

# SME Supplier Management: An Exercise in Change Management

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**Abstract.** The problems facing a manufacturing SME in the current UK economic climate are many and varied. This paper describes the experience of a Knowledge Transfer Project (KTP) Associate and her academic supervisor working for a customer-centric company in a dynamic manufacturing environment. With issues ranging from quality of the product itself, supplier relationships, a ‘no questions asked’ returns policy and a sometimes indifferent manufacturing workforce the paper sets out the problems encountered, the solutions offered and then implemented. Beyond the quick win solutions the real value of the project was a change in attitude which has allowed awkward questions to be asked, considered and not swept back under the carpet. Early indications are that the KTP project has been of major benefit to the company on a number of fronts.

## 1 Introduction

The company as Sunalex has been in existence for over 25 years manufacturing a variety of lighting equipment for domestic and industrial/medical applications. “When it comes to Reading Lights we know what we’re talking about. We’ve been designing and building lights that help people read and work in more comfort for over 20 years. Originally we built lights for businesses such as clothing manufacturers where employees were putting their eyes under considerable strain. We’ve even built lights used in tough conditions like on board Lifeboats and the Space Shuttle. Over the last 4 years we have adapted, modified and improved on this original lighting technology to create a range of reading lights for people to use in their own home.”

The focus of the KTP project has been on the ‘domestic’ side of the market in the ‘manufacture’ and distribution of standard and side lamps. The lights are aimed at the high end of the market in terms of the older generation who require a good light for reading.

“Our customers are discerning mature readers who take an active interest in the world.”

The company competes using a customer centric approach. This is an approach to doing business in which a company focuses on creating a positive consumer experience at the point of sale and post-sale.

‘A customer-centric approach can add value to a company by differentiating themselves from competitors who do not offer the same experience.’ (Business Dictionary 2009).

This is articulated in ‘The Deal’ offered to customers, which includes a 30 day risk-free trial:

“We are so confident that you will love our lights, that we offer a 30 day risk-free trial on them. This means that if you’re not totally happy with your light then we’ll refund the full amount, including any delivery charge and come and collect the light at no cost to you.”

In practice, 98% of customers decide to keep the light. A quality product aimed specifically at the older market that offers to reverse the years when it comes to reading experience: with the title “Why you need a Proper Reading Light”, the literature explains:

“Unfortunately, as our eyes get older they need more light to be able to see clearly and to read in more comfort. This is an unavoidable consequence of the natural ageing process of the human eye. At Sunalex, for many years we’ve been designing Reading Lights that enable you to read in a way that you took for granted when you were younger. You’ll be amazed at the difference a proper Reading Light can make! Of course our lights can also be used for any hobbies where you’re putting a strain on your eyes such as such as needlecraft, stamp collecting or jigsaw puzzles.”

‘The Deal’ eventually equates to the agreement that the customer can buy the light and return it for whatever reason – no questions, no cost (postage paid by the company); and then get a new light or their money back. This is a 5 year guarantee.

## 2 The Problems

The original aim of the KTP project was to:

- Research and then apply TQM or appropriate techniques toward the elimination of quality issues.
- Research new materials and methods for production, development and testing of new products.
- Develop and implement advanced production procedures and processes to maximize output of globally competitive specialist products.
- Address a company-wide environment policy need.
- Be a proactive member of the company’s management team.

As the project has progressed these aims have been modified slightly in the light of events and the current economic climate – but they are fundamentally still being met.

The initial job of the KTP associate was to:

- investigate the quality issues responsible for the returns and
- then reduce a the number of returns by addressing and correcting the quality issues.

After a simple Pareto Analysis of the returns of light units to the company theKTP associate produced a 'hit list' of areas where low-cost high-impact improvements around these issues could be made.

### 3 Returns

The 'Deal' allows a customer to return lights for whatever reason. A return would involve paying the return to company packing and postage, examination and repair of the unit and subsequent packaging and return to the customer. These 'returns' are logged and examined on a daily basis. The reason for this daily logging and analysis is obviously the cost of these returns – which at the high of a 3.5% return rate was significant.

It was this 'rate of return' which became the initial focus of the KTP project – although other issues such as light and component design, factory management, personnel attitude, factory and company culture all needed to be considered along the way.

All of the returns are categorized as quality issues and might include a blown bulb, customer not being able to operate the dimmer switch, 'doesn't work' etc. The elimination of quality issues has been the major feature of the work carried out within the company.

Many of the returns were concerned with incorrect orders being picked, packed and then sent to customers. The Pareto analysis showed that picking and dispatching could be an area which would produce some 'quick wins'. One of the most obvious problems was simply the factory layout with the areas concerned with assembly, picking of items, packaging and then dispatch being widely separated. The initial analysis was done using tools based on recent value-mapping ideas (PH Magnier. (2009).

The main aim of value-mapping is to:

".....depict material and information flows across and throughout all Value adding processes required to produce and ship the product to the customer. Value stream maps document all of the processes used to produce and ship the product, both value adding and non-value adding (waste) processes."

Mapping of the value stream was completed in the packing area and picking tracks were identified and combined. The area was expanded and better lit than before with the addition of laminated 'reminder signs' and indicator boards (which bulb or accessory was to go with which light). The whole packing process was improved by giving accurate picking lists combined with clear instructions of what and how to pack. This meant that staff were able to perform better and consequently the rate of returns (for packing faults) diminished rapidly.

### 4 Factory Layout

The project has now developed the value stream from a make-to-stock process to a make-to-order sequence which allows transparency of stock levels and a tighter control on cash flow.

Building on this success the Associate ordered new racking and storage for the manufacturing areas and instigated a general clean up and reorganization of the factory areas. These actions fell out of the Kaizen methodology of elimination of waste (muda) and the 5-S framework for good ‘housekeeping’:

1. Seiri - tidiness
2. Seiton - orderliness
3. Seiso - cleanliness
4. Seiketsu - standardized clean-up
5. Shitsuke – discipline - standardization.

This initiative coupled with the Hawthorne effect led to a marked improvement in returns and a less marked improvement in personnel attitude.

As with any organizational change there is a well known placebo effect – the Hawthorne Effect – from the studies of Elton Mayo at the Western Electric plant in the late 20’s and 30’s (Roethlisberger and Dickson, 1939). The Hawthorne effect was derived from a series of controlled studies which found that performance improved as the working environment improved. The strange thing about the Hawthorne effect, and less easily explained was that performance also improved as the working environment changed for the worse!

## 5 ‘Green’ Soldering

One of the problems thrown up in the initial analysis was that of use lead free solder. The company prides itself on being as eco-friendly as possible (although it had not gone for ISO14001) and ensured that it recycled packaging and manufacturing materials where it could. The company had duly followed the legislation regarding lead-free solder and were indeed using a ‘recommended’ lead-free solder.

Using is perhaps the wrong word, struggling might have been more accurate. The solder did not melt at the previous temperature and when it did it would not flow or adhere to the terminal contacts as the lead solder had done.

As part of the KTP project the Associate asked if the University could look into this. Professor David Jacobson from the Centre for Design and Manufacture was duly dispatched. He immediately diagnosed the problem that the company had been recommended a machine lead-free solder. After sourcing and ‘hand soldering’ and better flowing solder, changing the soldering iron tips and transformers the problem was solved to the delight of the manufacturing staff.

This improvement gave much to the reputation of the KTP associate. In establishing this credibility it gave rise to a slightly more welcoming attitude to future changes.

## 6 Personnel Attitude

There were a number of hurdles which needed to be overcome before the real work of the project could begin. Staff were reluctant to engage in any quality

control and would sometimes return faulty lights to good stock without testing them properly. There was little or no ‘listening’ culture within the firm and little sense of quality and particularly any sense of responsibility for quality.

The arrival of the KTP associate was seen as a threat. The status-quo was upset and new attitudes seen as ‘more work for the same pay’.

In order to address these issues the associate began a series of team meetings and a charm offensive in an effort to change attitudes. A healthy eating scheme was introduced (eat more fruit) and any ‘environmentally friendly’ or ‘healthy option’ was heavily encouraged. ‘Music therapy’ (or at least a vote on the best station to play during the day) was also introduced by the associate who purchased a radio to for the express purpose of calming the workforce. It seems to have worked.

Unfortunately the charm offensive coincided with the economic downturn and a number of redundancies and an across-the-board pay cut were forced upon the company. Despite this the general attitude and atmosphere within the company has improved markedly.

## 7 Suppliers

The next highlight on the Pareto list was the issue of supplier relationships. A number of recurrent faults and design issues had been identified and despite numerous calls, faxes, e-mails etc little had been resolved.

‘The first thing that purchasing people can focus on is reducing the supplier base. The more suppliers a company has, the more variation in incoming material and services they will experience, leading to a host of potential problems including poorer quality of the final product. Quicker wear of moving parts, and increased times for handling and assembly times. Companies with a large supplier base miss out on the continual improvements in quality cost and cycle times that a close relationship with a supplier can bring’ (Stocker 2006)

It was decided that the Associate, along with the financial controller would attend the annual lighting expo in China – while at the same time visiting the suppliers on ‘home territory’. This was the first real supply chain management which had been carried out by the company and was guided by the standard approach to the discipline which is:

- The oversight and management of materials and services inputs
- The production process in which those materials and services are used, and
- The provision of outputs that are generated through the use of the acquired materials and services, which is analogous to the fulfilment of customer requirements.

The main cause for concern centred around the transformer and the need for additional driver (for the new LED light) and the difficulties with overheating of some of the supplied units. The vendor meeting and subsequent e-mails resulted in improved moulding design to reduce overheating, a number of design tweaks toward an improved product and, perhaps most spectacular of all, a price per part reduction from \$10 to \$6.20.

The trip to China was very successful and is to be repeated October 2009. The purpose of the trip will be to:

1. attend the China Lighting Expo and
2. to locate and source a (possible) new supplier.

Many of the problems with the manufacture and subsequent operation of the lights stemmed from the basic design. The cause of these faults and then returns was really the age old problem of the 'over-the-wall' attitude toward design and manufacturing.

'Because a particular design is eventually made into a product design and manufacturing must be intimately interrelated' (Serope Kalpakjian, 1992).

The components and assembly design of the lamp were 'taken for granted' and 'got on with'. This meant that there were a myriad of problems in areas of:

- (a) wiring connections
- (b) direction of assembly and
- (c) alignment problems.

In an effort to highlight these problems and give a fresh approach to their alleviation it was decided to allow a group of Product Design students from the University to tour the factory and then to carry out a 'design crit'. The students were studying the module 'Design for Manufacture' and provided some valuable insights.

'Each part or component of a product must be designed so that it not only meets design requirements and specifications, but also can be manufactured economically and with relative ease. This approach improves productivity and allows a manufacturer to remain competitive..... This approach is now recognized as the area of "Design for Manufacture"' Serope Kalpakjian (1992).

One of the areas in which improvements were made immediately was the area of wiring within the base of the light which involved the use of a difficult to use joining terminal. This was a recognized problem and various solutions had already been proposed – even by the KTP supervisor. The Product design students saw the problem in a different light and proposed their own solution – to do away with the terminal block and simply solder the wires together. An obvious if inelegant solution but with the addition of insulation sleeving it seemed to offer a solution. This method was tried, tested and evaluated on a batch of units and then adopted as the new wiring joining method. This method had eliminated the need for a wiring terminal and increased the speed of operation for assembly of the light. In addition to these quick wins the students presented the senior management team with a critique of the current design and suggestions for future designs. While not all of these suggestions were wholly practical some good ideas were generated and noted for future work.

## 8 Burn Tests

All lights were previously tested (on/off) before being packed and sent to the customer. Despite this lights were returned as 'not working' due to blown bulbs or

blown transformers. It was then decided to conduct burn tests on each light (2 hours) to ensure that at least some of these faults were revealed.

The burn tests immediately showed up a number of faults and it was decided that all lights would be tested prior to final packing.

## 9 Aesthetic Considerations

A number of returns around 'aesthetics' of the product were due to mis-alignment of the wooden handle with the flexible stem. A relatively expensive light with faults of this nature did not send the message of quality which the company were trying to project. The Associate started a dialogue with the suppliers and this resulted in a change of design – which went some way to alleviating the problem. It is interesting to note that this particular problem was one which the Associate had to champion. The 'fault' did not show up on the returns and it was only with this 'detached' or 'fresh' perspective was the problem even noticed.

## 10 Successes

A number of 'solutions' to the various problems were proposed, evaluated and then either rejected or implemented. The TQM solutions employed to address the problems of the company were chosen and applied not as part of a general Total Quality management implementation but more as a series of interventions designed to solve particular problems.

The structure, economic position and 'will' within the company did not allow a general TQM solution and so the specific tools and techniques used were used in isolation. Despite this apparent drawback and less than 'textbook' approach the tools and techniques coupled with the drive and ambition of the KTP associate proved that these tools were effective and worthwhile.

For example the major achievements in terms of value mapping were translated into 'layman's' terms as 'changing the factory layout'. Simple but effective it was one of the major 'initial wins' of the project.

With reference to the original aims of the KTP project we can record a definite success on all of the original aims – to an extent.

*Research and then apply TQM or appropriate techniques toward the elimination of quality issues.* – A definite **success** in terms of the application of appropriate change strategies and the overall reduction of failures and returns across the range of products.

*Research new materials and methods for production, development and testing of new products.* – Mainly achieved through the initial change strategies and then through supplier relationships and communications there have been definite successes in this area.

Develop and implement advanced production procedures and processes to maximize output of globally competitive specialist products. The field has been cleared to enable work to be started on this aspect of the project.

*Address a company-wide environment policy need* .- Partially addressed and successes in some areas of recycling and reuse.

*Be a proactive member of the company's management team.*- A definite **success** as the Associate has become an invaluable and essential member of the management team.

The success achieved in meeting the original objectives do not really reveal the true nature of the overall success. At a meeting to review the project the Sales Director commented:

“(the Associate) has been brave enough to ask awkward questions of the company – questions that had not been answered or even whispered before. We were so busy fighting fires and congratulating ourselves that we could fight fires that we were afraid to ask any questions. We are only now developing this ‘questioning culture’ and the answers have proved to be more than we had hoped for.”

## 11 Conclusions

The project has been success in that the company has been transformed over the two years from a fire-fighting, hand-to-mouth existence into a structured, proactive, quality conscious operation. The application of various TQM techniques has resulted in immediate improvements and a structured, sustainable approach to quality issues which have beset the company.

Perhaps the most important and significant change within the company has been the cultural and attitude change brought about by the work and example of the KTP Associate. From a position of rejecting any change because it was seen as a threat the culture has changed to accepting change (perhaps not exactly embracing).

The idea of change has now been embedded in the company and is no longer seen as reactive but is now perceived as pro-active.

The economic downturn and changes within the company have been additional hurdles and problems to be overcome. This has obviously affected the project in some ways but in the final analysis it has had little detrimental affect.

Overall the KTP project has been a success. Whilst not achieving all the original aims it has achieved targets which were not even in the original scope of the project – but all in a truly dynamic and real world scenario.

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