process deficiencies
- Develop action plans
- Provide quality awareness training to all staff
- Develop systems where they do not currently exist or where operations deficiencies are identified
- Document operations to recognised industry standards
- Cultivate a quality ethos
- Evaluate phases effectiveness on a small project

*A **Quality Improvement Team (QIT)** was identified and contained one person from each of the following departments:*

- Sales
- Development
- Installation/Support

This selection would ensure that all planning, input, communication and implementation would involve all departments.

The Improvement Project

The overall approach

To succeed in this project we needed to address the following in both areas of QA & QM:

- Plan and track performance
- Plan and manage work product quality
- Apply company standard process definitions
- Have a formal process for product/skills transfer to support the business
- Design and implement control points at all stages of the lifecycle

In each area we needed to largely/ fully accomplish the following:

QA
- Quality criteria selected
- Quality records defined
- Quality of software engineering activities assured
- Quality of work products assured
- Results reported
- Deviations handled

QM
- Quality goals established
- Quality metrics defined
- Quality activities identified and performed
- Provide trace-ability on product quality
- Improve quality

Planned steps

We decided first to find out what everyone in the organisation thought our development lifecycle was and who was responsible. This action enabled us to formulate an agenda for quality awareness training, and to discuss the lifecycle currently in place. At this point we correlated everyone's input via their QIT representative to obtain buy-in to the project. This action allowed each member of staff to feel they had some form of ownership of developed processes and provide FMW with commitment.

Organisation of the project

Several items needed to be addressed at an early stage, and these were highlighted during the Gap Analysis:

- Tracking of the time spent on the Spire project. The timesheet database was amended
- Prepare communication and resource plans
- Setting up of a Quality directory on computer system which would include the four quality elements - Policy, Manual, Procedures and Forms. This directory would hold all documents relating to the Quality system.
- Prepare a quality assurance flowchart which would be the main catalyst for discussion when meeting with the QIT

Tools and methodologies used

In completing the project the following tools where used:

- MS Project for the communications and resource plans
- MS Access for the timesheet database
- MS Word and Excel for all other related documents in this project
- MS PowerPoint for presentation material

The impact to cultural and human factors issues

Overall staff were very positive and aware of the benefits to the organisation of this project. They felt the project could greatly improve the quality of the FMW software released. However they were less positive regarding the support or allocation of resource available to identify and implement SPI in FMW.

The Results

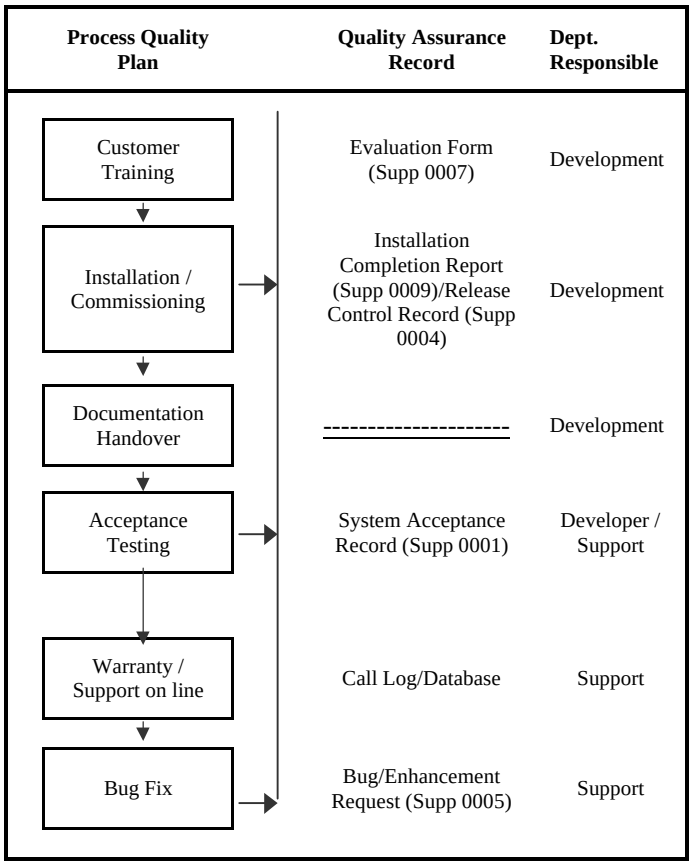
A Quality Management system is in place consisting of a Process Quality Plan with 3 main phases:

- Sales - Providing us with a Quality Assurance of risk management and Quality Control of user requirements
- Total Quality assurance of the Design, Development, Testing and Release stages, with assurance monitors of process Quality
- Close control of customer elements of Installation, Acceptance and Support, this process ensures product service deficiencies are recorded, reviewed and rectified

The process plan has 24 formal steps and some steps have sub-stages covering customer query to support bug fix.

The plan contains major control points at Sales, Development and Support, which are project stoppers. However we have other Quality assurance records throughout the lifecycle model.

Below is an example of the Installation and support process, defined under the Quality Management System:



Overall Benefits

- The SPI quality plan was implemented on a small project, which has been evaluated and results in cost saving of around 10%, were estimated.
- A final BootCheck assessment of our capabilities in Quality management and Quality Assurance indicate we have moved from a score of 1.6 to 5.4. This is a sizeable improvement for FMW on our initial assessment and is viewed very positively in-house. As a direct result of addressing these two specific processes we also made sizeable improvements in other areas such as Customer Support, Risk management and Project management.
- FMW standard which provide greatest effectiveness and efficiency – Operating process providing the cost benefits outlined above

Lessons Learned

Because we decided to address Quality Management and Quality Assurance, this also forced us to address project management and risk management forcing large improvements in both these areas.

Changing staff attitude in real terms is a slow process and takes longer than the time allocated to the SPIRE project.

Staff will gladly embrace change management provided they are aware of the benefits and the needs and are involved in implementation of the solution.

The availability of mentors with the relevant experience can assist the speed of the successful progress of SPI projects and reduce the timeframe by up to 50%.

The development of a quality management system with quality assurance checks completed throughout all stages of the projects life require very little extra overhead provided the checks are aligned to operating requirements and have a common sense foundation.

If you wish to guarantee success in implementing change, involve staff effected by the change and provide the commitment and leadership to enable the change to happen.

When one considers the commercial pressure on FMW to meet commitments the short timeframe allocated to the SPIRE project further increased this pressure.

Current software industry staff movement trends apparent in Ireland places more pressure on organisations and makes it difficult to have process/project continuity. (Project Manager and some of the Quality Improvement team departed company during this projects short timeframe).

Plans for the Future

The Quality Assurance process is now implemented on all new projects and is considered FMW standard operating procedures. In addition project management control is essential.

We are continuing the quality process in all areas of the business and would hope to move to ISO certification by the end of ’98 or the beginning of ’99 at the latest.

FMW is developing a company ethos of continuous improvement using the positive start of the SPIRE SPI project which has provided the catalyst for the cultural change.

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Facility Management Workshop
Donovan House, Longwalk
Dundalk, Co. Louth, Ireland
Tel: +353 42-33560
Fax: +353 42-338993
Email: info@fmw.ie
Web page: http://www.fmw.ie

SPIRE:

more information is available on the web site
http://www.cse.dcu.ie/spire

SPIRE Partner contacts:

Centre for Software Engineering,
Tel:- +353-1-704 5750
Fax:- +353-1-704 5605

Etnoteam
Tel :- +39 2 261 621
Fax :- +39 2 261 107 55

IVF
Tel :- +46 31 706 60 00
Fax :- +46 31 27 61 30

Austrian Research Centers - Seibersdorf
Tel :- +43 2254 780
Fax :- +43 2254 72133

Software Industry Federation,
Tel :- +44 1232 333939
Fax :- +44 1232 333454