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ARTICLE

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The Designer Organisation

Organisations too can benefit from the application of design and quality tools, and with startling results!

Abstract: *This paper outlines the design of a completely new global business-critical organisation. The design process utilised and reconciled the diverse range of experience and opinions of the people who are to work within the new organisation in order to establish full and active commitment to its success. Quality Function Deployment (QFD) was used to drive a series of group discussions, ensuring full participation in objectively determining the organisation's objectives, processes, strategies and priorities. The tools were adapted to ensure the continued interest and engagement of busy, pragmatic, senior executives who were subject to the typical day-to-day pressures of running a high-profile business. The steps that were taken to achieve this are explained and supported with practical illustrations. The commitment, objectivity and creativity generated through QFD led to doubling and tripling of performance and cost savings of $3 million per annum.*

QFD provides an extremely powerful and effective tool for the planning and management of both new and established enterprises.

It is axiomatic that the rate of change in our world is ever increasing - new technology is continuously being introduced, political situations change almost daily, and the flow of information regarding both is now instantaneous and overwhelming (Dixon, 1998). And each new change brings with it new challenges and new opportunities; opportunities that can generate significant profits for organisations that are well positioned to take full advantage of them, and challenges that can sound the death knell of those that are not.

But this rate of change has led to a dilemma in how organisations should best respond to the change (Slywotzky and Morrison, 1998). Should they try to adapt to it, or should they face it anew? In some areas of business, the rate of change is now so great that it outstrips the ability of organisations to accommodate it organically. No sooner has one change begun to be assimilated in altered attitudes and working practices, than it is superceded by other changes. People become confused, and the organisation begins to lose coherence and direction. The alternative, to develop a new organisation from scratch, overcomes this problem by dispensing with history, but in doing so provides little basis for carrying over tacit and intrinsic organisational 'expertise', and the new organisation runs the risk of having to relearn past lessons, some of which may prove crucial to its survival. The answer is not straightforward, but one thing is clear - as the rate of change continues to increase, the successful organisations will be those that are faster at accommodating change, and better at robustly redesigning themselves.

One organisation that has learnt to do both of these things well is the Process Systems and Solutions business of Emerson Process Management, and at the heart of their strategy for

both is one core tool. The tool is called Quality Function Deployment (QFD), a tool more traditionally associated with designers and quality engineers; a tool which enables them to rigorously deploy their objectives into the fabric of the products they develop and build. But QFD is very versatile, and what it achieves for products, it can also achieve for entire organisations. QFD is now core to how Emerson:

- Establish clear objectives in response to change
- Determine winning performance targets
- Optimise and organise their resources
- Focus their potential on priority strategies
- Harness the commitment and ideas of the whole organisation
- Ensure success through effective communication

The purpose of this paper is to illustrate how QFD achieves this. It is based on one practical example drawn from Emerson and how it used QFD to develop a new supply chain organisation.

Background

Emerson Process Management is a well-known electronics multinational with a reputation for innovative high-quality products and solutions for the process control industry. The products of Emerson's systems business are primarily based around integrated circuits and software residing on complex circuit boards, and housed in small boxes and large cabinets.

Over recent years the whole economics of electronics manufacture has been changing. Low-cost electronics manufacturers in the Far-East are proving increasingly capable and reliable. And their low labour cost base more than compensates for the cost of transportation and logistics (Kirby, 2003). Consequently, more and more electronics manufacture is migrating there and, as a result, electronics manufacturing has become a commodity service with very low profit margins.

Emerson recognised that their technical supremacy in concept and design risked being compromised by their traditional approach to supply. Cost advantages and profit margins generated through new innovations were quickly eroded by their competitor's lower production costs. Early attempts by Emerson to simply outsource their manufacturing activities in order to reduce their own cost base had compromised both quality and delivery performance. Emerson concluded that they needed to totally rethink their approach to manufacture and supply, starting with a clean sheet of paper.

The World-Wide Supply Chain (WWSC) project was what resulted; it is a Global supply chain with world-wide responsibility for realising the company's innovative designs through a international network of dedicated suppliers, and for delivering high quality product to its customers on very short lead-times.

The parent organisation's reputation and the large sales value for this business was to rest on WWSC's ability to identify, develop and influence independent businesses to sustain exacting quality requirements and very short cycle-times at ever decreasing costs. The creation of WWSC represented a massive transformation for the business and its ways of working, with high rewards for success, but terminal consequences for failure, so the organisation used its best people for the task, and head-hunted a number of experts from external companies. The challenge then became one of forming them into an effective team with the means to harness their individual talents and experience in ensuring a successful result.

The MD of the new supply chain organisation recognised the power of QFD to harness a diverse group of people and talents in delivering an ambitious set of goals. Given the new and unproven nature of the organisation, he believed that QFD provided the best means for people to work through how the organisation needed to operate and to harness existing organisational learning in addressing the new challenges and opportunities. The objective for the work was to use QFD to:

- Clarify the dimensions of success in terms of clear objectives and performance targets for WWSC
- Identify the key supply-chain processes, and define their responsibility for delivering the objectives

- Explore the interdependence between the processes and establish how they needed to work together
- Clarify how the processes would fulfil their responsibilities, and build commitment to that

QFD is a very powerful design tool. It is essentially a systematic planning matrix, which clarifies success in terms of measured performance objectives (Quality = achievement of targets) assigns responsibility for different aspects of that success to processes (Function = ways of working) that are effectively actioned by teams (Deployment = inspiring commitment in others). In simple terms QFD helps organisations think through what they are going to do, and how they are going to do it.

A simplified model of the QFD matrix and how it is cascaded is illustrated in Figure 1.

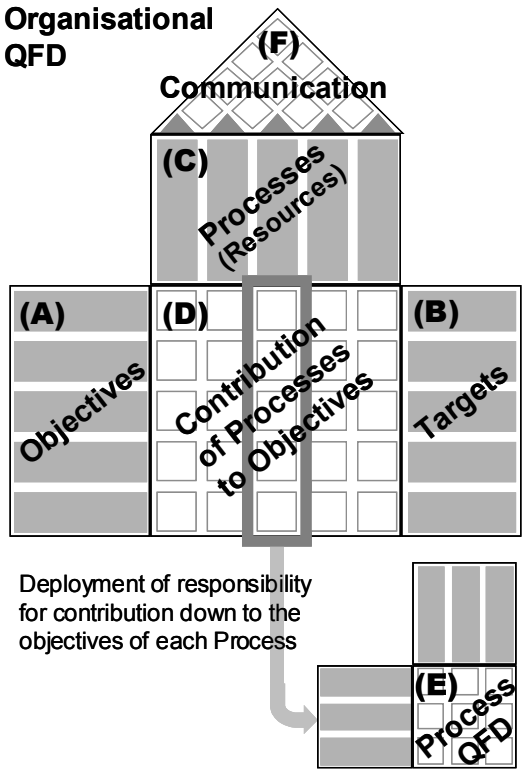

Figure 1: The structure of organisational QFD

It is this matrix that is so powerful in organisation design, enabling the management team to systematically consider all the critical relationships in the business, and to apply all of their ideas and hard-won experience in making them effective. Through the rest of this paper, the letters in brackets in the section headings cross-refer to the letters in brackets on this diagram.

Establishing clear objectives in response to change - (A)

QFD is sometimes referred to as 'the voice of the customer' due to the way it is used to deploy verbatim expectations of the customer base down into the functionality of a product or service. Organisational versions of QFD are somewhat different because the customers of a product or service are not the actually the customers for the design of the organisation that provides them. The customers for the design of the organisation are the people who will need to use that organisation to achieve their aims - the managers of the organisation and of its parent organisations.

In organisational QFD we therefore seek to gather a full verbatim understanding of what the managers and owners need of the organisation and its design. In large part, for WWSC, these were reasonably clear and had been defined through a strategy document commissioned by the parent organisation. However, words can mean different things to different people, particularly when those people may be strong characters with their own perspectives on success. The first step then was to reconcile the different perspectives and perceived opportunities into a commonly understood and shared set of objectives for the organisation.

This was achieved in a number of steps. Firstly, a draft list of objectives was drawn from a series of structured interviews with the team and with key players in the supply chain (the voice of the customer). These draft objectives were then challenged and tested in a facilitated group discussion by considering their potential impact on the stated goals and objectives of the parent organisation.

The draft was then further developed by encouraging people to propose, discuss and reconcile their perspectives on the scope of each objective, on its likely constituent sub-objectives, on the criteria by which it would be judged as being successfully delivered, and on the expected benefits that would accrue from its successful

delivery. This was achieved by means of flipcharts titled with each of the objectives and split into columns headed scope, sub-objectives, success criteria and benefits. In these columns the management team stuck up post-it notes that described what would be really important to them in a final set of objectives. To start with, this was done in silence, but was then reconciled into an agreed shared conclusion through discussion. See Plate 1.

Plate 1: Developing and reconciling clear objectives for WWSC

By the completion of the exercise, all potential interpretations of the objectives had been reconciled into an agreed form of words that collectively represented what the customers of the organisation needed it to achieve.

Determining winning performance targets - (B)

With clarity over what was to be achieved, the team then set about agreeing how well it needed to be achieved. In other words they worked to translate the objectives into an unambiguous set of operational measures (see Lynch and Cross, 1995) and targets which could be used to track progress against the objectives:

- Measures were developed for each objective separately by discussion in syndicate groups. The orthogonal nature of most sets of business objectives ensures that measures are to a large extent mutually exclusive. Each syndicate clarified the key dimension of success for their allotted objective, either by refining existing measures, or by developing new ones. A useful device in the latter case was the 'competition question' exercise which encouraged the syndicate group to consider how it would evaluate 'best' for a mythical competition between five similar organisations each trying to achieve the same thing. The advantage of this exercise is that it separates the creative element of measurement design from the restrictive filtering of 'would I like that same measure applied to me?'
- Targets were set against each of the measures by means of a tool called 'the clothesline'. This is a physical number line created by suspending the range of proposed targets from a piece of string stretched across the room. All members of the team stand under the line at the point where they each individually propose the target should be set. The various positions are discussed, and people move as they feel influenced by the arguments until consensus is reached. A proposed embellishment to the clothesline was to include benchmark data on cards and include them along the length of the line, but unfortunately the idea arose too late to benefit the WWSC discussions.

The process WWSC adopted for establishing its objectives and for translating them into clear measures and targets may seem protracted to many who will read this. It is true that a total of almost 200 man-hours of senior management time were consumed in reaching this point, but by this point, each senior manager understood and was committed to the same set of goals, and knew that his or her colleagues were also. This investment has saved many thousands of lost man-hours in argument, politics, inefficiency and mistrust, and has enabled the group to commit to objectives that would otherwise have been impractical. Furthermore, the reason that 200 man hours of debate were consumed was that this was simply what was required to resolve the important issues and differences - issues and differences that would otherwise have remained unaddressed and which would undermine and negate the efforts put in to pursue the objectives.

Optimising and organising resources - (C)

Having clearly defined the objectives (the 'Whats'), the next step in QFD is to define the mechanisms by which they will be delivered (the 'Hows'). In an organisational QFD these 'mechanisms' translate into the key business processes of the

organisations - the patterns of work and activities that deliver the outputs of the organisation.

The conventional business processes for a supply chain organisation are fairly well defined, and for WWSC these provided a very good starting point for appointing people to roles, and for getting them to think through the boundaries of their process responsibilities and what was needed to make it happen. Each member of the management team was tasked with considering one process, and to break it down into the key activities that it comprised.

Having thus defined the draft processes, adjustments were made by asking each manager to translate the key current activities and responsibilities of their process onto post-it notes and place them in a column on the wall under their process title. The team were then invited to identify any overlaps or gaps, and to introduce new post-it notes or move them around accordingly. Final reconciliation of each process was achieved by discussion - initially in plenary and then by having each manager meet with each other to clarify the boundaries between their processes and the qualities of any inputs or outputs that crossed those boundaries.

It is relatively easy within organisational QFD to be quite radical about the design of the process model adopted, and in many situations this can provide a significant competitive edge (Hammer, 2004). In this situation however, WWSC wisely concluded that there was enough potential in existing supply chain models, and that there was considerable danger in changing too many variables at once.

Focusing potential on priority strategies - (D)

The heart of a QFD lies in the matrix (or grid) that relates the objectives (the 'Whats') to the mechanisms (the 'Hows') - the logical map of 'deployment' (see Brassard, 1996). Organisational QFD is no exception. The matrix provides an opportunity for the management team to consider how to maximise the potential of every process, to identify creative new opportunities, to explore how they will ensure each and every goal, and to adopt individual and collective responsibility for everything that happens. It is here that organisational learning and experience can be worked into new ideas, while sacred cows, pet theories and myths are challenged, found wanting, and abandoned.

WWSC worked through the matrix of their QFD cell by cell, discussing the potential impact of each process (constructive and detrimental) on each and every objective. As a result, managers understood the workings of the organisation, the role of their colleagues, and the implications of their own behaviours to a level far beyond anything they had previously experienced. New insights were formed, new ideas arose, and new alliances were forged. Consensus was developed by means of using voting cards to understand the range of perspectives that existed, and then drawing out the differing opinions until a conclusion had been reached and a final value could be agreed. However, the real value was not in this final 'value' but in the record of the debate (transcribed by support staff during the debate) which contained both recorded experience and new insights for the teams that were to develop each process.

Following the development of the grid, each manager was asked to develop a 'rich picture' for their process. A 'rich picture' is a means of representing a situation graphically, normally by means of colourfully drawn images on a flipchart. This involved them reflecting back on the opportunities in their column of the QFD, and on the interdependencies between processes, and translating this into a set of images of what excellence would mean for their process. It was a way of consolidating the learning from the discussions into a vision for their work; a way of reinforcing the left-brain logic with the more emotions based right-brain visualising. The end result was very effective in stirring up energy and determination; for developing even more enthusiasm for taking things forward.

Harnessing the commitment and ideas of the whole organisation - (E)

Having established the top-level model of the organisation, the next step was to cascade it down into the rest of the organisation. It was agreed to do this by means of one big event: a cascade workshop where the separate process teams could both work on their own, and with other processes, as they required.

To run such a cascade successfully requires that each process manager knows exactly what he or she is trying to achieve with their team through the workshop, and takes full responsibility for using the structure and opportunities of the workshop to achieve it. Accordingly, it was made very clear that each manager was responsible for developing their own performance targets and process QFD with their team in whatever way they chose to do so, but that the cascade workshop would provide a useful vehicle for getting most of their work done - if they were suitably prepared to make full use of it.

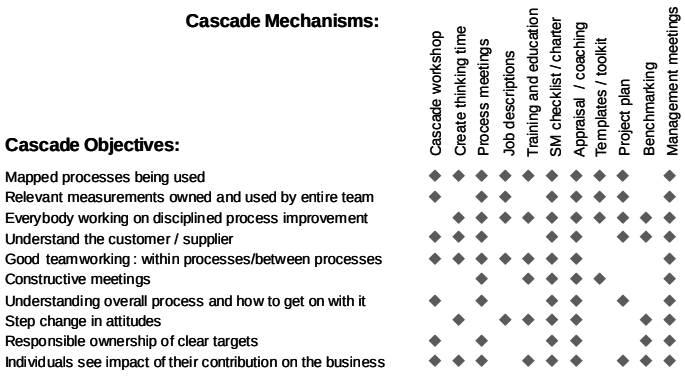

Figure 2: Map of responsibility for ensuring effective cascade of QFD

Figure 2 reflects how the cascade workshop as simply one mechanism among many that the process owner would need to employ, if they were to develop full ownership for the agreed performance levels and approach within their people. An indication of what such ownership entails can be found in the book 'Business Process Analysis' (Darnton and Darnton, 1997).

The workshop was developed with a subgroup of the management team, and was entirely led by them. Most of them were already very experienced in QFD and systematic approaches, and they wanted their full ownership of the event to signal that this was their way of managing, and not some separate consultancy approach driven by an outsider. The result of their ownership and commitment to the workshop was awesome in its effect on the commitment of their people and the quality of the work that their people produced.

The photographs (Clargo, 2002) illustrate the various activities in the workshop, which was largely structured as follows:

- An introduction: to the workshop and to QFD; to the opportunities facing the organisation as a whole; and to the role of their particular process in meeting those opportunities.
- Within the process teams, each team member then had an opportunity to contribute their own ideas on how the process could fulfil its potential and to build further understanding and ownership through this. See Plate 2.
- The tables were then rearranged to facilitate a sequence of timed meetings where each process team met with each other process team to discuss how they needed to work together and what their interdependencies were. This helped to ensure that each process team developed a well balanced set of objectives that were complementary and supportive of other process teams, and avoided the problems created when process teams single-mindedly focus on narrow objectives to the detriment of their colleagues. See Plate 3.
- Each process team then worked individually to develop a high-level process map (flow diagram) of their process, reflecting the responsibilities of the top-level QFD and the key interdependencies with other processes. Where it transpired that key inputs and outputs had been forgotten, members of each process team could discuss and agree these with other processes 'on the hoof'.

Plate 2: Process teams discuss their potential contribution to WWSC's objectives

Plate 3: Process teams meet each other to agree interdependencies

- Each process team then defined a set of clear objectives for their process (using post-it notes from earlier sessions supplemented by further ideas from the process mapping) and developed appropriate measures (using the competition question) and performance targets (using a clothesline) for each of these. See Plate 4.

Plate 4: Process teams reach consensus on targets using the clothesline method

At this point, each process within WWSC had developed its own perspective on how the top level WWSC objectives and targets deployed down to responsibilities for their process. The steps to this ensured that the objectives were developed and owned by each process team, rather than imposed on them by management. This fostered a high level of creativity and commitment in pursuing those goals.

Ensuring success through effective communication - (F)

However, the fact that each process was committed to a set of goals that they had derived logically from the QFD did not guarantee that the goals were the right ones. It is entirely possible for a group of processes to entirely omit a key responsibility, each believing it is the responsibility of someone else.

In organisational QFD, this risk is addressed by a process known as reconciliation. This involves syndicates looking across the process for commitments for each objective, and determining whether the compound effect is enough to ensure the top level objective is delivered. WWSC undertook their reconciliation within the cascade workshop using the following steps:

- Each process team developed a sheet for each of the organisation's objectives (one sheet for each cell in their column of the QFD) and listed out on it the specific measures and targets for their process that they believed would have an impact on the attainment of that top level objective. These sheets were collected centrally and divided into piles for each objective - each pile containing a contribution from each process
- The workshop then re-organised into six syndicates, each looking at one objective for the organisation and the proposed process contributions to achieving it. Each syndicate discussed whether the process contributions collectively ensured the top-level objective. If not, they discussed what more was needed, and where appropriate they made counter proposals on the relevant process contribution sheets. The results of each syndicate were fed back to the main group, and the process owners were asked if they approved the amendments to their process objectives and targets. Because the teams that made these recommendations included a representative from the process team, this proved to be fairly straightforward and, following a small amount of in-team discussion, each proposal was accepted without a problem.
- Having defined their objectives and had them approved, the processes then worked through a series of one-on-one process discussions to agree the level of inter-process communication that was required. These discussions concerned developing the roof of the QFD, a half matrix, triangular in shape, which sits on top of the columns of the QFD matrix (the processes in an organisational QFD) and explores the extent to which each process is in conflict or synergy with its neighbours, and thereby what communication (if any) needed to be set up between each pair of processes.
- The workshop finished with each process team developing their own composite rich picture for their process, and gathering all their outputs and conclusions into a display. Everybody was then given the opportunity to wander round the displays, and discuss the conclusions with a process team member; manning each display on a rota basis

In terms of building understanding and commitment, the cascade workshop was a great success, and received a great deal of positive feedback from those attending it. Following the workshop, WWSC developed reporting and meeting processes to make best use of the QFD and the insights that had been gained through it. These focused on measures of performance against target, and used the QFD matrix both to trace top-level performance issues

back into areas of weakness in the processes, and to identify new strategies to address these.

Results

Following the workshop, each process team has made tremendous progress on implementing their conclusions, and the organisation is well on its way to achieving its vision of best-in-class response times with minimal stock and zero defects.

Since the QFD workshop to design WWSC, on-time delivery has increased from 30% to over 90%, lead time for parts orders has reduced from 500 hours to 200 hours, cost savings of over $3M per annum have been generated, and the effective inventory cost (based on the average time material or components spend in the business between purchase and sale) has been halved.

Those are the hard benefits, but the soft benefits are even greater: WWSC now has a management and planning process that is capable of turning round any business challenge just as effectively, and a management team that is eager to do so. It is fundamentally 'equipped for change'.

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Biography: Michael Clargo is a management consultant specialising in the application of design tools to organisation development. Since 1988, he has assisted over 30 well known companies transform their performance and culture, and has gained an international reputation for his progressive and open approach to consulting. His work and research on the strategic, methodical improvement of management processes has addressed all aspects of general, industrial, technology and alliance management in industries as varied as metal processing, electronics, healthcare, aerospace, retail, pharmaceuticals, food, transport, chemicals, utilities, information, engineering, and contract R&D. He is the author of 'Managing by Design: Using QFD to transform management performance', published by Tesseracts, ISBN 0 9543021 0 9, from which some of this case study has been extracted. Further information on the application of QFD to organisation design can be found on the Tesseracts website: www.tesseracts.com