The implementation and maintenance of a quality management system

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ABSTRACT

When ACT Financial Systems Ltd began to implement a Quality Management System over four years ago, it was with the intention of providing a system to support the growth which the company had experienced and provide a platform to sustain that growth.

Since then the company has gone through many changes and as part of the ACT Group, is actively engaged in growth through acquisition. The policy of ACT Financial Systems is to implement the QMS across the whole of the company and there have been major extensions to the QMS both in terms of scope and geographical coverage as the company has grown.

The paper will trace the history of the implementation of our QMS and show how the QMS is designed to provide standardisation, where relevant, whilst allowing for different methods of development to continue on our wide variety of products.

The paper will conclude by emphasising that certification of the QMS is not the end of the process, it must continue to be maintained to reflect enhanced working practices caused by new technology and changes in market requirements. Thus showing that an effectively implemented QMS and it's subsequent maintenance will allow an expanding company to meet the requirements of it's existing users and still maintain the flexibility to respond to changing markets and technology.
INTRODUCTION

ACT Financial Systems Ltd began to implement a Quality Management System at the end of 1990. Although unaware of the requirements of ISO9001, we implemented procedures to ensure that the growth that had been experienced in the sales and development of QUASAR, our investment management system, could be maintained. Our Quality Management System has subsequently grown and we have gained certification to both ISO9001 and TickIT. The system has, however, always been developed primarily to support and enhance the activities of the company with certification very much a secondary consideration. This paper details how we have implemented and maintained a Quality Management System across a number of offices.

IMPLEMENTING A QUALITY MANAGEMENT SYSTEM

The implementation of a Quality Management System is a significant undertaking. It must, therefore, be carefully project managed to ensure that it is implemented smoothly and that agreed timescales are met.

Simply stated a typical implementation at any company would follow these stages:

i) Define the reason for introducing a Quality Management System. If the Quality Management System is to be assessed for certification, even if it is not the primary reason for implementation, understand the requirements of the appropriate standard.
ii) Define a suitable structure for the Quality Management System taking into account the structure, activities and processes of the company involved. Decide upon the correct levels of documentation to match the company infrastructure and give careful consideration to those areas where processes are to be documented as applying across the whole of the company.

iii) Identify the relevant people to write the documents which are to be included in the Quality Management System.

iv) Hold awareness meetings with staff to explain the purpose of implementing a Quality Management System.

v) Issue documents to relevant members of staff.

vi) Carry out audits to ensure that the Quality Management System is being implemented correctly and that the staff are working in the way described by the procedures.

vii) Assessment.

THE IMPLEMENTATION AT ACT FINANCIAL SYSTEMS

Detailed below is a brief outline of how each of the above stages was undertaken at ACT Financial Systems Ltd.

i) Reason For Implementing Quality Management System
During the late 1980's the rapid expansion achieved by QUASAR had resulted in a high number of new employees being recruited. In order to provide new starters with the correct level of guidance it became clear that more formal procedures were required. At the end of 1990 the procedures for the five major sections within our development life cycle were documented by the relevant function managers, namely Project Management, Analysis & Design Programming, Software Configuration Management, and Support.

These procedures were to become the backbone of our Quality Management System but when they were first completed they provided a means of gaining more control. They gave the direction required to the new starters and ensured that the benefits of standardisation were enjoyed. Obviously it was important that they did not stifle creative flair but with so much development being undertaken it was important to ensure that staff were not just "Doing their own thing."
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Once the procedures were written they were distributed to the relevant members of staff. Each procedure included a review form on which staff could make suggestions as to how processes may be improved by enhancing procedures. Suggestions made were reviewed by the relevant function managers and the suitability and impact was assessed.

By using this mechanism, we were able to ensure that development was being carried out in a controlled manner and that any improvements to the processes involved could be quickly communicated to all the relevant staff.

The benefits of introducing these initial procedures, greater guidance for new starters, standardisation where appropriate, and better control soon became apparent.

As a result of this success the decision was taken in April 1991 to implement a Quality Management System across the whole of the Company.

By April 1991 we had become aware of the requirements of ISO9001 and it was clear that although the procedures which we had already written were a solid foundation, there were many other areas of the company that would benefit from being included in the Quality Management System.

We gained our knowledge of ISO9001 through attending seminars and courses, including auditing. Others may prefer to call upon consultants to provide them with the necessary advice.

Shortly after we began work on the Quality Management System we discovered the benefits of TickIT. The TickIT Guide is written for the IT software industry by IT professionals who understand the requirements of software development, it therefore gives a lot of useful guidance. The guide incorporates ISO9000-3 which gives guidance on the application of ISO9001 to those who are involved with software. It is structured in a logical way and goes into far more detail than ISO9001 e.g. ISO9001 does not make any specific mention of configuration management as this subject is scattered around a number of clauses. ISO9000-3, however, has 5 paragraphs on the subject and mentions 14 points for consideration. Configuration management is a vital area for us and the extra guidance provided by TickIT proved invaluable.
ii) Define a suitable structure for the Quality Management System

ACT Financial Systems has 5 offices in the UK and 10 others worldwide.

As a leading software house we provide:

- Design, development, implementation and support of financial software solutions
- Facilities Management
- Disaster Recovery Services
- Printing and Finishing
- Quality Management Consultancy
- Resourcing
- A range of other Support Services

These services are provided through the different offices. Each of the offices is comprised of Business Units. They are semi autonomous units which carry out defined activities. They are required to produce plans showing their profit levels and are then responsible for achieving these targets. There are over 30 Business Units in ACT Financial Systems and a high degree of interaction is required between many of them.

In order to provide a Quality Management System that supports the needs of the units across the different offices, a structure was designed that provides standardisation where it is required, whilst allowing the individual units the flexibility to operate in the most efficient and productive manner.
The structure that was developed for us, looks like this:

![Diagram of QMS documentation structure at ACTFS]

Figure 1: Structure of QMS documentation at ACTFS

From the structure it can be seen that we have 5 levels of documentation. These are:

- **Quality Manual** - this details how we respond to the question of quality. It provides an overview of how the company manages and controls its processes. The manual must take into account company objectives whilst remaining flexible enough to allow for changes in market conditions.
Company Standards - local Procedures may only apply to a small section of staff but as the name suggests company standards must be followed by the entire company. It is important to decide in which areas there should or must be standardisation and document these procedures as company standards. We currently have six standards that have been identified as mandatory across the whole of the company. Two of them, the "TIM" procedure and contract review detail the activities at the start of any project i.e. deciding whether or not a project should be undertaken and the reviewing of contracts to make certain they can be fulfilled profitably. The other four deal with purchasing, document control, customer complaints and quality audit. All of these procedures are relevant to all the business units regardless of the product that they produce or the service they provide and have been documented as company standards to ensure consistency in these areas.

Business Unit Manuals - this describes the activities of the particular business unit. We have over 30 business units with a lot of interaction, so these manuals were introduced to help improve transactions and communications between the various units. They detail deliverables, handover points and dependencies on other business units.

Local Procedures - these are the more detailed work instructions. Although dealing with similar areas such as programming and configuration management the way in which these activities are performed will vary from business unit to business unit. This is because some are developing standard packages whilst others produce bespoke modifications or specific projects involving one client. The requirements for the different types of development will vary greatly. Programming standards and procedures will also vary according to the different languages, operating systems and hardware platforms being used. There is no benefit in trying to enforce one particular way of carrying out these activities. Therefore, where appropriate different local procedures are documented and implemented for the various business units.

Quality Plans - a separate quality plan is produced when every new project is started. The plan allows the project manager to state the standards and local procedures that will be followed. It also provides a method of measuring the risks involved with the project, determines the correct level of involvement from the client to ensure that their requirements are met and also gives a method of controlling the progress of a project against it's proposed plan.
iii) Identify who should document procedures and implement them

The implementation of the Quality Management System has been undertaken by our Product Support Department (the department name is intended to convey to our colleagues that the Quality Management System is there to support them and is not an end in itself). However we have involved the relevant directors and members of staff at all times in the writing of all types of documentation. This means that the system has been written by the staff who are responsible for performing the tasks which helps to ensure that the best practices are recorded.

As previously mentioned, review forms are provided to allow the staff who have to operate under the procedures to suggest changes where they feel there may be improvements.

Product Support have a local site representative at each of the offices within the U.K., who has a good understanding of the work that is carried out by the Business Units in that office. They are responsible for overseeing the Quality Management System at that office, for example by controlling the distribution of quality documents and carrying out quality audits. The knowledge of the activities in their area assists the local representatives when carrying out quality audits to ensure that the Quality Management System is effective and providing the correct level of support.

Regular meetings of the Product Support department enables us to understand the differences in procedures for similar activities in the various business units and offers us the opportunity to consider the suitability of adopting these across a number of units, or indeed the whole of the company in which case they would be made into company standards.

All of these measures help to produce a practical Quality Management System which supports the objectives of the company.

iv) Hold awareness meetings

It is important to involve those people who are actually performing the processes in the writing of documents. However, especially in a large organisation, not everyone can be involved in the composition of procedures and other manuals. It is, therefore imperative to hold awareness meetings with other members of staff so that they understand what is going on and are made to feel a part of the system. They will have to operate under it and it is vital to gain their understanding and co-operation.

They should be helped to see that the Quality Management System is there to support them and any views or concerns that they have should be welcomed and discussed.
It is likely that a Quality Management System will slow down certain processes and it is important to spend time with staff who are affected by these changes explaining the procedures and showing the benefits of the changes to both them and the Company as a whole.

v) Issue Documents
When the procedures are issued it is important to determine who needs to receive each of the procedures. There is little point in supplying everyone with all the procedures as this is likely to result in such a mass of documentation that no-one will bother reading anything.

Once again it is important to involve the relevant managers in deciding which procedures should be received by their staff as they will know the activities they perform and therefore which documents will be relevant.

It is important to keep control over the issue of documents in the Quality Management System and project work. By knowing who has received a copy of the different documents it is possible to ensure that they have the latest procedures to follow and project documentation to work from.

To make sure this happens the documents mentioned above become controlled copies. A list must then be maintained of the controlled copies of documents that have been issued. Rather than issue a separate control sheet with every single document we maintain the issue of our controlled documents on a single spreadsheet. This then allows us at a glance to ensure that everyone has the documentation they should do.

Procedures do not have to be issued in printed format. They can be issued over a network, provided the necessary steps are taken to guarantee configuration control.

vi) Perform audits
Having implemented even some of the Quality Management System it is important to make sure that it has been implemented correctly, procedures are being followed and that they are effective. Auditing plays a vital part in this.

It is essential that audits are carried out properly. Those who are being audited must not be made to feel that they are being interrogated, or it is an assessment of their personal ability. Instead they must be helped to understand that although it involves checking that procedures are being followed, the primary function of auditing is to ensure that the Quality Management System is helping the company to achieve its objectives.
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If audits are poorly executed they can prove not only totally ineffectual but also very unpopular. It is, therefore, imperative that auditing skills are learnt as early as possible in the development of the Quality Management System. I would definitely recommend attending one of the various courses that are held on auditing.

Auditing is one of the methods of maintaining and enhancing the Quality Management System. I will describe how we perform our audits later on.

Auditing techniques will improve with time and experience, which will lead to better and more productive auditing. However, the audit process must start as soon as any part of the Quality Management System is in place. This helps to ensure that it is being implemented correctly and it is effective. It also gets people used to the idea of being audited and helps to prepare them for the external assessment.

viii) Assessment

The assessment will be carried out to the appropriate standards. In our case these were ISO9001 and TickIT. If there is any doubt as to the standards that would be appropriate for your organisation these should be discussed with either a consultant or the assessment body that has been chosen.

Once the Quality Management System has begun to take shape, possible dates for assessment should also be discussed with the assessment body. It is important not to be assessed too early because even if the system is complete there will be little evidence to show the auditors that it is has been implemented correctly and meets the required standards.

Before the actual assessment of the Quality Management System the auditors will carry out a documentation pre-audit. This is to examine the documentation in the system, to help them gain an understanding of the system and make sure that all the major clauses have been addressed.

When the assessment is carried out, it will be performed over a previously specified number of days. The auditors will look for objective evidence that the documented procedures are being followed and that they cover the requirements of the standard against which the assessment is taking place.
At the end of the assessment, the auditors will decide whether the system has been implemented correctly and is worthy of certification. They will recommend one of the following:

- Immediate certification

- Certification dependent upon the successful clear down of certain non-conformities.

- That the system is not yet ready for certification and that further work has to be undertaken. In this case, depending on the amount of work that is left to be done, they will agree a date when they will re-assess the System.

ix) Costs & Benefits

We have implemented our Quality Management System in a number of the UK offices but the principles can equally be applied to implementation in one office. To give some indication of costs and benefits I will use the example of our office in Birmingham where QUASAR, our Investment Management System, is designed, developed, installed and supported.

To gain certification at Birmingham we had 2 people working full time on implementing the system. We began work on the full Quality Management System in April 1991. At that time we had not even looked at the clauses of ISO9001 let alone tried to interpret them! It took us a year to implement the system and gain certification at a cost of just over £100,000.

The cost, however, must be put in perspective, the figure is less than 1% of our annual turnover and has been repaid many times by the benefits we have enjoyed.

It is always a difficult task to exactly quantify the benefits of a Quality Management System since no-one knows what would have been achieved without it. Undoubtedly there are advantages to implementing a system and gaining certification. It is widely recognised by the marketplace and is a strong marketing tool. It is also a factor in every I.T.T. that we respond to.

However, an effective Quality Management System is much more than a marketing exercise. A well implemented system will offer the advantages of control, guidance and support and will turn these into increased productivity and profitability.
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In the two financial years since we began work on the Quality Management System ACTFS has achieved the following results from QUASAR the package developed and supported in Birmingham.

% Increase

- Turnover 49
- Profit 123
- Package Size 22

There can be no doubt that the Quality Management System has helped us to achieve these figures by ensuring that we meet our customer's needs both in terms of functionality and reliability.

The implementation of the Quality Management System has also seen a reduction in other costs. The workload of Software Release and Control in terms of releases and control over routines under development has increased by 20% since April 1991. The significant fact, however, is that now a documented release and control system is in place the work is carried out by 2 people compared to the 4 that were required in 1991.

MAINTENANCE

Just as a software product is continually enhanced to ensure that it provides the functionality required by users, so the Quality Management System must be reviewed and enhanced to ensure that it continues to offer the correct level of support in the most efficient manner.

There are two types of maintenance i) Administration - making sure that everyone has up to date procedures ii) Enhancements to the system - to either a) reflect changes in working practices because of new methodologies, improvements in technology etc or b) altering existing procedures to produce better quality software and services.

There are a number of ways in which the Quality Management System is reviewed to ensure that it is maintained correctly.

i) Auditing - Internal and external.

ii) Review forms/Re-issue procedures

iii) Management Reviews

iv) Customer Complaints
A brief description of each of these activities is given below:

i) Audits
Following certification, the assessment body will carry out surveillance audits every six months. They carry out interviews and examine the procedures for a sample of the company. These audits are performed, primarily to confirm that the Quality Management System still conforms to the requirements of the standard to which it is certified. However, any non-conformities that are raised and the comments made in the audit report will help to highlight any weak links in the system and can be used to improve it.

Certificates are only valid for three years and at the end of that time the whole system will be re-assessed by the auditors to ensure that it still conforms to the relevant standards.

As well as the external audits, it is imperative to perform regular internal audits. These audits will check that processes are being carried out as described in the procedures. However, they also play the far more important role of identifying any areas for potential improvement in the Quality Management System.

Before conducting an internal audit we ask the relevant Business Unit Manager to give us guidance in the areas that we should be auditing. By doing this we can concentrate on areas that the Business Unit Managers feel are giving them cause for concern. The audit will then show whether difficulties are being caused by staff not conforming to the procedures or if the procedures, themselves need to be enhanced.

Internal audits are carried out by members of Product Support and as with the external audit a report will be written when the audit is complete. It will detail any non-conformities that have been raised and will make recommendations for any areas of improvement.

A form is provided at the end of the report to allow the Business Unit Manager to provide feedback to Product Support on the effectiveness of the audit.
ii) Review Forms
As mentioned earlier, review forms are provided with all the procedures that are issued. Staff are asked to complete them for any suggested improvements they may have. The forms are returned to Product Support and then passed on to the relevant function manager for their consideration. If the amendments are incorporated into the Quality Management System the relevant members of staff will be informed of the change in working practices. The procedures will be changed accordingly and distributed with the next release.

New releases of procedures are circulated with a release memo which details the changes that are being made. It will highlight the changes to existing procedures and outline the purpose of new ones. Thus, by reading a short memo the person receiving the changes can quickly see the enhancements that have been made. Where applicable the memo will also identify any procedures that have become obsolete.

Where the suggestion can be used across the whole of the company the enhancement will be included into the appropriate company standard, or if necessary a new company standard written.

Where procedures have been issued over a network the enhancements and release memo can be sent in the same way.

iii) Management Review
This is a vital part of maintaining the Quality Management System. I have stressed a number of times that it is important that the Quality Management System supports the company's objectives. If this is to happen it is imperative that the management of the company provide feedback on it's effectiveness.

At the regular meeting of the Business Unit Managers to discuss past performance and plans for the future, a report on the activities of the Product Support department and the status of the Quality Management System is given. The managers are then invited to make any comments they may have on the report and suggest any areas for improvement.

iv) Complaints Procedure
Analysing customer complaints is another mechanism for maintaining the Quality Management System. Records are kept of complaints and the action taken to resolve them, these are then analysed to show which, if any, processes need to be improved to prevent such complaints from arising.
The maintenance of the Quality Management System is carried out by the Product Support department. Again, it has proved useful to have local representatives to provide guidelines for the maintenance of the Quality Management System at each office. They have a better understanding of the products and services provided by the Business Units in those offices. They can then use this knowledge to ensure that the system is supportive.

Although the maintenance work is carried out by Product Support staff, it is vitally important to include the relevant management and staff in the maintenance work. This will help to ensure that any changes to procedures are again documented by those who actually perform the processes. All levels of staff should then see that the Quality Management System has been implemented to support them.

CONCLUSION

The Quality Management System at ACT Financial Systems Ltd has been implemented to help the Company achieve its objectives by providing support to the Business Units. The Quality Management System has, undoubtedly, contributed to the growth in productivity and profitability and its conformance to international standards has been recognised by certification to ISO9001 and TickIT. For it to remain effective it must continue to grow with the company and reflect the changing requirements of the marketplace. The on-going maintenance of the system will, therefore, be every bit as important as the initial implementation.