

Федеральное агентство по образованию

Санкт-Петербургский государственный электротехнический
университет “ЛЭТИ”

С.О. ШАПОШНИКОВ

СОВЕРШЕНСТВО В БИЗНЕСЕ
(на английском языке)

BUSINESS EXCELLENCE
(in English)

Учебное пособие

Санкт-Петербург

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УДК
ББК
Ш 23

Шапошников С.О. Совершенство в бизнесе (на английском языке).
Business Excellence: Учеб. Ш 23 пособие. СПб: Изд-во СПбГЭТУ “ЛЭТИ”,
2008. 92 с.

ISBN 5-7629-0670-1

Является основным учебным пособием по дисциплине “Совершенство в бизнесе”, преподаваемой на английском языке. Содержит оригинальные тексты на английском языке, тематически связанные с вопросами достижения высокого качества в бизнесе за счет использования различных моделей обеспечения качества общем контексте менеджмента и систем качества, и задания, ориентированные на активное использование профессиональной лексики в предметной области.

Цель издания – изучение методики достижения совершенства в бизнесе и развитие навыков владения профессиональным английским языком для специалистов в области менеджмента и систем качества.

Предназначено для студентов факультета экономики и менеджмента.

УДК 42
ББК Ш 143.21

Рецензенты: кафедра лингвистики и перевода Невского института языка и культуры,
ст. препод. С.В. Федорова (СПб Горный институт (Технический университет)).

Утверждено

редакционно-издательским советом университета
в качестве учебного пособия

ISBN 5-7629-0670-1
2008

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ВВЕДЕНИЕ

Учебное пособие “Совершенство в бизнесе” (“Business Excellence”) на английском языке предназначено для студентов, обучающихся в магистратуре по направлению «Менеджмент систем качества и инноваций» и изучающих английский язык с целью совершенствования практических навыков и умений, необходимых при профессиональном общении в области менеджмента и систем качества. Функционально-коммуникативный подход, используемый в настоящем издании, позволяет не только достичь более высокого уровня владения профессиональной англоязычной лексикой, но и значительно успешнее подготовить обучаемых к будущей деятельности.

Учебное пособие содержит оригинальные тексты на английском языке, тематически связанные с вопросами достижения совершенства в бизнесе в общем контексте менеджмента и систем качества. Работа студентов с пособием базируется на чтении и анализе текстов из современных статей, опубликованных в журналах, газетах и на сайтах в сети Интернет и касающихся использования моделей обеспечения совершенства в бизнесе. Учебное пособие может быть использовано как в качестве дополнительного материала к учебникам по профессиональному английскому языку, так и самостоятельно.

Большинство разделов (тематических уроков) учебного пособия содержит после текстовой части перечни новых профессиональных терминов и выражений, знание которых необходимо для прочного усвоения материалов этих разделов.

Предлагаемые в каждом разделе пособия задания ориентированы прежде всего на активизацию речемыслительной деятельности обучаемых. Поэтапное освоение материала от чтения к дискуссии через системы определенных речемыслительных действий – анализ, оценку, комментирование, обобщение и т. д. – позволяет подвести обучаемых к принятию самостоятельных решений при разработке проектов, документации и деловом общении в сфере менеджмента и систем качества, включая проведение переговоров с зарубежными партнерами, ведение деловой переписки, подготовку и экспертизу материалов и документов.

Module 1.

Lesson 1. Introduction to Business Excellence.

Definitions of Excellence

As defined by the Wikipedia¹, “Excellence is the state or quality of excelling. It is superiority, or the state of being good to a high degree. Excellence is considered to be a value by many organizations, in particular by schools and other institutions of education, and a goal to be pursued”.

Another definition of Excellence (uncountable) can be found in the Wiktionary²:

- “The quality of being excellent; state of possessing good qualities in an eminent degree; exalted merit; superiority in virtue.
- Something in which one excels.
- An excellent or valuable quality; that by which any one excels or is eminent; a virtue”.

The same source defines the synonyms of Excellence as superiority, pre-eminence, perfection, worth, goodness, purity, greatness. One can also find interesting quotations on Excellence in the Answers.com³:

"The principle is competing against yourself. It is about self improvement, about being better than you were the day before." - Steve Young.

"It isn't what you do, but how you do it." - John Wooden.

"My philosophy is that not only are you responsible for your life, but doing the best at this moment puts you in the best place for the next moment." - Oprah Winfrey.

"Surely a man has come to himself only when he has found the best that is in him, and has satisfied his heart with the highest achievement he is fit for." - Woodrow T. Wilson.

¹ <http://en.wikipedia.org/wiki/Excellence>

² <http://en.wiktionary.org/wiki/excellence>

³ <http://www.answers.com/topic/excellence>

And one more quotation from Aristotle: “Excellence is an art won by training and habituation. We do not act rightly because we have virtue or excellence, but we rather have those because we have acted rightly. We are what we repeatedly do. Excellence, then, is not an act but a habit.”

Excellence begins when we know that being good or even competent will not carry the day, when doing more or trying harder will not bridge the gap, when excellence is simply the only alternative.

All of us have had moments when we succeed seemingly without effort, times when we perform superbly and gracefully, times when we hit the mark. Yet we are never quite sure how it all came together, how it happened, or if we can make it happen again.

“Excellence is not a matter of ability, knowledge or practice. It cannot be taught, imposed, or wished into existence. Excellence is a matter of the stand we are and the stand we take—a stand that allows for performance that surpasses what was previously possible, performance that defies old limits and maps new territory”⁴.

Today, many organizations are searching for Excellence but not many organizations have been able to achieve this goal, seemingly because management does not have a profound understanding what it really means to be excellent. Since 1982, when Peters and Waterman published their famous book “In Search of Excellence - Lessons from America’s Best-Run Companies”, there have been many suggestions for a definition of Excellence in business, and for the success criteria behind excellence.

Organizational excellence can nowadays be defined as: “The overall way of working that balances stakeholder concerns and increases the probability of long-term organizational success through operational, customer-related, financial and marketplace performance excellence.”

There is general understanding today that truly excellent organizations are measured by their ability to achieve and sustain outstanding results for all their

⁴ http://www.landmarkededucation.com/display_content.jsp?top=22&mid=175&bottom=219&subsection=515

stakeholders, such as customers, employees, shareholders and the community. This requires a management approach based on eight fundamental concepts⁵:

- **Results Orientation:** The needs of stakeholders are met and balanced. Stakeholders may include employees, customers, suppliers, shareholders and society.
- **Customer Focus:** There is a clear understanding of the needs of both current and potential customers, and a passion for meeting needs and exceeding expectations.
- **Leadership and Constancy of Purpose:** Leaders have a clear sense of direction and purpose, which they communicate effectively throughout the organization.
- **Management by Process and Facts:** All activities are managed in a systematic and effective way, taking into account all stakeholders' perceptions.
- **People Development and Involvement:** A culture of trust and empowerment that allows all employees to develop and contribute to their full potential.
- **Continuous Learning, Improvement and Innovation:** Knowledge is shared to maximize performance, with learning, innovation and improvement encouraged.
- **Partnership Development:** There are mutually beneficial relationships with all partners.
- **Public Responsibility:** The organization fosters a positive and mutually beneficial relationship with society and the community.

These are the fundamental concepts. Depending upon the area of application the concepts or principles can be adapted to serve better the needs of the business. For example, the nine elements of education excellence as stated by the State Farm Insurance Company⁶ are:

⁵ http://www.quality-foundation.co.uk/ex_fundamentalconcepts.htm

⁶ http://www.statefarm.com/about/part_spos/community/ed_excel/ed_excel.asp

1. **Safety and discipline.** Physical security and a structured, well-managed program are essential to learning.

2. **Parent involvement.** Involved parents support the learning process, influence schools and make choices about their children's education.

3. **Standards.** Standards are expectations clearly defined in measurable terms. Academic standards clearly state what students need to know and be able to do to succeed in school, in the workplace and in life. A successful system aligns and focuses its policies and programs on student's achievement of high academic standards.

4. **Assessments.** Assessments are result-oriented measurements of student, school and system performance. Assessments give students, teachers, parents and the public meaningful feedback that they can use. A successful system aligns its standards and assessments.

5. **Learning readiness.** Learning readiness recognizes the importance of helping make sure that children are able learn before they come to school. Learning barriers caused by poverty, neglect, violence or health issues are addressed through strong partnerships between public and private agencies, and by providing meaningful, high-quality pre-kindergarten education for all children

6. **Accountability.** Accountability is the system of consequences for policymakers, educators, and students based on demonstrated performance. It should encompass the curriculum, instruction and time necessary for students to be successful, and it should focus on helping struggling schools and students. An aligned accountability system also rewards exemplary schools and teachers, and works to change those that persistently fail to educate their students.

7. **Technology.** Technology is a tool that should be used to improve learning and productivity, broaden access to knowledge and help teachers, parents and students maximize the opportunities for students to achieve their goals.

8. Professional development. Teachers and administrators need meaningful preparation and continuing education focused on content knowledge, improved teaching skills and school management.

9. School autonomy. School autonomy gives individual schools the responsibility to make the decisions needed to achieve high performance and accountability.

All organizations, small or large, profit or not for profit, can be described as having four elements; a constant (an invariant – or relatively so - core element; the organization aim) and three variables (stakeholders, the interests/wants and expectations of those stakeholders and the organization environment which contains the universe of interested/affected parties from which stakeholders are drawn). The way in which an organization behaves is determined by its *raison d'etre* - how it sees itself, and how it interprets its environment. Moreover, the way in which that environment will appear to an organization, and the nature of the organization's reaction to that environment, depends on the perspective taken. Of the very many ways in which an organization may look at its environment, two may be identified as dominant - that which has the market and competitors as its primary focus, and that which has a primary focus on the socio/political/economic environment, and stakeholders. Stakeholders are that sub-set of the universe of interested/affected parties that an organization believes capable of causing it to fail or inflicting unacceptable cost/damage if their wants are not met. Stakeholders are distinguished from the universe of interested/affected parties by having both the means of bringing their interests/wants to the attention of the organization, and for taking action if those wants are not met.

Stakeholder interests are often very different, in conflict, and in flux. Moreover, the means by which stakeholder wants and expectations are expressed and met can take a wide variety of forms, including politics, collaboration, cooperation and bargaining. Although addressing the same issues, the competitor and stakeholder

perspectives produce very different organization behavior, and performance, suggest the need for different models of management.

There now seems to be widespread agreement that few organizations could anticipate sustained success if explicit strategic attention were not given to shareholders, management, employees, customers, the physical environment, suppliers, government and the local community. There seems to be similar agreement that any list of issues on which all, or some, of those stakeholders, would need to be satisfied (and increasingly by the presentation of information on an organization's actions and plans in the form of an independent audit) in order to prevent them behaving in a way that would threaten enterprise viability, would include:

- Financial probity – however imperfectly it is presently measured, financial probity appears to be of growing importance to all stakeholders.
- Risk – different from uncertainty, risk is present in every enterprise decision and, as a consequence, is likely to be of interest to all stakeholders. The recent emergence of managers and employees as major shareholders (investors), and employees as the dominant source of capital, has heightened that interest.
- Quality of product and service – though of direct and immediate concern to customers, the quality of an organization's product or service is now widely recognized as being of interest to all stakeholders.
- Health and safety – the well being of employees is now clearly associated with organization success and policies directed to improving employee well being is of concern to all stakeholders.
- Profit/shareholder value – from being viewed in isolation and constrained only by resource limitation and market forces, profit is now almost universally considered among the interests of more than one stakeholder. Profit may now be constrained by resource limitations, market forces, regulatory forces, and the exigency to meet the wants of other stakeholders.

- Environmental impact – though it is often difficult to identify the environmental stakeholder consideration of the physical environment is now a strategic imperative for many organizations and the impact of the organization on the environment is of concern to many, if not all stakeholders.
- Knowledge [intellectual capital] – given the importance of knowledge (in all its forms) both as the principal asset of an enterprise and the basis for redefining the enterprise it can be only a short time before all stakeholders will demand that management have (and communicate) policies for its identification, creation and expansion.
- Ethics – recent emphasis on corporate probity and social accountability has given a new prominence to organization ethics. Increasingly the ethics of an organization is influencing the decisions of all stakeholders. However, very often those who raise the issue of ethics are actually addressing either legal issues or moral issues. As a result those discussions have the effect of diminishing the value of ethical studies, which address the true ethical dilemma where organizations must grapple not with right and wrong, but with issues of social welfare and Pareto optimality.
- Innovation – rooted in the Intellectual Capital of the enterprise, innovative capacity (or innovativeness) is central to organization success and prospects and of concern to all stakeholders.
- Data integrity/security - the ability of the enterprise to merge and manipulate [and sell] data relating to customers, suppliers and employees, has become a major concern to those stakeholders.
- Plans, planning and strategy - the ability to plan and develop strategies is an essential element of organization activity and is likely to be of interest to all stakeholders.

- Reputation – while it may be difficult to assess there seems little doubt that reputation or the way in which an organization is viewed by each of its stakeholders can have a significant bearing on sustainability.

Today's manager faces accelerating change, increased complexity, volatility and ambiguity. A necessary response to that situation is to seek help from fellow practitioners, professional organizations, management thinkers, consultants and more recently, management system standards such as ISO 9000.

Module 1.

Lesson 2. Introduction to Business Excellence Models⁷

2.1. Introduction

Business Excellence is not just another initiative but a way of pulling several initiatives together in a focused and practical way. There is wide-ranging evidence from around the world that supports the benefits to be gained from following a philosophy of Excellence in Business. On the other hand, recent studies indicate that if the aim is business improvement, participation in a quality award process is not always the most appropriate methodology for achieving that aim. Many organizations do not have sufficient resources to carry out the improvement work that is required by the award process.

Business Excellence Models (BEMs) are often viewed as benchmarks for good management practice and therefore used for organization self assessment. Most of these models are also frameworks for different quality awards and thereby have a strong customer focus and conformity with major constituents of Quality Management. But if Quality Management is seen as a constrained optimization subject to meeting the needs and expectations of non-customer stakeholders, then

⁷ Based on lecture materials presented by Prof. Su Mi Park Dahlgaard and Prof. Jens J. Dahlgaard, Institute of Service Management, Division of Quality Technology and Management, Lund University, Linköping University Sweden at the Summer School'06 on Total Quality Management at SPb ETU, St.Petersburg, Russia

obviously customer focus is not enough for long-term success of the organization (i.e., business excellence) and a stakeholder approach needs to be introduced.

Shifting focus from customers to a larger group of stakeholders has been an ongoing trend for some time within the quality movement. The institutions behind a large part of the national and international quality awards now claim to have moved from a narrow focus on quality toward broader perspectives such as those of “business excellence” or “performance excellence”, hence the name Business Excellence Models. However, the foundations of most model frameworks still remain. At their center are criteria for organization assessment based on values which can usually be traced back to those of TQM. Over time many of these models have been influenced by stakeholder theory and, as a result, issues such as social responsibility and environmental protection have been added to the criteria, or become more emphasized.

One reason for this shift of focus is a perception that sustainable organization success requires more than satisfied customers. Depending on the context it could involve focus on actors such as employees, neighbors, society, suppliers, competitors, nature, media and financial institutions. Another reason for shifting toward a stakeholder approach is the ongoing movement from firm-centered to system-centered thinking. In order to have a global sustainable development the role and responsibility of business has to change from that of “doing no harm” to “demonstrating positive benefits,” or in other words being a good corporate citizen.

Research carried out by the European Center for Business Excellence reveals overwhelming verification of the links between Excellence, improved business performance and outstanding business results. A study of European companies using the concepts of Excellence showed that these companies out-performed their industry median, on four different financial indicators over a five year period. For example, profit per employee in 79% of the companies was higher, 76% of the companies had a higher return on assets and 76% of the companies showed higher profit margins than

their industry medians. A study of the Japanese Deming Prize-winners between 1961 and 1980 concluded that most companies had an upward trend in all key performance indicators and maintained this performance above the industry average.

2.2. Business Excellence Models. The 7S Model.

The *7S Framework* was created by Robert H. Waterman, Julien R. Phillips, and Tom Peters. It can serve as a starting analysis model or framework. Typically, the 7S model is used in large corporations. Often, those companies have a hard time getting a handle on their situation and their potential because they are fragmented across continents, business units, confusing conglomerates, or constant acquisition and shuffling. The 7S model gives the multifaceted company a single set of metrics with which to analyze.

The 7S are a group of interrelated categories which make up an organization. Like rowers in a boat, when they are all aligned, a business will likely succeed, prosper, innovate, and move in the direction it wants to move. When these factors are not aligned the business can fail, remain stagnant, reach maturity or decline quickly, or flounder about. The models comprised the following seven success criteria for excellence divided into two groups. The first group is **Hardware** and its elements are:

1. **Structure.** This is more than just the stated hierarchy of the organization. This is the "in practice" hierarchy, too. Is a business focused on the customer? Is it segmented by function? Is it segmented by geography? Is it top heavy with a lot of decision-making executives?
2. **Strategy.** Strategy deals with tomorrow - what is the company planning on achieving in the future and what are they doing today to prepare for those goals?

The second group of criteria is **Software**. Its elements are:

3. **Systems.** This is the process through which the company gathers information and makes decisions. If it is effective, a company can react quickly and appropriately to

changes in the marketplace. If a company's systems are not adequate, the company stands the risk of being ponderous.

4. **Shared Values.** This category talks about the overarching purpose in the organization more specifically, it deals with the real or practiced values and compares them to the stated values. A company, for example, may claim to be customer-centered but in reality it could reward staff for high volumes of sales, encouraging staff to ignore the customer and focus on making their numbers.

5. **Skills.** This is the collective skill set of the organization. If a company determines to hire only people who can speak two or more languages, they will quickly fill their ranks with skilled people who allow them to communicate to other people more effectively. Some companies in the early growth stages can react to a need by hiring too many people in one skill category and run the risk down the road of having a variety of absent skills. There is no perfect mix, this is a matter of constantly balancing and rebalancing based on need.

6. **Staff.** This category, obviously, deals with the people in the organization. It involves not only their skills (mentioned in another S) but also whether or not there are enough (or too many) staff members to do the job as well as the personal and professional goals that each person has.

7. **Style.** This category is about the culture of the company. Is it aggressive? Is it conservative? Is it innovative? Is everyone happy? Does the company feel bloated and unwieldy? Each company has its own style and that style is set by the leadership and supported (or changed) by the mix of staff hired.

As was observed by some authors managers are getting more done if they pay attention with seven S's instead of just two (the hardware criteria), and real change in large institutions is a function of how management understands and handles the complexities of the 7-S Model.. We shall also bear in mind that *soft is hard* meaning that it is the software criteria of the model which often are overlooked and which should have the highest focus when embarking on the journey to excellence.

We know today that many of the excellent companies (America's Best-Run Companies) later on became unsuccessful. This observation tells us what should be obvious that any model and/or lists of attributes have limitations, because they are always simplifications of reality (the context) in which the companies are operating. Hence, the observation also tells us that there is a need to analyze the 7-S Model and to compare with later excellence models which may have been designed in response to the problems and new knowledge acquired when companies have struggled to adopt or adapt early versions of excellence models and/or lists of excellence attributes. Thus, the first purpose of this lesson is to present some well known excellence frameworks or models in order to understand the development in the contents of excellence during the last 25 years and to understand the problems or limitations which such kind of models still have. To complement early findings we have chosen to present the following Excellence Models: the Xerox Excellence Model representing one of the early excellence pioneering companies, and the European Excellence Model as a representative of international quality award models.

Another purpose of the lesson is to present and discuss a relatively new quality strategy model (*the "4P" Model*) for achieving Organizational Excellence. The basic assumption behind the model is that Organizational Excellence is a result of building excellence into the following "4P" - People, Partnership, Processes and Products. The suggested model is compared with another "4P" model – the "4P Model of the Toyota Production System" – which focuses on the following 4Ps: Philosophy, Process, People and Partners, Problem Solving. As Toyota is regarded as the most excellent company within the car industry today and maybe the best managed company in the world, it is logical to recognize the Toyota "4P" Model as an example of today's excellence models.

2.3. Search for an Excellence Model

Peters and Waterman [1] identified the following eight attributes which

characterized the excellent, innovative companies in their study:

1. A **bias for action**, meaning that although companies' approach to decision making may be analytical, they emphasize the importance of experiments. It is believed that too many detailed analyses may be barriers against problem solving. Thus their approaches to solve problems and challenges are often experimental and dealt with immediately or in a relatively short time through establishment of cross functional teams where also external partners like customers or suppliers may participate.
2. **Close to the customer**, meaning that the successful companies really listen to the voice of the customer and also use the voices as input for continuous improvements and new product and service development.
3. **Autonomy and entrepreneurship**, meaning that all employees - not only people in R & D - are expected to be creative and innovative in their daily jobs.
4. **Productivity through people**, meaning that people are expected to come up with ideas for waste reductions and productivity growth by providing the proper framework i.e. respect, involvement and empowerment.
5. **Hands-on, value driven**, meaning that the company's philosophy, vision and values are seen as the main guideline and to be far more important than technological or economic resources for the daily activities and challenges.
6. **Stick to the knitting**, meaning that the excellent companies stay close to the business they know.
7. **Simple form, lean staff**, meaning that the underlying structural forms and systems in the excellent companies are simple and top-level staffs are lean.
8. **Simultaneous loose-tight properties**, meaning that the excellent companies are both centralized and decentralized. On the one hand, they have pushed autonomy down to the shop floor or product development teams, and on the other hand, they are fanatic centralists around the few core values they hold dear.

T. Peters and N. Austin published in 1985 the second book on Excellence called “A Passion for Excellence” [2] in which they presented the simple model or scheme shown in figure 1 below.

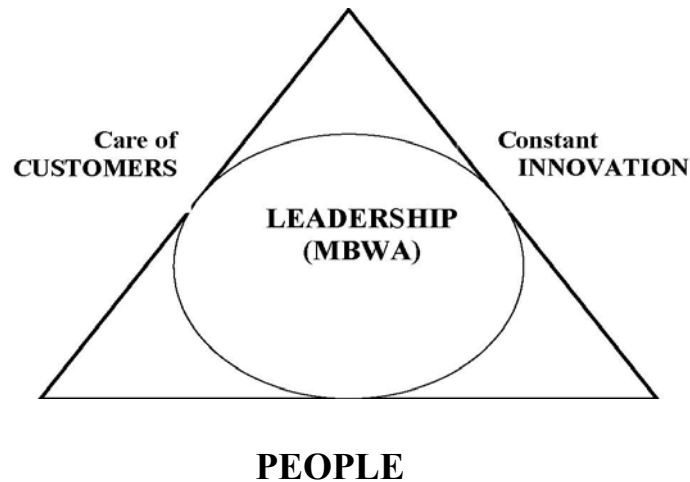


Figure 1: A Simple Model of Excellence

As indicated in figure 1, excellence is regarded as being the result of the following 4 critical success factors:

1. *PEOPLE*, who practice;
2. *Care of CUSTOMERS* and
3. *Constant INNOVATION*.
4. *LEADERSHIP* which binds together the first three factors by using *MBWA* (Management by Wandering Around) at all levels of the organization.

2.4. Lists of Best Practices

Lists of excellence typically describe the key enabler characteristics, which differentiate organizations with excellent results from organizations with mediocre or poor results. The British Quality Foundation (BQF) published such a list in 1998, and the differentiating characteristics (criteria) were shown as follows:

1. Management commitment to the business excellence ‘journey’;
2. Effective strategic planning;

3. An emphasis on people issues through empowerment and training;
4. Unprecedented levels of employee participation through effective communication of and involvement in the organization's goals, mission and objectives;
5. Process understanding, management, measurement and improvement;
6. Deliberately avoiding 'jargon' to ensure a seamless integration of business excellence practices;
7. Nurturing a culture which focuses implicitly and explicitly on anticipating and serving customers' needs;
8. Demonstrating concern for better environment management;
9. Making the internal spread of best practice contagious.

Lists like the BQF list, or Peters & Waterman's list on eight characteristics concerning *organizational excellence* or *best practices*, can be found in several areas of the literature. Such lists may be valuable for organizations, but they may also be misleading. Managers may misunderstand that the shown characteristics are exhaustive, and they may not understand the interrelationships and logical linkages between them, as the lists mixtures various elements together and do not provide a proper guiding framework.

Harrington [3] reports on 60 organizations from Japan, Germany, US and Canada which he and others at that time (1987) believed were setting the standards for *best management practices*.

The analyses of this study showed that only five practices were significant when correlated with performance where performance were measured with *Return on Investment*, *Profits*, *Value Added per Employee*, and *Customer Satisfaction*. These performance measures were measures on profitability, productivity and quality.

The five *universal best practices* were the following:

1. Cycle-time analysis;

2. Process value analysis;
3. Process simplification;
4. Strategic Planning (Deploying the Strategic plan);
5. Formal supplier certification programs.

Organizations that made frequent use of *Process Improvement methods* (1, 2. and 3.) tended to have higher performance than the other organizations, and the positive impact was on all performance measures -profitability, productivity and quality.

Regarding *Strategic Planning* the statistical analyses showed that *widespread understanding of the strategic plan by people inside and outside the organization had a broad beneficial impact. The two groups whose understanding showed the strongest impact on performance are middle management (or the medical staff among the hospitals in the study) and customers. Understanding of the plan by suppliers was also generally beneficial.*

In too many cases the top management still do not use enough time and resources to involve lower management in a real *Policy Deployment* process where lower management are invited to comment and come up with suggestions for improvement of the company's strategic plan (*Hoshin Planning with Catch Ball* [4]). We regard such a process as one of the critical indicators of excellence, and as one of the most critical pre-conditions for a real people involvement.

Another important finding in the study was that many of the practices considered being basic principles of the quality movement (TQM, Six Sigma, etc.) proved to be ineffective or even detrimental under certain conditions. Examples were empowerment of the workforce, use of natural work teams, benchmarking, eliminating quality control inspection, and not inspecting quality into the product service. The conditions for what is a best practice depend on the company's situation. The analyses proved that *it takes a very different set of activities and beliefs to move a low-performing up to the medium-performance level than it does to move a medium performing organization up to the high-performance level.*

We agree that organizations should be very critical against long lists of so-called best practices. It is always better to identify what are the most important general principles for achieving excellence in the long run, and then use these general principles as the basic work principles when specific practices are being tailored to organizational contexts.

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Module 1

Lesson 3. The Fundamental Concepts of Excellence

3.1. Introduction

Approaches to quality in business have emerged and evolved over the past fifty or sixty years. Techniques and approaches, generally accepted to form part of the business quality movement, include Deming's fourteen principles; Six Sigma; benchmarking and the Baldrige and other excellence awards and frameworks. These approaches are united by their common objective: adjusting business processes to increase the probability of realizing successful business outcomes.

Developments in quality have been a logical progression or evolution each building, and indeed depending, on the last and responding to changes in the business environment. This perspective allows us to place recent research on sustainable development and its link to business success in the context of other developments in the quality movement. It also prepares the ground for us to consider what the next step in the quality evolution may be.

Approaches to business quality can be viewed in terms of the ambit or scope of their influence in the business. As the quality movement has matured, the approaches taken have expanded their influence from the minute considerations of process variation and control to the more strategic considerations of the 'fit' between marketing and production.

Viewed in this way, the first wave of quality approaches in business focused on achieving consistency. Variations in product quality were carefully tracked and eliminated, delivering new competitive advantages to business at a time of huge growth in mass production of low cost units and markets that attached value to reliability. Of course, advances in information and communications technology mean that this 'first wave' approach continues to become more sophisticated.

The second wave of quality approaches in business focused on continual alignment. The business excellence movement, complimented by approaches such as benchmarking, sought to encourage businesses to review, critique and modify their processes. This introspection was designed to encourage businesses to embrace change and to ensure that each and every part of the business was in a continual state of readiness to adapt, and also achieve an optimal degree of internal complementarity with other parts of the business. While awards programs may have provoked the initial wave of this thinking, the questions of adoption and alignment have been pushed further in areas such as the supply chain, where businesses have pursued customer and supplier relationships that result in greater satisfaction and less waste.

Sustainability is the third wave in quality approaches as it extends the alignment principle to a much broader stakeholder context.

3.2. What has driven the evolutionary process?

Evolution is driven by a need or benefit and is often stimulated by a change of some kind. So what changes in the business environment might have caused the evolutionary transitions? We suggest a range of drivers for this change, listed below.

Reach. The processes of globalization and technology change have resulted in organizations of all sizes operating through more complex and extensive networks for raw materials sourcing, manufacturing, supply and distribution, and services. This increased organizational 'reach' is most apparent and most talked about for large multi-national enterprises however the significance of small to medium sized businesses in this aspect should not be discounted. The impact of business activities are felt in diverse cultures, locations and circumstances. Aligning their approaches in the context of such diversity of situation and expectation has proved a challenge for organizations. The activities of Union Carbide in Bhopal, India resulted in a terrible tragedy in 1984 providing a clear example of the difficulty that businesses face in making the transition between highly regulated environments such as the US and the relatively sparse regulatory environment that prevailed in developing countries at that time. Further, businesses can find it difficult to obtain, not to mention interpret, information about their activities and their impacts in remote or distant locations. While this information problem is reducing for larger enterprises with access to newer technologies such as satellite communications, small to medium sized businesses would still have limited capacity or means to establish the impacts of their activities and decisions.

Speed. Technology change, particularly information and communications technology, has increased in pace driving a faster competitive environment.

Businesses are having to adapt more quickly to new and stronger competitors, and to find new ways of developing and retaining markets.

Awareness. Increased communication is not only affecting processes within business operations, but also the access to information for a wide range of stakeholders. Businesses, particularly multi-national enterprises, are closely tracked by resourceful stakeholders such as non-government organizations and are held to account for inconsistencies between their operations and their performance ‘claims’. Businesses used to basing their decisions on their own interpretation of their activities and their impacts have been forced to address the sometime different perspectives taken by their stakeholders. BHP found in the late 1990s that the provision of healthcare and education to communities situated close to their gold and copper mining operations in Papua New Guinea was not generally accepted by stakeholders as sufficient trade-off for the degradation of the river systems on which these communities depended for food. Improved and relatively unimpeded routes for communications have resulted in a much greater awareness of the ‘losers’ from business activities.

Faster adjustment. The process of adjustment to changed stakeholder expectations is described by Davis’ Iron Law. This law states: “when stakeholders are disadvantaged, they will eventually gather sufficient pressure by direct and indirect means to force a change in behavior”. When change occurs slowly, businesses can wait for and then respond to new regulations. Until the 1980s, most businesses operated according to the belief that regulations prescribed the limits of their appropriate behavior. Many engaged lobbyists and industry bodies to influence the development of regulations to provide some advantage, delay or relief from the effects of change. Industries such as mining, tobacco and energy provide clear examples. However, when change occurs quickly, businesses need to be in a position to canvass and pre-empt that change.

The following sections explore some of the developments and limitations of business quality approaches in greater detail.

3.3. Wave 1: Quality Improvement

During the 1970s, Western manufacturing companies realized that they were not competitive with their Japanese counterparts, in terms of cost and quality. Japanese cars began being imported into the USA, as well as consumer electronics products, and many other manufactured goods, which had quickly transformed from 'cheap and nasty' in their early days, to leading in quality and cost/ price. These consumer products were underpinned by competitive Japanese steel industries that also spawned competitive ship-building and other heavy and consumer goods industries.

The Western response was to try to copy, adapt and adopt these practices, from quality circles through to employee involvement schemes. Many and various forms of continuous improvement schemes developed and these soon became wrapped together into the euphoric phenomenon that was Total Quality Management (TQM), which swept through most Western organizations. Large amounts of money were spent on training, and change initiatives, but with very mixed success. This typically led to not just direct waste of effort and funds, but increasing scepticism amongst employee groups, managers, customers and investors, when the promise of TQM so often did not materialize. Interestingly, while most companies did not sustain major benefits from attempting TQM, there were most definitely some that did. With the benefit of hindsight, it is reasonable to conclude that the core ideas of TQM are both individually sensible and conceptually sound but that that was lacking in many organizations was connection of the TQM initiative to the central purpose and strategy of the organization, and an enduring plan of implementation that would

overcome organizational inertia such that the practices would become 'mainstreamed'.

3.4. Wave 2: Organizational Excellence

What explains variance in the success of quality and other improvement initiatives? One view is that of deeper 'organizational excellence'. This is defined as a multidimensional set of principles, properties or characteristics of organizations, including both cultural/ behavioral and systemic aspects.

People or 'Soft' Factors. So-called excellent organizations have strong connection between the purpose and values of employees and 'the company' - a shared intent. There is usually a strong degree of delegation of operational controls, while strategy is set more at the top of the company. This distinction drives a concept of 'distributed leadership' in which all employees are given and accept accountability for their performance outcomes and achievements, together with some decision-making responsibilities as to how it is achieved.

Workplace disciplines. Standard operating procedures govern the way that work is done, achieving consistency in products and services. Yet workers are trained and empowered to make sensible changes to accommodate customer requirements, and processes permit some flexibility from well established standards. In advanced companies such as Toyota, even the improvement processes are done in standard ways, not just the basic business and value adding processes. These excellent companies have a very high degree of formalization and process focus. Work processes are smooth, reliable and in control, hence capable of continuously meeting customer requirements, yet adaptable to modification and change where necessary.

Learning and information rich. Underpinning the ability to serve customers consistently well, the learning principle is strongly in place, giving workers the data, tools and ability to relate to cause with effect within their processes. These core

elements that underpin the success of the TPS and most variants of it, are presented here as universalistic ‘goods’, as intrinsic and expected to be common to all excellent organizations.

3.5. Wave 3: Building a sustainability orientation

Sustainable development practices help to create the vital link between quality and excellence approaches and organization strategy, culture, stakeholder engagement and resilience. The recent research has explored the question “Why and under what circumstances do sustainable development practices contribute to long term business success?” The research was driven by the same questions:

- Is this approach another fad, or can it deliver lasting benefits to the business?
- If this approach can deliver benefits, how and why?
- What is the optimal adoption pathway for businesses to maximize their benefits from this approach?
- What industry and organizational differences determine the preferred adoption pathway?

3.6. What are sustainable development practices?

For the purposes of this lesson, sustainable development practices are defined as: “Sustainable development practices manage technology and social organization to make balanced and equitable progress on economic, environmental and social needs so that meeting these needs in the present does not compromise the ability of future generations to meet their own needs.

The full set of activities carried out by an organization can be described as ‘practices’ – ranging from operational through strategic, short- through long-term, one-off through repeated, structured through informal, and so on. Sustainable

development practices can be viewed as part or whole of any such ‘practice’ carried out by an organization. The sustainable development practices that are described as having been successful by leading organizations share a number of characteristics that can be grouped as relating to the ‘quality’ of the practices themselves and the ‘connection’ between the practices and the strategic requirements of the organization.

Sustainable development practices that work have the following quality-related attributes:

- Deliver specific performance outcomes;
- Are part of a ‘seamless’ set of business practices;
- Are continually revised and adapted until they achieve a deep and effective contribution to their aims;
- Are ‘ahead of the game’ in terms of emerging and changing stakeholder issues; and
- Are visionary in their exposure of opportunities for the long-term and that are far-reaching.

The above list of attributes is similar to some of those measured and improved in quality and excellence frameworks, although the scope of sustainable development practices is more extensive and our research has teased out the approaches by which this extended scope can be addressed. It should also be noted that these attributes are not necessarily emphasized by many of the frameworks (actually, overlays) used to introduce sustainable development practices to organizations.

Successful sustainable development practices also contribute to the strategic requirements of the organization. Firstly and where appropriate, practices should support the position of the organization as a leader in its industry. Some industries are placed differently than others in relation to sustainable development issues. The renewable energy industry for example holds sustainability as core to its business model, whereas the mining industry engages with sustainability mainly for strategic

reasons. However, within a particular industry organizations can still use sustainability to provide them with a distinctive advantage.

Secondly, leading organizations select and modify sustainable development practices carefully to make sure they fit with the unique circumstances of the organization. For example, small companies will sensibly consider the list and nature of practices employed by large organizations, and select and adapt these practices carefully to suit their own needs. Some key differences between small and large organizations we have identified in this regard are discussed below:

- Small privately owned organizations need to satisfy their lenders (banks) whereas large publicly listed organizations have a more complex task of investor relations for their shareholders
- Small organizations have less brand exposure than large organizations
- Small organizations are often encouraged to imitate large organizations' approaches, and this denies the increased flexibility and responsiveness that is often available to smaller organizations
- One of the reasons for large organizations' use of formal systems is their need to achieve consistency across a number of locations; smaller organizations can often achieve more with simpler procedures
- Small organizations often have a short-term planning horizon in comparison to large organizations, necessitated by cash flow as well as influenced by owner attitudes
- Many large organizations have a dominant position in their industry and can therefore make changes with less risk of losing market share than would be the case for many small organizations.

Again, these differences at the industry and organizational level have parallels in the previous waves of quality and excellence – they are merely emphasized afresh in this new context of sustainability.

Thirdly, leading organizations ensure that sustainable development practices they adopt contribute to one or more of three strategic requirements, namely: stakeholder support, efficiency and market edge. One of the attributes of ‘quality’ sustainable development practices is that they should make a deep and enduring contribution to their specific outcomes or objectives. However, they should also connect to the aims and long-term success of the organization.

3.7. Bottom up? Or top down?

Discussion thus far has considered sustainability efforts in organizations at the level of individual practices. What makes these practices of high quality, and how do they link to the strategic requirements of the business? In contrast, many of the popular methods for introducing sustainability into organizations start at the top. Policy statements, company-specific objectives and commitments, organizational structures, are suggested as the appropriate starting point for new progress on sustainability. So which is the best way? Top down? Or bottom up?

For the leading organizations, the answer is ‘Both’. Each organization has a ‘mixed’ adoption pattern. Firstly, some measures had been driven from the top, and were required to meet a policy or strategic objective of the organization. Secondly, some measures were essentially ‘strategic’ in their derivation. Waste minimization efforts are a classic example of this – where efforts to reduce input costs result in major recycling or recovery and reuse initiatives. Thirdly, some measures were simply practice-driven – for example a standard industry practice such as quality control in pharmaceutical production and packaging can make a significant contribution to sustainability objectives.

3.8. Mature sustainability orientation

So far in this lesson we have discussed sustainable development practices, their connection to strategy, and their adoption pathways. What remains is to address the link between sustainable development practices and organizational culture. But did we not just say that culture (policy) was not the sole precursor for successful sustainable development practices? That's so; however our examination of leading organizations showed that 'culture' is the inevitable result of successful sustainable development practices. Leading organizations in sustainability share a set of high level practices or culture that we have called "Sustainability Orientation" and defined as: "Sustainability orientation describes the degree to which the organization culture and its set of sustainable development practices are efficient and effective both in meeting economic, environmental and social needs and in supporting the strategic direction of the business, hence providing greater opportunity for long term superior business success."

Essentially, Sustainability Orientation comprises a deep-seated set of principles that guide the organization to develop its interdependence with its stakeholders. An organization's Sustainability Orientation is strengthened by each successful implementation of sustainable development practices (i.e., practices of high quality and well connected to strategic requirements). It is the Sustainability Orientation that helps the leaders of an organization select and adapt their sustainable development practices to suit the distinctive character and strategic advantage of their business.

The principles that comprise Sustainability Orientation are: breadth of vision, stakeholder empowerment and being progressive. Breadth of vision describes the disposition of the organization to take a broad, 'big picture' view of its activities, its influence and the extent of its stakeholders. Organizations like these understand that a sustainable future for the business is intertwined with a sustainable future for its stakeholders. Stakeholder empowerment takes a more active step and in contrast to stakeholder liaison or consultation it involves the organization in sharing power and influence with its stakeholders. Organizations treat their stakeholders as a genuine

source of new ideas and value, a trusted partner, rather than treating them as a nuisance to be kept at arm's length. Being progressive embodies a commitment to organizational excellence. Just as our leading organizations demonstrated a commitment to quality in their sustainable development practices, that commitment to quality in turn supports a culture of excellence.

New insights about the factors for success in sustainable development practices do indeed suggest that a mature Sustainability Orientation may help to address some of the perceived failings of business excellence efforts. This is achieved through a stronger connection to stakeholder needs and the development of a trusted partnership between the organization and its stakeholders, built on the firm foundation of relevant, deep and effective sustainable development practices. The natural outcomes of this mature sustainability culture are: increased stakeholder engagement; increased organizational resilience in the face of uncertainty and change including changed stakeholder expectations; and a more clear and comprehensive connection between practices and their objectives and the organization's strategy and culture.

3.9. The Fourth Wave...

It is possible that we are right about the reasons behind successive waves or developments in quality approaches. What should leading organizations be preparing for and doing to stay ahead of the pack in quality?

We have suggested that Davis' Iron Law and an accelerated rate of change in stakeholder expectations has driven the previous developments in quality approaches. In that case, there are three possibilities for the future. Either Davis' Iron Law slows down again, or it stays about the same, or it speeds up even further. If Davis' Iron Law slows down, then we can expect that business and governments will seek (and obtain) greater certainty. This would result in increased restrictions on stakeholders and various forms of resistance to stakeholder power. However, given that the factors

of globalization and technology change remain unchecked leading to increased reach, speed, awareness and pace of adjustment, it would seem unlikely that Davis' Iron Law will slow down on the whole. Further, the consequences of a slowing of Davis' Iron Law, apart from some regret on behalf of less empowered and accommodated stakeholders, would not require major adjustments on the part of organizations.

Module 2.

Lesson 4. The European Excellence Model

Regardless of sector, size, structure or maturity, organizations need to establish an appropriate management system to be successful. In Europe, one of the most used models for self-assessment and strategic change is the European Foundation for Quality Management (EFQM) Excellence Model.

The EFQM Excellence Model (which is shown in figure 1) is the most widely used management framework in Europe. For example it is used by:

- more than 30,000 organizations across Europe (public and private sector),
- 60% of Europe's largest 25 companies,
- nine out of the 15 European companies in the FT's 50 World's Most Respected Companies,
- at least 10,000 Small to Medium Enterprises.

The Model serves a number of important functions for the organization. Most notably it is a:

- set of organizational beliefs or values,
- basis for thinking about, discussing and improving the organization,
- framework for analyzing an organization and benchmarking with others,
- basis for a management system,
- framework to make sense of the vast range of initiatives going on within the organization.

The Fundamental Concepts of Excellence Model. The EFQM Model is a non-prescriptive framework that recognizes there are many approaches to achieving sustainable excellence. Within this approach there are some Fundamental Concepts which underpin the EFQM Model. These are expressed below. There is no significance intended in the order of the concepts. The list is not meant to be exhaustive and they will change as excellent organizations develop and improve:

- Results Orientation
- Excellence is achieving results that delight all the organisation's stakeholders.
- Customer Focus
- Excellence is creating sustainable customer value.
- Leadership & Constancy of Purpose
- Excellence is visionary and inspirational leadership, coupled with constancy of purpose.
- Management by Processes & Facts
- Excellence is managing the organization through a set of interdependent and interrelated systems, processes and facts.
- People Development & Involvement
- Excellence is maximizing the contribution of employees through their development and involvement.
- Continuous Learning, Innovation & Improvement
- Excellence is challenging the status quo and effecting change by using learning to create innovation and improvement opportunities.
- Partnership Development
- Excellence is developing and maintaining value-adding partnerships.
- Corporate Social Responsibility

The Excellence Model is a practical tool to help organizations do this by measuring where they are on the path to Excellence; helping them understand the

gaps; and then stimulating solutions. The Model is an over-arching, non-prescriptive framework based on nine criteria. Five of these are 'Enablers' and four are 'Results'. The 'Enabler' criteria cover what an organization does. The 'Results' criteria cover what an organization achieves. 'Results' are caused by 'Enablers'.

The Model, which recognizes there are many approaches to achieving sustainable excellence in all aspects of performance, is based on the premise that *Excellent results with respect to Performance, Customers, People and Society are achieved through Leadership driving Policy and Strategy, that is delivered through People Partnerships and Resources, and Processes.*

The model is based on the following 8 fundamental concepts:

1. Results orientation,
2. Customer focus,
3. Leadership and constancy of purpose,
4. Management by processes and facts,
5. People development and involvement,
6. Continuous learning,
7. Innovation and improvement,
8. Partnership development and public responsibility.

The model consists of nine criteria (see figure 1). The first five criteria on the left are the *enabler criteria*:

1. Leadership,
2. People, Policy & Strategy,
4. Partnerships & Resources,
5. Processes.

The four criteria on the right of the enabler criteria are the *result criteria*:

6. People Results,
7. Customer Results,

8. Society,

9. Key Performance Results.

The arrows emphasize the dynamic nature of the model. They show innovation and learning helping to improve enablers that in turn lead to improved results. The Model's nine boxes, shown in Fig. 1, represent the criteria against which to assess an organization's progress towards excellence. Each of the nine criteria has a definition, which explains the high level meaning of that criterion.

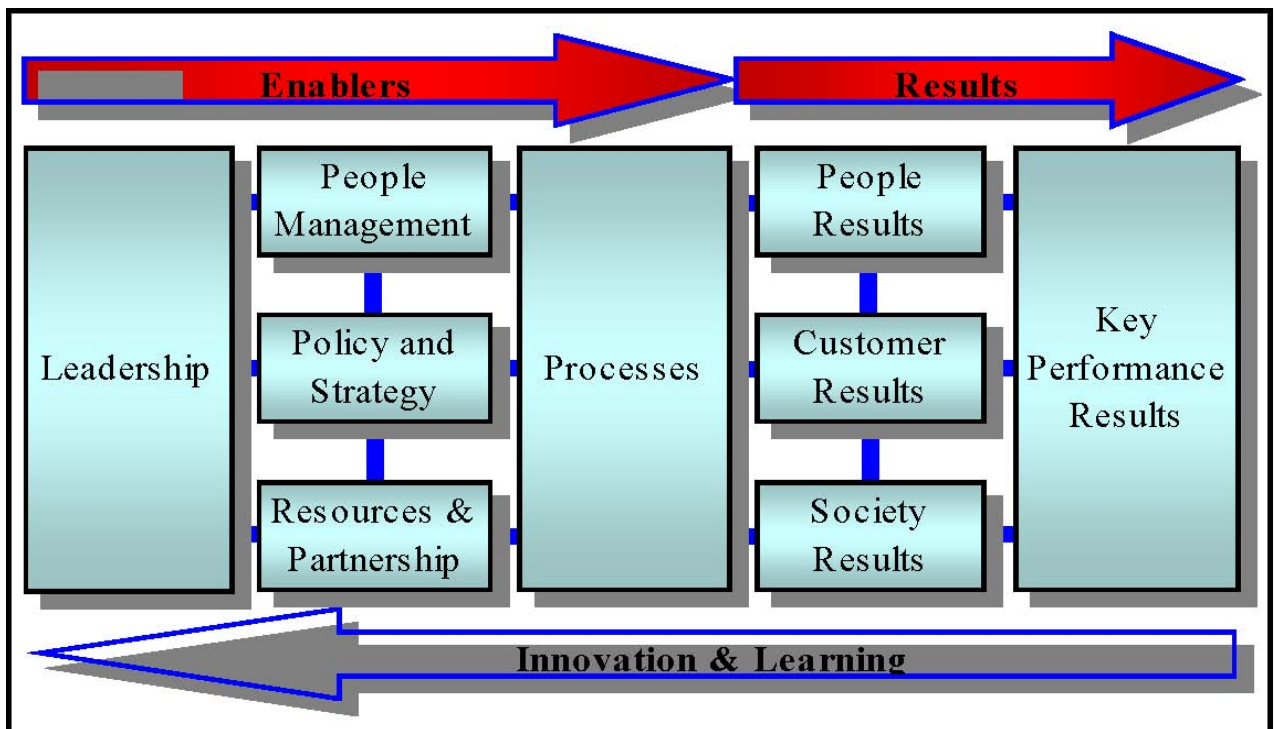


Figure 1: European Excellence Model

To develop the high level meaning further each criterion is supported by a number of sub-criteria. Sub-criteria pose a number of questions that should be considered in the course of an assessment. Below each sub-criterion are lists of possible areas to address. The areas to address are not mandatory nor are they exhaustive lists but are intended to further exemplify the meaning of the sub-criterion.

1. Leadership. Excellent Leaders develop and facilitate the achievement of the mission and vision. They develop organizational values and systems required for sustainable success and implement these via their actions and behaviors. During

periods of change they retain a constancy of purpose. Where required, such leaders are able to change the direction of the organization and inspire others to follow.

1a. Leaders develop the mission, vision, values and ethics and are role models of a culture of Excellence.

1b. Leaders are personally involved in ensuring the organization's management system is developed, implemented and continuously improved.

1c. Leaders interact with customers, partners and representatives of society.

1d. Leaders reinforce a culture of excellence with organization's people.

1e. Leaders identify and champion organizational change.

2. Policy & Strategy. Excellent Organizations implement their mission and vision by developing a stakeholder focused strategy that takes account of the market and sector in which it operates. Policies, plans, objectives, and processes are developed and deployed to deliver the strategy.

2a. Policy and Strategy are based on the present and future needs and expectations of stakeholders.

2b. Policy and Strategy are based on information from performance measurement, research, learning and external related activities.

2c. Policy and Strategy are developed, reviewed and updated.

2d. Policy and Strategy are communicated and deployed through a framework of key processes.

3. People. Excellent organizations manage, develop and release the full potential of their people at an individual, team-based and organizational level. They promote fairness and equality and involve and empower their people. They care for, communicate, reward and recognize, in a way that motivates staff and builds commitment to using their skills and knowledge for the benefit of the organization.

3a. People resources are planned, managed and improved.

3b. People's knowledge and competencies are identified, developed and sustained.

3c. People are involved and empowered.

3d. People and the organization have a dialogue.

3e. People are rewarded, recognized and cared for.

4. Partnerships & Resources. Excellent organizations plan and manage external partnerships, suppliers and internal resources in order to support policy and strategy and the effective operation of processes. During planning and whilst managing partnerships and resources they balance the current and future needs of the organization, the community and the environment.

4a. External partnerships are managed.

4b. Finances are managed.

4c. Buildings, equipment and materials are managed.

4d. Technology is managed.

4e. Information and knowledge are managed.

5. Processes. Excellent organizations design, manage and improve processes in order to fully satisfy, and generate increasing value for, customers and other stakeholders.

5a. Processes are systematically designed and managed.

5b. Processes are improved, as needed, using innovation in order to fully satisfy and generate increasing value for customers and other stakeholders.

5c. Products and Services are designed and developed based on customer needs and expectations.

5d. Products and Services are produced, delivered and serviced.

5e. Customer relationships are managed and enhanced.

6. Customer Results. Excellence organizations comprehensively measure and achieve outstanding results with respect to their customers. It means that they take:

6a. Perception Measures.

6b. Performance Indicators.

7. People Results. Excellent organizations comprehensively measure and achieve outstanding results with respect to their people which means:

7a. Perception Measures.

7b. Performance Indicators.

8. Society Results. Excellent organizations comprehensively measure and achieve outstanding results with respect to society. For this purpose they use:

8a. Perception Measures.

8b. Performance Indicators.

9. Key Performance Results. The measures are key results defined by the organization and agreed in their policy and strategies. It includes:

9a. Key Performance Outcomes.

9b. Key Performance Indicators.

The European Foundation for Quality Management (EFQM) stresses that an assumption behind the model is that the results of the organization are achieved through excellent performance in the enabler criteria. An organization achieving excellence in the enablers will experience sustainable developments through improved customer, people, society and financial results. That sounds logical and easy, but reality or practice is not always that easy. There is among others no consensus on how to start up and how to continue with the implementation of the EFQM Excellence model.

One of the reasons behind these problems is maybe that the self-assessment approach suggested by consultants or other experts trained as EFQM assessors is often an award based approach even if the companies need quite a different approach. In most cases companies do not aim to receive a quality award, but rather need to initiate and carry out sustainable quality improvements. In these cases the strategic intent of the company will determine what is most important in the self-assessment process, and the standard weights of the model's criteria suggested by EFQM are meaningless and misleading. Furthermore the model generally pays little attention to contextual factors. The right approach for implementation varies depending on the current maturity level of the company and existing organizational culture.

Another problem is linked to the management paradigm. Although it is stressed by EFQM that the model is based on 8 fundamental concepts, the actual approach will vary depending on the interpretation and understanding of the model, and the existing management paradigm often determines the character and direction of the interpretation. For instance, if the existing and dominant management paradigm is a rational and measurement oriented one, the model will be interpreted favoring those aspects, while other aspects such as people and culture which are rather irrational and intangible aspects will be more or less undermined or ignored. In fact in most quality literature those irrational aspects of conflicts, power issues as well as peoples' political interests are either ignored or unseen and remain as untouched areas.

A Strategy for Building Sustainable Innovation Excellence. We will now turn to the development of a methodology and an associated measurement instrument for diagnosing innovation excellence. The conceptual model behind the measurement instrument has been developed based on the specific enabler criteria and criteria parts from the European Excellence Model adapted to the innovation area. The areas to address (= the key performance indicators) under each criterion is the result of a comprehensive study of innovation literature combined with the case company's experiences from a relatively new established technology center.

By *sustainable innovation excellence* we mean that innovative new products or services are developed in a way which both in the short term and in the long run satisfies the customers and other stakeholders, such as employees, suppliers and society, in a balanced way. Hence it is obvious that the basis for developing new innovative products is a *customer culture*, which starts with the identification of the potential customers' problems and needs and ends with customer satisfaction and loyalty. Everyone involved in innovation should have an open, constructive, positive attitude towards its customers and make sure to understand customers' needs and problems.

Regarding the influence of people on the innovation process and hence on

innovation results this aspect is supported by several studies. We believe that one of the primary tasks in the future for leaders and its people will be to integrate creativity and learning in the innovation processes, and motivate and manage knowledge, learning and creativity in relation to its people. *Learning* helps to increase the capacity of a person's creativity. *Creativity*, on the other hand, is the foundation for building a learning organization, and is the underlying driver behind all improvements and innovation. To have success with that integration leadership is needed at the top level as well as at the department levels and at the team level. That is the reason why we have integrated the sub factor *Innovativeness* under the leadership factor.

It is a management responsibility – top management as well as middle management – to build an innovative culture, with norms and values, which supports innovation and new product development. Such a culture is the result of intentional long term activities. It is the result of careful thinking, reflection, planning, measurements and follow-up from top level to process level. The plans for building the right innovative culture should be a part of the yearly strategic planning and follow up process (*Strategies and Plans*) where the deployment process follows the *Hoshin Planning* methodology

One difference from the model in figure 2 and the European Excellence Model is that the model in figure 1 only has one result factor – *innovation results*. The reduction of the results criteria was done partly in order to simplify the model but also to assure flexibility.

The types of results to be included under innovation results should always be flexible and be related to the context and the company's strategic goals which should be determined by balancing the different stakeholders' needs and interests. Hence the concept of *sustainability* should be used here in order to assure both long term and short term customer and other stakeholders' satisfaction meaning that the company in its new product development activities is building Sustainable Innovation Excellence.

Another difference from the European Excellence Model is that the leadership

factor has been split into 2 enabling sub-factors. Building a culture of *innovativeness* and *customer orientation*, which is part of the leadership criterion in the EFQM Model, is so crucial for innovation success that we decided to separate these sub-criteria from the general leadership criterion to become new enabler criteria. Hence we have increased the enabler criteria compared with the EFQM excellence model from 5 to 7.

According to the model in figure 2 six factors are driving the innovation process. As *strategies and plans*, together with *innovativeness* and *customer orientation*, also may be regarded as belonging to the leadership factors a simple version of the model's enabler side is "the 4P" model's enablers: 1) Leadership, 2) People, 3) Partnership and 4) Processes

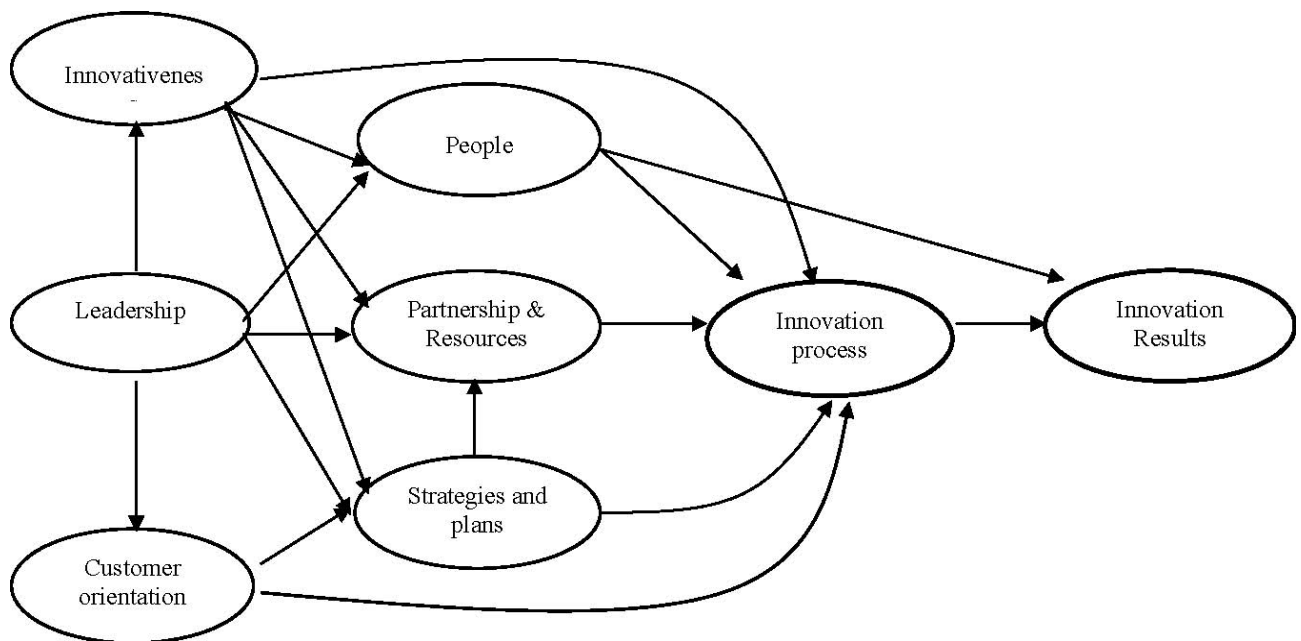


Figure 2. A Conceptual model for measuring Innovation Excellence

A People Oriented Quality Strategy for Building Sustainable Organizational Excellence (OE). As there is an increasing recognition of employees as organizations' greatest asset, there seems to be a need to develop a people oriented quality strategy or model to be used as a guideline for strategic planning,

implementation, measurement and follow up when companies are trying to build OE. Such a model should clearly signal that the first step in building organizational excellence is to build quality into people, and that “the people first policy” and “total development of people” are essentials for achieving organizational excellence.

The quality strategy should always be implemented multidirectional, i.e. through a top-down, middle-up-down and a bottom-up strategy. The strategy should follow the Policy Deployment approach. Such an approach provides a framework for building quality into the following three levels: 1) Individual level, 2) Team level and 3) Organizational level. Figure 3 below illustrates these interrelationships and the process of building these different levels. Building OE starts with *building Leadership*, which means developing (educating/ training) and/or recruiting leaders with the right values and competencies. The next step is to develop and/or recruit *People* with the right values and competencies. Especially on the value dimension leaders’ behaviors determine if core values (as for example trust, respect, openness etc.) will be diffused and will become a part of the organizational culture. *Building Partnership/Teams* means that teams are established and developed and each team is able to practice the right and needed values and competencies, and *Partnership* is established in all people relationships - within the team, between team members, between teams and with other people or groups outside the team (suppliers, lead customers etc.). *Building Processes* means that leaders, individuals and teams day by day try to practice the needed values and competencies based on the principle of continuous improvement and the company’s mission, vision, goals and strategies. *Building Products/Services* means building quality into tangible and intangible products/services through a constant focus on customers’ needs and market potentials, and to practice the principles of continuous improvement parallel with innovativeness in new product development. The foundation (building leadership) supports the four other factors represented by “the 4P” and all together the 5 factors comprise a roadmap to the “result” called *Organizational Excellence*.

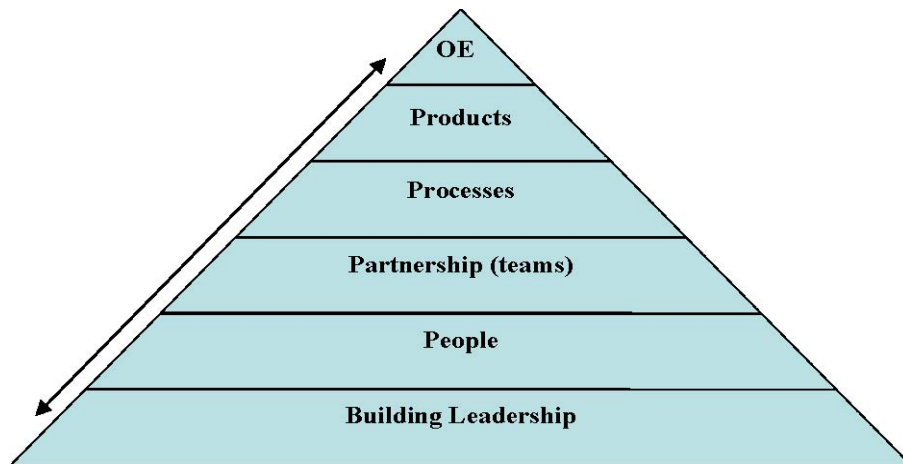


Figure 3: Building Organizational Excellence (OE) through Leadership and “the 4P”

By combining figure 2 and figure 3 the “4P” model can also be presented as shown in figure 4 below.

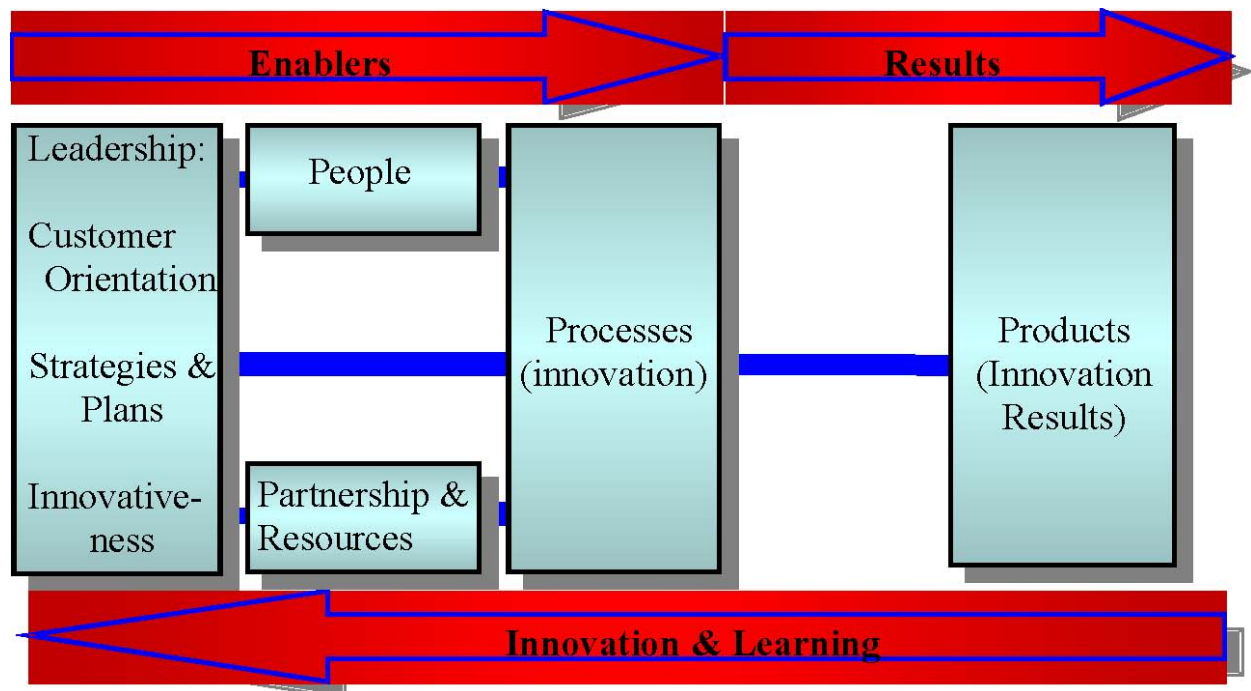


Figure 7: The “4P” Excellence Model to be adapted for Innovation and New Product Development

Lesson 5. Business Improvement using the EFQM Model. Step 1.

5.1. Introduction

The fundamental concepts of the EFQM Model were described in the previous lesson. The key question now is “How does the Model help drive the business improvement?”

This is achieved through the application of the RADAR philosophy which is the heart of the EFQM Model. It consists of four elements:

- Determine **Results** required (**R**),
- Plan and develop an integrated set of **Approaches** (**A**),
- **Deploy** the approaches (**D**),
- **Assess** and **review** approaches and their deployment (**AR**).

In other words, the philosophy is that an organization needs to:

- Determine the **Results** it is aiming for from its Policy and Strategy,
- Plan and develop an integrated set of **Approaches**,
- Deploy the **Approaches**, then
- Assess and Review these approaches to identify, prioritize, plan and implement improvements.

The Business Excellence Model has nine criteria that are broken down into two main groups – enablers and results. This breakdown provides a way to classify the organization’s activities and performance.

The theme of innovation and learning spins the Model and reinforces the feedback mechanisms that drive the improvement in the organization’s performance. We will start by describing a sample change process. It has four key steps based around the RADAR (Results, Approach, Deployment, Assessment and Review) approach.

5.2. A Sample Change Process using RADAR

RADAR is based on the widely known “Plan – Do – Check – Act” continuous improvement cycle. The concept is:

- **Plan** what you need to do to achieve your organization’s goals,
- **Do** the action/activity,
- **Check** or review that the action/activity was successful,
- **Act** on the results of the review, for example, by taking additional actions if you were not completely successful.

The improvement approach described will need to take the following steps:

- 1) Consider where there is a need for improvement based on the results in your organization aims to achieve. These may concern People, Customers, Partners, Society and Key Performance Results. **Establish and prioritize the improvement needs – the Results being aimed for.**
- 2) Decide what approaches need to be implemented or improved in order to achieve the aims. Things are never simple and there is always a variety of options that you may take. **Select the improvement activity – the Approaches to be introduced or improved.** This is the key part of this step.
- 3) Deploy the approaches at an appropriate level in the organization. **Take action – deploy the new or revised approaches.** This is often more than just communicating the change and usually involves a change to procedures and behaviors. Change can also be introduced in a managed way that is culturally acceptable to increase the chances for success.
- 4) **Assess and review** the benefit of the change to ensure that the approaches have been effective. **Confirm the improvement – Assessment and Review.** The success of this step will depend on how well the change was planned and managed.

5.3. Step 1. Establish and prioritize the improvement needs – the Results being aimed for

Whoever gave the advice “State destination before boarding the train” must have had experience of racing off to take action before understanding exactly what the purpose of the action was.

Another trap is to plan to take too much action, which often leads to no action being taken at all. All organizations have limited resources, be these financial and/or human, etc. Therefore it is important to choose to take actions where there is going to be the greatest payback against the chosen objectives. Even if you think you know what needs to be done this is often based on perception and not fact.

The first stage of the improvement process, therefore, is to analyze the current situation and clearly state your aims. Many methods can be used for this analysis. Organizations that are familiar with the Excellence Model may already be practicing “self-assessment” leading to an abundance of improvement opportunities. Additionally, you can get an insight from other activities. As part of an organization’s strategic planning activities it may perform regular SWOT analysis that include a review of the organization’s current strength and weakness as well as a check on the opportunities and threats. Another source could be specific feedback from a stakeholder, such as a customer, or from the results of a benchmarking exercise.

When discussing analysis a key message is that “you get what you pay for”. An organization that seeks detailed data on which to make decisions is likely to make better decisions than the one that makes decisions just on perceptions or, as is often the case, “gut feel”. Care should be taken to avoid “analysis paralysis”, however, as things can be taken too far.

It is important to choose an approach for the analysis that suits the situation. There are many ways of conducting self-assessments against the Excellence Model, including such diverse techniques as a group of managers sitting in a room for a couple of hours to get their view on where they perceive there are gaps, or conducting

an “award” style self-assessment lasting several months that involves collecting lots of data. Both methods are suitable in different situations depending on the purpose of the exercise, which can also be diverse.

The analysis, whichever way it is done, should lead to the point where you may answer several questions. Every organization will have their own set of questions, but they are likely to include the following:

1. What are the most important over-driving issues that the organization has to address?
2. Which stakeholders are these issues affecting in a positive way?
3. Are there any stakeholders who will lose out?
4. What is the current performance in this area?
5. By how much must current performance improve to meet targets?
6. What will it take in terms of resource to achieve this level of performance, and can the organization afford it?

From this list of questions it should be possible to select the priority actions. It should also be possible to screen out any improvements that are outside the organization’s current capabilities, be these market requirements, financial resource requirements, human resource availability or skill availability.

Lesson 6. Business Improvement using the EFQM Model. Step 2.

6.1. Introduction

We now move to the Step 2: Select the improvement activity. In other words we are now to select which Approaches are to be introduced or improved.

It is vital that senior managers are on board at this stage to ensure you have their support for all future actions, as any improvement activities are more likely to occur and be successful if the leaders support them. Therefore, ensure you

communicate with your senior managers and educate them at all stages of the improvement process.

Rarely it is possible to say “Yes, that is the action we must take”. In business things are complicated and there are several options that may be followed. From all the alternatives, it is necessary to choose an option that best suits the results required. This objective should be positive and SMART (Specific, Measurable, Achievable, Realistic and Timely). The following activities may help:

1. Generate options of improvement actions that could be taken.
2. Select the option that describes what is actually going to be done.
3. Define the actual approach or approaches that are to be introduced or improved.

At this stage no consideration is given to how the implementation of the action will be managed, as this is the focus of the next step. You simply concentrate on what needs to be done to achieve the performance that was defined in the first step in terms of the approaches that have to be introduced or improved.

6.2. Option generation – what could be done?

So far all you have is an objective to improve the organization’s performance, but do not know how this will be achieved. Here we can turn to the Excellence Model to generate some options detailing what could be done to reach the required level of performance. However, first we need to come back and talk a bit more about the Excellence Model.

People manage the organization’s processes that deliver the level of performance. It follows that, if the performance is not at the level required, you can look at either the process, the way that people are being managed and developed, or a combination of both to find opportunities for improvement. Understanding these linkages turns the Excellence Model into a powerful diagnostic tool. The elements of the Model show how the drive for Excellence is measured and supported.

The enabler criteria of the Excellence Model are concerned with how the organization approaches Excellence:

- **Leadership.** It shows how the leaders develop and facilitate the achievement of the Mission and Vision, develop values required for long-term success and implement these via appropriate actions and behaviors, and are personally involved in ensuring the organization's management system is developed and implemented. This criterion falls into four sub-criteria:
 - Leaders develop the Mission, Vision and values, and are role models of a culture of excellence.
 - Leaders are personally involved in ensuring the organization's management system is developed, implemented and continuously improved.
 - Leaders are involved with customers, partners and representatives of society.
 - Leaders motivate, support and recognize the organization's people.
- **Policy and Strategy.** It shows how the organization implements its Mission and Vision via a clear stakeholder-focused Strategy, supported by relevant policies, plans, objectives, targets and processes. This criterion falls into five sub-criteria:
 - Policy and Strategy are based on the present and future needs and expectations of stakeholders.
 - Policy and Strategy are based on information from performance measurement, research, learning and creativity related activities.
 - Policy and Strategy are deployed through a framework of key processes.
 - Policy and Strategy are communicated and implemented.
- **People.** This criterion shows how the organization manages, develops and releases the full potential of its people at an individual, team-based and organization-wide level, and plans these activities in order to support its Policy

and Strategy and the effective operation of its processes. This criterion also falls into five sub-criteria:

- People resource are planned, managed and improved.
- People's knowledge and competences are identified, developed and sustained.
- People are involved and empowered.
- People and the organization have a dialogue.
- People are rewarded, recognized and cared for.

- **Partnership and Resources.** It shows how the organization plans and manages its external partnerships and internal resources in order to support its Policy and Strategy and the effective operation of its processes. The criterion includes five sub-criteria:

- External partnerships are managed.
- Finances are managed.
- Buildings, equipment and materials are managed.
- Technology is managed.
- Information and knowledge are managed.

- **Processes.** The criterion shows how the organization designs, manages and improves its processes in order to support its Policy and Strategy and fully satisfy, and generate increasing value for, its customers and other stakeholders. The criterion also includes five sub-criteria:

- Processes are systematically designed and managed.
- Processes are improved, as needed, using innovation in order to fully satisfy and generate increasing value for customers and other stakeholders.
- Products and services are designed and developed based on customer needs and expectations.
- Products and services are produced, delivered and serviced.
- Customer relationships are managed and enhanced.

The results criteria of the Excellence Model are concerned with what the organization has achieved and is achieving:

- **Customer Results.** It shows how the organization is achieving in relation to its external customers. The criterion includes two sub-criteria:
 - Perception measures: overall image, products and services, sales and after-sales support, loyalty.
 - Performance indicators: overall image, products and services, sales and after-sales support, loyalty.
- **People Results.** This criterion shows what the organization is achieving in relation to its people. The criterion includes the following sub-criteria:
 - Perception measures: motivation, satisfaction.
 - Performance indicators: achievements, motivation and involvement, satisfaction, services provided to the organization's people.
- **Society Results.** What the organization is achieving in relation to local, national and international society as appropriate. This criterion also includes two sub-criteria:
 - Perception measures: performance as a responsible citizen, involvement in the communities where it operates, activities to reduce and prevent nuisance and harm from its operations and/or throughout the life cycle of its products, reporting on activities to assist in the preservation and sustainability of resources.
 - Performance indicators: handling changes in employment levels, press coverage, dealings with authorities, accolades and awards received.
- **Key Performance Results.** What the organization is achieving in relation to its planned performance. The criterion includes two sub-criteria:

- Key performance outcomes (lag): financial (share price, dividends, gross margin, net profit, sales, meeting of budgets) and non-financial (market share, time to market, volumes, success rates).
- Key Performance indicators (lead): processes, external resources including partnership, financial buildings, equipment and materials, technology, information and knowledge.

As we could see, beneath the nine criteria of the Model is a framework of 32 criterion parts or sub-criteria, which collectively provide a more detailed description of the Model. Each criterion part poses a question to stimulate thinking. For example from the Leadership criteria are questions focused on how leaders develop the mission, vision, values and ethics and how they are role models for a culture of excellence.

The full power of the Excellence Model is realized from the linkages between results and enablers. An understanding of the linkages across the Model allows us to identify potential areas for improvement. These linkages may be found at two levels:

1) The first level is across the Model itself between the results and enablers, e.g. if there is a need to improve the People Results the key question is where to look for the approaches that could be improved. As an illustration of this we will consider the linkages between the Customer Results and the Enablers.

The Customer Results are linked to five other criteria (Leadership, Policy and Strategy, People, Partnerships and Resources, and Processes):

- **Leadership** is linked to (depends on) the *Leader's involvement with customers*.
- **Policy and Strategy** is linked to *Establishing customer's needs and expectations* and *Balancing customer's needs and expectations*.
- **People** is linked to *People have the skills and competences to deal with customers* and *People's involvement with customers*.
- **Partnership and Resources** is linked to *Good supplier/partner relationships to satisfy customers*.

- **Processes** is linked to *Improving processes to satisfy customers, Product and service development, Product and service delivery and Customer relationship management.*

2) The second level of linkages is within each criterion, e.g. for Policy and Strategy the sub-criteria follow the logical sequence, and identifying which part of the chain may be weak leads to ideas for improvement.

If we want to increase customer satisfaction, we may have identified that your staff is not customer focused, and further investigation may reveal that this is not the issue that training alone will solve. Part of the cause may be the lack of direction or perhaps an inappropriate strategy. The key point here is that we want to open up as many opportunities as possible before deciding what to do.

Module 3.

Lesson 7. The XEROX Business Excellence Model

In the early 1960's The Rank Xerox company developed a product, the photocopying machine, which became a real milk cow. The company entered the Fortune 500 in 1962 as No 423 and worked its way up to No 70 in 1970. The result of this rising was, however, that the company fell asleep. Much money was lost on adventures outside the core business, and the control of vital functions such as product development and production were lost. Furthermore, the company forgot to keep an eye on the competitors. The company lost market shares when the world patents expired and especially the Japanese competitors were really cost competitive when they entered the world markets offering new products at prices less than the production costs of the existing Xerox products. The company was near to bankruptcy.

However, Xerox did not give up and Mr. David Kearns, the managing director, said: *"We are determined to change significantly the way we have been doing*

business”. By using Benchmarking and later on a well designed self-assessment process Xerox became very successful during the following about 15 years.

During these survival years Xerox first learned from W. E. Deming, P. Crosby, the Japanese Quality Award framework (the Deming Prize), and later on from the Malcolm Baldrige Quality Award Model. Xerox became recognized for its *Leadership through Quality* program and the success with application for several quality awards. Hence it seems to be a good idea to look at what were the main characteristics of the business excellence model used by Xerox in that period.

Xerox related Business Excellence to certification (1994) as they defined *excellence* as *being certified with a high score* on the following *six excellence criteria*:

1. Management Leadership,
2. Human Resource Management,
3. Business Process Management,
4. Customer and Market Focus,
5. Information Utilization and Quality Tools,
6. Business Results

The excellence criteria 1-5 were called *enablers*. The sub-criteria of the six excellence criteria can be seen in figure 1 below which shows the details of the so-called Xerox Management Model (XMM). The XMM model was introduced in Xerox as *A Mechanism for Integrating Quality into the Daily Business Operations*.

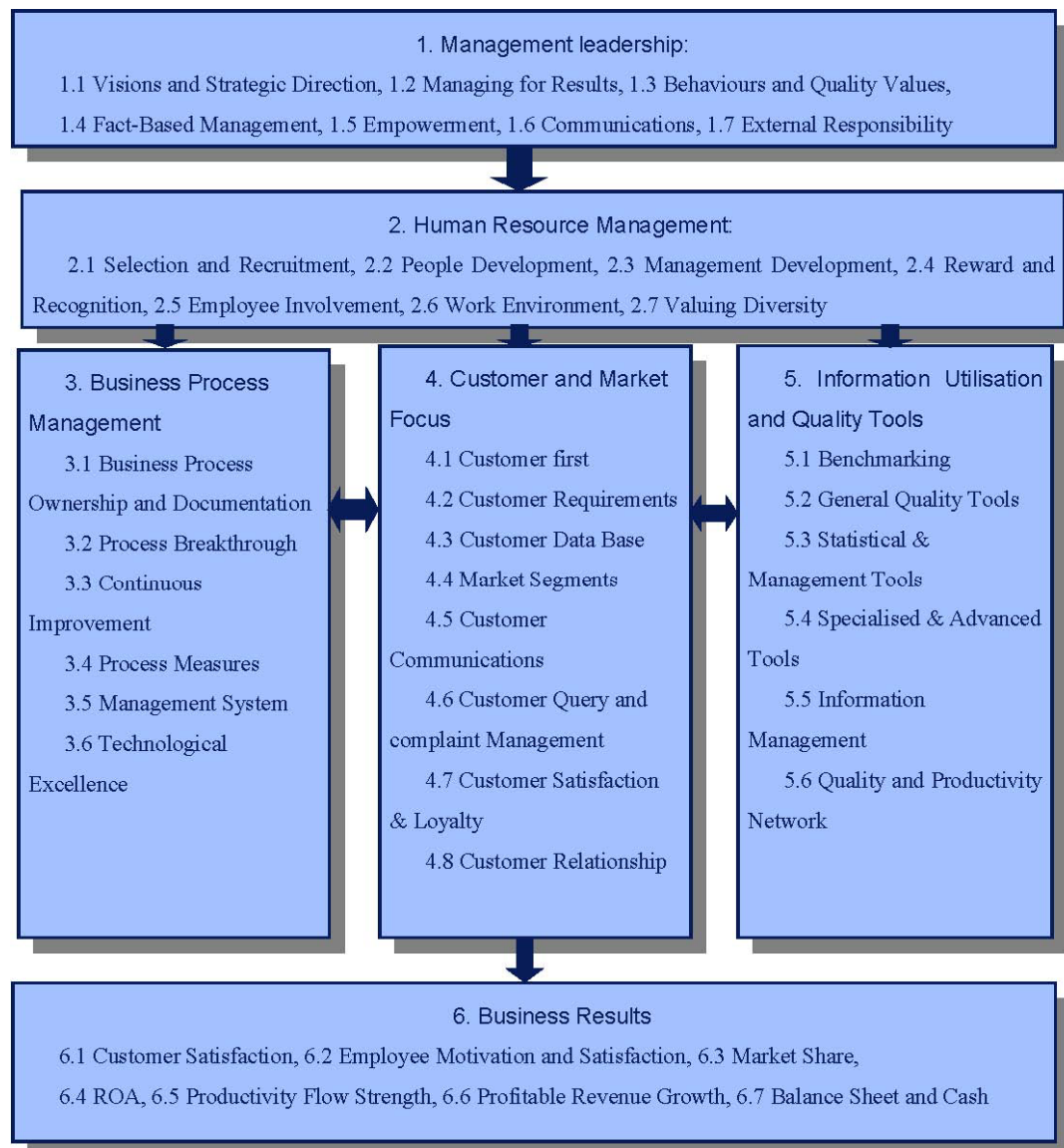


Figure 1: The Structure and Criteria of the Xerox Excellence Model (1990)

The *Business Results* sub-criteria were measured every month, and the *enablers* were measured by self-assessment every 3 months. The results of self-assessment were input to:

- 1) the quarterly review and correction process,
- 2) the yearly strategic planning process.

The Xerox Business Excellence Model became a mirror of how Xerox was managed, and a holistic diagnosing tool for sustaining Business Excellence. The process of certification, where top managers from other Xerox companies were

external assessors, proved to be very effective in spreading best practices within the whole corporation.

By comparing The Xerox Business Excellence Model with simplified excellence model we find both similarities and differences. The criteria 1, 2, 4 and 6 seem to cover very well the model of the most critical success criteria for excellence. The criteria 4 and 6 - *Business Process Management* and *Information Utilization and Quality Tools* – do not seem on the surface to be included in the model. The reason may be that those two criteria are based on sub-criterion 1.4 under Leadership – *Fact-Based Management* – and other researchers did not seem to pay too much attention to measurements.

In fact, fact-based management is necessary when balancing the *Hardware* and *Software Factors* in the *7S Model* shown in the introduction (see Lesson 2). But we also agree with the findings that focusing too much on tools and measurements, which are important in the criteria 4 and 6 in Xerox Business Excellence Model, can have a negative effect on the software factors, which are highlighted in the simplified excellence model. We agree that the four software factors included in the simplified model are among the most important success criteria for excellence because they are often pre-requisites for successful fact-based management.

When we look at criterion 6, Business Results, it is important to know that the sub criteria have been ranked in order of bonus importance. Top managers' bonuses were dependent on how well the business results were achieved and 6.1 Customer Satisfaction, and 6.2 Employee Motivation and Satisfaction had higher weights than 6.3 ROA (Return on Assets) and 6.4 Market share. This ranking seems well in accordance with the simplified Excellence model. It seems as if Xerox, with the Xerox Business Excellence Model, had developed a reasonable business excellence model which tried to balance hardware and software factors when running its business.

The Xerox quality program called *Leadership through Quality* was not a static one,

but it became continuously improved during the 90's. In the late 90's, Six Sigma and Lean were adopted locally by Xerox's supply chain and manufacturing operations, and finally in 2002, it was integrated across the corporation by committing the resources required to enable a robust deployment.

The name of the Xerox quality program is now *Xerox Lean Six Sigma Quality*. Customer focus is at the heart of Xerox Lean Six Sigma framework (fig. 2). The outer ring sends the message that:

1) People providing and 2) Customer Value leads to improved 3) Business Results.

The four components surrounding the customer focus circle signal what people must do in order to improve customer value and business results. *Benchmarking and Market Trends* provide the best practices for setting performance targets and finding better ways to improve processes, while the *DMAIC process* (Define-Measure-Analyze-Improve-Control) provides the roadmap, principles and tools for process improvements. The *Xerox Performance Excellence Process* supports the alignment of strategies and performance objectives, and the *Leadership* component is critical in supporting all components of the framework.

By comparing the Xerox Business Excellence Model from the early 90's and the Xerox Lean Sigma framework from 2002 we find that the former model focused on what had to be measured, and the Xerox Six Sigma framework communicates what are the guiding principles and practices for staying in business and achieving excellent performance. We find this simplification natural and important seen from a communication point of view.

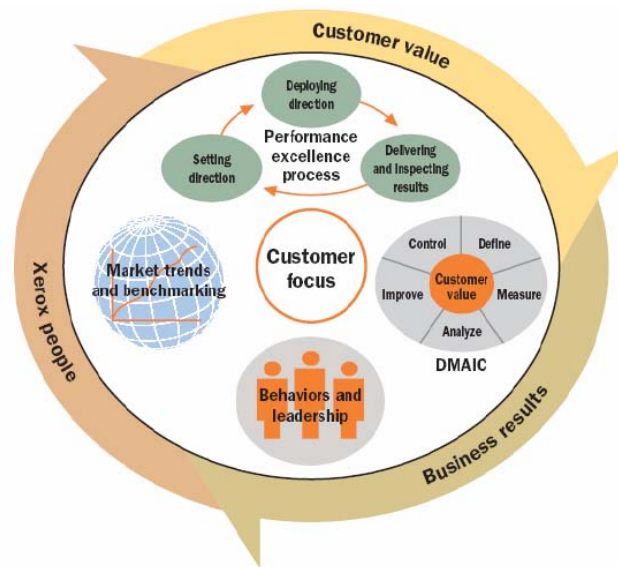


Figure 2. Xerox Lean Six Sigma Framework

The message highlighted in the outer ring is the *People First* message, which became more and more common and accepted during the 90's as being one of the most important principles of excellence. This principle was easy to support orally but not so easy to practice. Xerox revised excellence model may have come up because of problems with real people involvement/ empowerment.

By comparing the revised excellence model in figure 2 with the simplified model we find both similarities and differences. The similarities are related to the overall messages of the two models, which are almost identical. The differences are related to the details which have been taken away in the simplified model. The arguments for their simplification are shown here at the end of this section because these arguments may also partly be used for understanding the necessary simplification of Xerox Business Excellence Model:

Lesson 8. The “4P Model” for Building Organizational Excellence

One important motivation behind the “4P” model has been to create a model that

provides an integrated approach between various, and often conflicting aspects, such as soft (intangible) and hard (tangible) aspects, subjective and objective aspects, rational and irrational aspects, individual/personal and collective/organizational aspects etc. Existing models have often been misinterpreted and the result has been organizational prioritizing on certain aspects while other equally important aspects are unseen and/or ignored. Among others the human aspect has been one of the most underestimated aspects. Thus, with these considerations in mind, there arose a need to construct an alternative more people oriented model of organizational excellence. The result became the “4P” model in which the people dimension is recognized and emphasized along with other critical excellence variables. According to the model, building excellence into the following 4P develops Organizational Excellence (OE): 1. People, 2. Partnership, 3. Processes, 4. Products.

The “4P” model is suggested based on the recent awareness on human resources and their role in an organizational context as one of the most critical issues for any organizational improvement activities. From this viewpoint it is argued that the first priority of any quality or excellence strategy should be to build quality into people as the essential foundation and catalyst for improving partnerships, processes and products.

The quality strategy should preferably be implemented multi directional, i.e. through a top-down, middle-up-down and a bottom-up strategy. The strategy should follow the Policy Deployment approach, which has both the top-down and the bottom-up strategy included. Such an approach provides a framework for building quality into the following three levels: a) Individual level, b) Team level and c) Organizational level.

Figure 1 below indicates that building Organizational Excellence is initiated by building *Leadership*, which means recruiting leaders with the right values and competencies and developing leaders through education and training so that proper leadership is practiced. Leadership impacts throughout organizations are huge. For

instance, leaders' behaviors will largely determine if core values (as for example trust, respect, openness etc.) will be diffused and will become a part of the organizational culture.

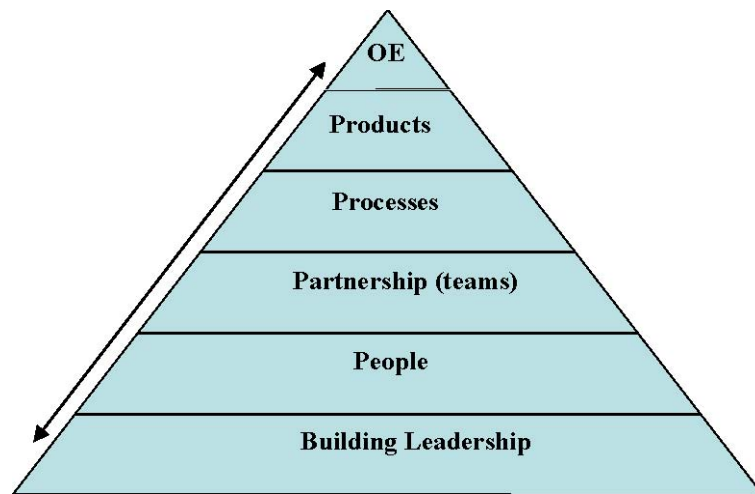


Figure 1: The “4P” Model for Building Organizational Excellence

The next level is *People*, which involves recruitment of ‘the right people’, training and education with the right values and competencies. Education and training of employees is essential for giving people understanding of the company’s philosophy and values as well as the competencies (skills and know-how) needed for performing their job. Working on the people level also includes intangible aspects of individual persons’ mental processes such as perceptions, thoughts, intentions, beliefs, motives, willingness, desires, self-motivation etc along with more tangible aspects of behavior and patterns of interaction with others.

Building *Partnership / Teams* means that teams are established and developed, so that each team is able to practice the right and needed values and competencies in their daily activities. *Partnership* is established in all people relationships -within the team, between team members (intra-team), between teams (inter-team) and with other people or groups outside the team. Partnership also includes external stakeholders such as suppliers, customers, society and community stakeholders.

Building *Processes* means that leaders, individuals and teams day-by-day try to

practice the needed values and competencies based on the principle of continuous improvement and *speed* is continuously improved and at the same time *costs* are reduced through improved people relationships in the system. The strategy, for simultaneously improving quality and speed and reducing costs, is to identify and reduce waste everywhere in the supply-chain processes from suppliers to the customers. Here the overlapping principles, tools and methods of TQM, Lean Thinking and the Six Sigma Quality methodology are used.

Building *Products* means building quality into tangible and intangible products/services through a constant focus on customers' needs and market potentials, and to practice the principles of continuous improvement parallel with innovativeness in new product development.

The foundation (building leadership) supports the four other factors represented by "the 4P" and all together the 5 factors comprise a roadmap to the "result", which is called *Organizational Excellence*. It is assumed by the model, that all 5 factors are necessary for achieving organizational excellence.

One of the basic assumptions behind *the "4P" model* is the principles of open systems theory that recognizes the importance of interrelationships, processes, contingency and integrative aspects between various parts of a system. Although we recognize the decisive role of leadership in shaping the vision, mission and organizational culture, the influence and interaction aspects of all levels and subcultures should not be underestimated. The above mentioned multidirectional approaches of *the "4P" Model* are based on this view.

Seen from this perspective all activities and interactions are information exchange activities, which organizations try to utilize in order to not only maintain their existing standards and processes, but also to improve and change. We emphasize that *the "4P" Model* should be viewed as an integrative model where the distinctions between subjective/mental and objective/physical as well as between micro/individual and macro/collective aspects of reality are abandoned. As can be seen in Table 1 below

the various elements of *the “4P” Model* can be interpreted as parts of the dynamic continuum between the micro-macro and the subjective-objective pole of organizational realities. The micro/individual – macro/collective continuum is shown vertically and the subjective/intangible – objective/tangible continuum is shown horizontally.

Table 1: The “4P” and the four aspects of organizational realities

	Subjective/ intangible	Objective/ tangible
Micro/ Individual	Individual feelings, perceptions, assumptions, values, thoughts, intentions and will, beliefs, motives, meaning creations, desires, motivation, commitment, loyalty (<i>Building Leadership, Building People, Building Partnership</i>)	Individuals’ patterns of behaviour Leadership behaviour and patterns, Patterns of interactions Patterns of partnership Individual work processes Individual work performance (<i>Building Leadership, Building People, Building Partnership, Building processes</i>)
Macro/ Collective	Groups, departmental and organizational norms, values, political interest, power relationships, informal power structure, conflicts, interpersonal-, inter group meaning creations(<i>Building Leadership, Building People, Building Partnership</i>)	Vision, mission statement, Symbols, Ceremony, Traditions, Patterns of inter group /inter departmental interaction and partnership, Patterns of inter organizational partnership, Groups, departmental and organizational work processes, Training and education programmes, Rules, Techniques, Communication channel, Structures, Manuals, Technology, Routines, Products (<i>Building Leadership, Building</i>

		<i>People, Building Partnership, Building Processes, Building Products)</i>
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We again emphasize the importance of interactions and interrelationships among and between the four areas. The micro/subjective area of organizational reality involves individual persons' mental processes such as perceptions, thoughts, intentions, beliefs, motives, willingness, desires etc. These realities are often difficult to observe, as they are mostly intangible. The micro/objective area of organizational reality involves the more tangible aspects of individual processes such as behavior and interaction patterns. The macro/subjective area of organizational reality involves intangible collective processes e.g. norms, values, political interest of groups, departments and organizations. The macro/objective area involves tangible collective organizational realities such as vision, mission statements, the visible part of organizational cultures in terms of the way of celebrating success and failures, the way of using symbols, work processes, rules, routines, technology, manuals, structures, collective behavior patterns, communication channels, reward systems, products, profits etc.

Seen from *the "4P" model*, large parts of Building Leadership and the two Ps - People and Partnership Building - belong to the micro areas, and large parts of the last two Ps - Processes and Products -belong to the macro areas of organizational realities. However as the organizational realities are not divided into different categories or levels, they are overlapping in all areas. Thus the most important point is here that all four aspects of realities are important, and there are mutual interrelationships between all four areas.

The micro/subjective realities will often be the *key performance indicators* and input for micro/objective realities and vice versa. Similarly micro/subjective realities are also closely interrelated to macro /subjective realities. Individual persons can

initiate an action (micro objective) driven by some personal motives (micro subjective), however those personal motives might have been shaped, modified and constrained by the organizational culture (macro subjective) or the existing hierarchical structure (macro objective). In other words, individuals' behaviors and actions are often constrained and shaped by the environments.

We will now consider a Simple Approach for measuring Innovation Excellence. During the spring of 2000 a questionnaire survey was run in a large Danish manufacturing company. The questionnaire comprised 80 questions related to innovation. Respondents were asked to rank each question, formulized as statements, according to their perceived degree of *agreement* and *importance* using a scale ranging from 1 to 5. On the "importance" scale, a "1" indicates that the statement according to him/her is of very minor importance, while statements that score "5" are perceived as having very high importance. On the agreement scale, a "1" indicates that the respondent fully disagrees with the statement, while a score of "5" means that the respondent fully agrees with it. To fully agree (disagree) with a statement means for the first 7 critical success factors of the model (the enablers) that the respondent agrees (does not agree) that the driver (activity) behind the question (statement) has been implemented into daily practice. Generally the importance measurements (= I) can be understood as indications of the respondents' needs and the agreement measurements (= P) as indications of the company's performance. Any negative difference between perceived indicated performance and perceived importance ($P - I$) can be regarded as a gap indicating an opportunity for improvement seen from the respondents' points of view. 260 employees involved within the innovation area were invited to participate in the survey and to fill out the developed questionnaire. 131 questionnaires were returned giving a response rate of approximately 50%.

The gaps between importance and agreement were analyzed and the biggest gaps were regarded as most interesting to analyze. It is assumed that the biggest gaps are signals from the respondents about where to improve first. Therefore the first step

in the simple approach is to rank the statements according to the size of the gaps. Table 2 shows the statements with the biggest gaps – first the enabler statements and then the result statements. A quick overview tells us that according to the ranking in table 2 the enabler factors should be prioritized for improvements in the following order: 1. Leadership, 2. Partnership & Resources, 3. People, 4. Processes, and 5. Strategy.

Table 2: Identification of Statements with the biggest gaps

Criterion	Statements from Enablers	(importance, agreement)	Gap
Leadership	The organization is characterized by an innovative culture (time to think freely and follow up on own ideas, learn of experiences, risk willingness etc.), entrepreneurship.	(4.51, 3.30)	1.21
Leadership	Important information is shared quickly and accurately to the right persons - up, down and sideways in the organization.	(4.47, 3.45)	1.02
Leadership	Creating, acquiring and transferring of new knowledge and skills are a part of the company culture.	(4.49, 3.52)	0.97
Partnership/ Resources	The resources necessary to accomplish the roles set up for the company's innovation program are clearly mapped out	(4.22, 3.33)	0.89
Partnership/ Resources	The company allocates consequently and visibly resources for the innovation	(4.16, 3.28)	0.88
People	The reward system related to innovation is known by everybody and reviewed and improved collectively	(3.88, 3.03)	0.85
Leadership	The organization is always scanning the horizon and is proactively anticipating change	(4.32, 3.48)	0.84
Partnership/ Resources	The employees participate in external innovation activities, creativity discussions, creativity teams etc.	(3.98, 3.18)	0.80
People	All people try to improve and develop themselves in order to cope with future challenges within the innovation area	(4.38, 3.66)	0.72
People	Core team members use 80% or more of their time on the innovation project	(4.21, 3.52)	0.69

Processes	Bench Marking data from “best practices” within innovation are used to set objectives for future improvements	(3.97, 3.30)	0.67
Processes	Faulty omission of key activities in the new product development process seldom happens	(4.33, 3.68)	0.65
People	The innovation team consists of committed employees from different departments which participate equally in the project	(4.11, 3.48)	0.63
Processes	Design errors, production errors, communication errors, marketing errors, etc. are continuously reduced or eliminated throughout the new product development process	(4.39, 3.78)	0.61
People	Team members are empowered to make decisions about their innovation project and to participate in the planning and decision making for innovation	(4.24, 3.67)	0.57
People	People in the organization possess a willingness to accept and adopt ‘external’ ideas	(4.10, 3.54)	0.56
Strategy	Visions, goals, and strategies for innovations are communicated clearly to everybody	(4.26, 3.81)	0.45
Strategy	Success criteria for the innovation program have been formulated (guidelines, minimum standards, result benchmarks etc.)	(3.88, 3.49)	0.39

	Statements from Results:		
People	Employees’ motivation and commitment have increased during the last 4 years	(4.46, 3.70)	0.76
Products/ Sales	The percentage of sales provided by innovations that are less than four years old has increased	(4.16, 3.50)	0.66
Products/ Sales	The number of innovations that provide the company with a sustainable competitive advantage has increased the last three years	(4.36, 3.71)	0.65
Products/ ROI	Return on investment (ROI) of the company’s innovation program has increased during the last four years	(4.11, 3.60)	0.51

An important finding by using *the simple approach* was that: *Improve first the “soft aspects of innovation” (= Leadership, People, and Partnership) before trying to improve the “hard or logical aspects” (=Processes, Strategy).*

Lesson 9. The “4P” Model of the TOYOTA Production System

In his book called *The Toyota Way* (2004) Jeffrey K. Liker describes the 14 management principles behind the world’s most successful car manufacturer. These 14 principles have by Liker been divided into four categories, all starting with “P” – Philosophy, Process, People/Partners and Problem Solving (see figure 1). An overview of the 14 management principles related to the four categories is presented in table 1 below.

By comparing Liker’s “4P” model with the model discussed in the previous lesson it is obvious that there is a lot of overlap. First the “4P”, which in fact in Liker’s model comprises “5P”. But when we regard the first P (Philosophy) as part of Leadership, the two models have the same number of Ps. *Problem Solving* is not a specific category in our model because it is integrated in the categories of *Processes* and *Products*. Instead, we have a specific category on *Products*, which is both a result of the company’s manufacturing, administrative and service processes, and the process of new product development. The order of the Ps in the two models differentiates a little bit, but the models have the same start with relation to the importance of *Leadership* and *Philosophy* which guides strategies, activities, problem solving etc in the other levels of the two models.

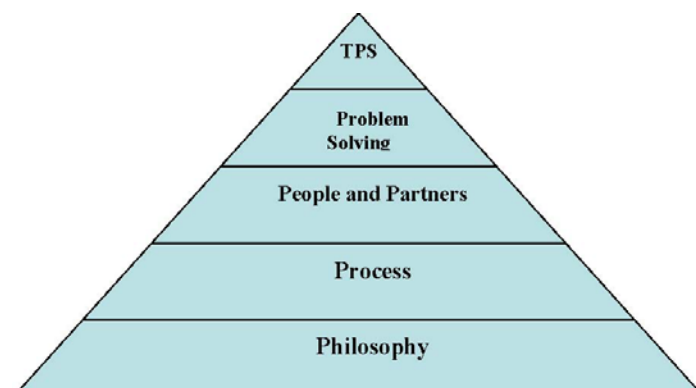


Figure 1: The “4P” Model of Toyota Production System (TPS)

The 14 principles of the Toyota Production System have been important principles in building excellence into Toyota Corporation and the whole supply-chain. We recognize these 14 principles as important principles to understand for any company and the successes of Toyota compared to other car manufacturers indicate that managers should study these principles carefully before they eventually try to adapt them or other overlapping principles. However, we do not regard the fourteen principles as being the ultimate number of principles which companies must work with in order to embark on and have success with the long *journey* to organizational excellence. Even if it may be argued, that all 14 principles are important and none of them can be ignored, it is refreshing to consider the overall simple model in figure 2. People can remember two principles but not fourteen! Nevertheless the 14 principles can be abstracted and may be regarded as a detailed check list which supplements the simple overall model in fig. 2.

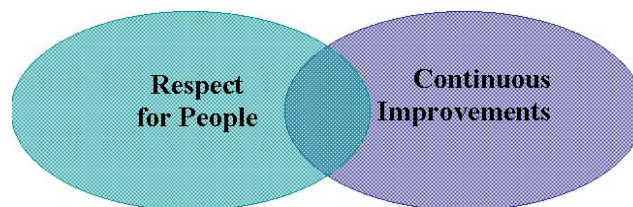


Figure 2: Toyota’s DNA

Here are the Categories and the 14 Management Principles of *the Toyota Way*
Category Management Principles:

Philosophy. 1. Base management decisions on a long-term philosophy, even at the expense of short-term financial goals

Process 2. Create process “flow” to surface problems.

3. Use pull systems to avoid overproduction. Eliminate waste.

4. Level out the workload.

5. Stop when there is a quality problem

6. Standardize tasks for continuous improvement.

7. Use visual controls so no problems are hidden.

8. Use only reliable thoroughly tested technology.

People and Partners. 9. Grow leaders who live the philosophy.

10. Respect, develop and challenge your people and teams. Grow them.

11. Respect, challenge, and help your suppliers.

Problem Solving 12. Continual organizational learning through Kaizen (Continuous Improvement and Learning).

13. Go see for yourself to thoroughly understand the situation.

14. Make decisions slowly by consensus, thoroughly considering all options; implement rapidly

CONCLUSIONS – Past, Present and Future of TQM and Excellence Models.

During the early period of a focus on excellence TQM gradually evolved inspired by the Japanese management philosophy called CWQC (Company Wide Quality Control). The conceptual and philosophical foundation of TQM recognizes the importance of intangible and cultural aspects of organizational realities in contrast to earlier theories and practices of quality, which ignored or underestimated those aspects. Numerous descriptions of the quality evolution, i.e. from a rather mechanistic narrow framework to a more broad and holistic framework, are related to the integration of intangible aspects of the TQM framework. The European Excellence Model is a further development of the TQM philosophy, and should be understood from the ongoing evolutionary continuity of the quality movement.

Seen from a Meta level, TQM and the excellence approach requires a fundamentally different managerial paradigm and mental model compared to earlier quality approaches. Earlier quality approaches were rooted in a positivistic and reductionist paradigm which is well matching when focusing and understanding the formal and tangible aspects of organizations. However, this positivistic paradigm is not suitable for understanding intangible and cultural

aspects. As we have discussed through the lessons, one major problem with the various excellence models and the managerial practices of these models seems to be that people still interpret these models from a positivistic and mechanistic paradigm. The high failure rate with implementation of TQM and excellence models seems to be related to this problem. The phenomenon can be illustrated by an analogy of a doctor who tries to cure a mental sick person by carrying out a physical surgery. In order to understand the complex realities of organizations and its environments organizations need a new cure (framework) which can capture both depth (qualitative) and breath (quantitative).

The suggested “4P Model” is an attempt to provide such a framework which may help to overcome organizations’ current problems when trying to implement TQM by using existing excellence models. With this model and its related principles we have tried to simplify the integration of tangible and intangible aspect (objective and subjective) as well as individual and organizational levels (micro and macro) into the framework. The “4P model” can be used as a guideline for implementing TQM by integrating the paradigm level with the methodological level.

Toyota’s “4P model”, suggested by Liker (2004), seems to have the same theoretical foundation and paradigms as our “4P Model” and the factors are almost the same. The main difference is that in Liker’s model *Problem Solving* (Continuous Improvement and Learning) is a specific factor which in our “4P Model” is regarded as an important sub-factor integrated into all factors starting with the Leadership Factor. We have instead suggested the last P of the model to comprise the *Product Development and Innovation* processes including *Continuous Improvements and Learning*. Both 4P models can be characterized as having a balanced focus on the soft side of management, such as values and culture, with the hard side such as tools, measurements and logical analyses. Both 4P models have a high focus on the People factor which also was of high importance in Tom Peters and Nancy Austin’s simplified excellence model and the revised Xerox excellence model from 2002. We believe that understanding and recognising the

full range of realities always includes the company culture and respect for people's values, and we believe that corresponding paradigms is a prerequisite for having success with the journey towards excellence.

In order to capture and understand the full range of realities we recommend that various *qualitative ideas and approaches* such as *sense making, imagination, story telling, a symbolic-interpretive approach* to be adopted along with already well adopted *quantitative approaches*. Managerial tools and techniques can be more properly utilized and hence people better mobilized when there are consistencies between realities, intentions, people's basic beliefs (paradigms) and the chosen approaches. This is the challenge of the future for TQM and Excellence and for managers in the too many bad managed companies all over the world.

At the end of this article we show the text from an embroidery, which we have found at the public market in Seattle. The embroidery text definitely shows some wisdom contributing to the understanding of what is *Excellence*.

Excellence Can be attained if you...

Care more Than others think is voice.

Risk More Than others think is safe.

Dream more Than others think is practical.

Expect more Than others think is possible.

Lesson 10. Innovation

1. Introduction

It is widely understood that a firm wishing to build and sustain competitive advantage must innovate. If a firm wishes to meet the needs of target customers better than rivals do, then a firm needs to devise ways to do that. That is, it must innovate. And since rivals have a habit of imitating a firm's successful innovations (or improving upon those innovations), a firm needs to continually innovate.

There are various types of innovation that we will consider in this class:

- *Technological product innovations*: To most people, the word innovation conjures up the idea of new products or improved products through the work of engineers and/or research scientists. Examples would include the phonograph (invented 100 years ago by Thomas Edison), and the iPod (invented at Apple more recently).
- *Product innovations involving new forms of value creation*: Some innovations do not involve changes to the physical product, but rather involve new ways of creating value for the customer. One example is Amazon's innovations in on-line book-selling. The physical books are the same, but the way that a customer acquires the books is new. Another example is Virgin Atlantic Airways, which introduced new ways of meeting the needs of business travelers. For example, the airline provides office equipment in airports so that business people can remain productive while on the road, and provides shower facilities upon landing so that business people need not go to their hotel before heading to business meetings.
- *Process innovations*: These innovations are less visible than product innovations, since they occur within firms as they seek new ways to gain efficiency or improve quality. Have you suggested or introduced process innovations where you work?
- *New management methods*: Innovations can even involve management methods. For example, 100 years ago Dupont developed return-on-investment calculations to assess its projects. In the latter half of the 19-th century, Toyota developed an approach to quality improvement that differed radically from the approaches used by the American automakers – Toyota looked to its line employees to improve its operational methods.

2. How Does Innovation Come About?

Does innovation come about through genius or by design? Not surprisingly, the answer is *both*.

Genius: Innovation requires imagination. It involves thinking of solutions that others have not thought of before. Often, innovation comes from taking existing knowledge and applying it to a new use. *Can you think of any examples?*

Design: Nevertheless, there are things a person or organization can do to generate innovations:

- Look for opportunities. A person or firm who searches for opportunities is far more likely to innovate.
- Volume of ideas. Most ideas do not pan out. But a few do. To produce many innovations, a firm needs to generate many, many, many ideas.
- Do not stifle new ideas: In non-innovative organizations, new ideas are stifled. To be fair, it is beneficial to kill ideas that will not work out, because continuing to invest in those ideas is wasteful. However, ideas that are promising need to receive support within the organization and need funding. Organizations that are not receptive to new ideas may have some of the following problems: management arrogance, managers' fear of a loss of power, or a simply a lack of foresight.

Most innovations arise from one of the following situations:

a) *Observations of unexpected outcomes.* Identifying the cause of an unexpected outcome is a common form of discovery. Based on such a discovery, a firm can innovate.

b) *Needs.* There is a saying that “necessity is the mother of invention”. When confronted with a particular need, people focus harder on finding a solution. People tend not to solve problems they did not know they had.

c) *External changes.* Changes in the industry, in the market, in demographics and in culture can create new opportunities for filling needs.

d) *New Knowledge.* New technology, of course, can create new ways of accomplishing tasks.

3. Evolutionary and Revolutionary Innovation

Evolutionary innovation involves improving an existing product or an existing way of doing business. It is incremental by nature. For example, each year, the automobile gets increasingly sophisticated, but these innovations are evolutionary by nature. Until hybrid vehicles were introduced recently, we had not seen a radically new automobile for many decades. Yet, we saw many innovations. Automobiles increasingly used electronics and microchips. There had also been new features introduced over the years, such as cruise control, anti-lock brakes, airbags, crash-absorbing bodies, etc. Better manufacturing methods had also improved the reliability of engines.

Similarly, the methods of doing business within the industry have also remained stable. For example, the dealership method of distribution remains the predominant method of selling. Yet, there have been changes. For example, firms have standardized the choices of options by offering option packages.

Revolutionary innovation involves a fundamental change in a product or in a way of doing business. For example, several corporations (such as Ballard Power Corp.) are working on fuel cell technology that may one day replace internal-combustion engines. Alternatively, electric cars may become the norm. One of these completely new products could make much of what is now known about internal combustion engines obsolete. Similarly, online book-selling is very different from traditional book-selling.

The distinction between evolutionary and revolutionary innovation is not clear-cut, and may depend on whose perspective one considers. For example, keyless locking mechanisms may be a small innovation from the perspective of an automaker, but a radical innovation from the perspective of firms that supply those mechanisms. Nevertheless, from a strategy perspective, there are some differences:

a) *Size of investment*: Evolutionary innovations involve relatively small investments by the innovator. Revolutionary innovations involve much larger investments; in many cases, a failure of this type of innovation will bankrupt the company.

b) *Competitive objective*: Evolutionary innovation seeks to carve out small

advantages over competitors, whereas revolutionary innovations seek to make competitors almost irrelevant.

c) Response of competitors: Competitors are likely to imitate successful evolutionary innovations. However, revolutionary innovations are much harder to imitate, because incumbents have designed their business to produce value in a significantly different way. The revolutionary innovation constitutes a substitution threat to incumbents. Their responses to a substitution threat are likely to be one of the responses we identified when discussing substitution threats in this course.

4. How to Foster Innovation

Technological product innovations.

Organization. Many firms use teams to develop their innovations. In today's world, innovations are rarely a one-person exercise. An effective team usually needs the following types of members:

- a project leader who has the status and ability to obtain the resources and cooperation necessary to properly develop the product,
- members from R&D, who develop the product and manufacturing process,
- members from production, who work with R&D to promote designs that are easy to manufacture and who assist on the development of the manufacturing process,
- members from marketing, who provide information on customer needs and preferences, to promote designs that optimize willingness-to-pay.

Some firms use permanent teams, while others form teams on a project-by-project basis. Some companies allow their researchers a certain amount of time to work on whatever project they want (as long as there is some potential payoff for the company). For example, Hewlett Packard allows its researcher 10% of their time, and 3M allows its researchers 15% of their time. 3M's Post-It notes are a famous outcome of this policy. Post-It notes were developed by a researcher who wanted to figure out how to keep bookmarks from falling out of books.

Culture. Obviously, innovative firms need a culture of innovation. The firm needs to reward innovations, tolerate failure, find out about ideas among its employees, and hire entrepreneurial people.

Process. Two researchers, Andrew Hargadon and Robert Sutton, have found that highly innovative firms have many of the traits found in Thomas Edison's lab of 100 years ago. Those traits are:

- They capture good ideas: Innovative firms are staffed by people who have a curiosity about how things work, and about how others have solved problems – even in unrelated industries.
- They keep ideas alive. One of the best ways to access knowledge previously acquired is through personal networks within the firm. In innovative firms, people know what others in the firm are doing and have done in the past. When facing a problem, they know who to consult. Ideas that did not solve a problem in the past may very well solve a different problem now.
- Their people imagine new uses for old ideas.
- They test and let go when necessary. Ideally, ideas should be tested quickly and cheaply at first. If they do not work, individuals need to let go of the idea and move on.

5. New forms of value creation

The key to finding new ways of creating value is to understand what customers want. What can senior management do to understand the needs of the customer? How can management get its employees to have a customer-focused attitude? What else can a firm do to find out what customers value?

Process innovation. Re-engineering. Re-engineering is the “fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed.”

Some people regard reengineering as something different from innovation.

However, we adopt a broader definition of innovation, and regard re-engineering as a type of evolutionary innovation in business methods. An example is as follows.

IBM Credit is a division of IBM that manages customer financing for IBM computers (mostly mainframes). The process for approving financing used to go through 5 functions and on average took 7 days. The different departments that handled the application were as follows:

- information collection (which logged the request from the IBM salesperson),
- credit-checking department (which investigated the customer's credit worthiness),
- contract department (which drafted up a contract),
- pricing department (which determined the interest rate and the terms of the loan),
- dispatching department (which finalized the paperwork and sent it to the salesperson).

After hearing many complaints from customers and salespeople, two senior managers investigated the process and found that the average application involved only 90 minutes of actual work. Much time was wasted as the application made its way from one department to another. The managers therefore re-engineered the approval process to cut the process from 7 days down to 4 hours. They did this by having only one person to do all the functions. This required retraining employees and re-arranging databases so that the approval personnel had all the information they needed on their computers. Cases with special issues were referred to a team of experts on hand to deal with those issues.

Total Quality Management (TQM). TQM is a way of doing evolutionary innovation either on products or business processes. TQM is a management philosophy that was introduced by W. Edwards Deming (among others). According to this philosophy, firms should have an intense drive for quality. Until the 1980s, North American companies paid little attention to Deming's ideas, but the Japanese embraced them. (The most prestigious award for manufacturing

excellence in Japan is named after Deming – who is an American.) In the last decades, his ideas have gained more prominence in North America, since it became apparent that the Japanese had learned how to produce superior products.

Deming's main views about quality are as follows:

- The firm should maintain a culture that fosters a relentless drive for continual improvement at all levels.
- A firm should not rely on inspections to ensure quality, but should rather build quality into the product in the first place.
- People like to do good work, so a firm should eliminate barriers that interfere with their effectiveness and pride of workmanship. Barriers to eliminate include:
 - communication barriers between departments,
 - fear, pressure tactics and work standards imposed on employees (Deming argues that poor quality and poor productivity are usually attributable to poor systems, not poor employees),
 - reduce the customer's total cost, not just the price tag of your product.

6. Innovative Management Methods

Innovative management methods require managers to break away from orthodox thinking about how business must be done. This is not easy to do. Many practices have developed over time because they have worked.

In recent years, one of the most significant developments in management methods has been the open-source approach to developing software. Historically, it was thought that firms must maintain ownership and protect their intellectual property. However, open-source software involves development of new products by people all over the world who volunteer their time and efforts towards a particular project. Nevertheless, firms are able to profit from involving themselves in these activities. For example, a small Charlottetown firm, Silverorange, designed the visual layout for Firefox (including the icon). That work (which was

done for free) has led to numerous lucrative consulting projects for the firm.

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- credit-checking department (which investigated the customer's credit worthiness),
- contract department (which drafted up a contract),
- pricing department (which determined the interest rate and the terms of the loan),
- dispatching department (which finalized the paperwork and sent it to the salesperson).

After hearing many complaints from customers and salespeople, two senior managers investigated the process and found that the average application involved only 90 minutes of actual work. Much time was wasted as the application made its way from one department to another. The managers therefore re-engineered the

approval process to cut the process from 7 days down to 4 hours. They did this by having only one person to do all the functions. This required retraining employees and re-arranging databases so that the approval personnel had all the information they needed on their computers. Cases with special issues were referred to a team of experts on hand to deal with those issues.

Total Quality Management (TQM). TQM is a way of doing evolutionary innovation either on products or business processes. TQM is a management philosophy that was introduced by W. Edwards Deming (among others). According to this philosophy, firms should have an intense drive for quality. Until the 1980s, North American companies paid little attention to Deming's ideas, but the Japanese embraced them. (The most prestigious award for manufacturing excellence in Japan is named after Deming – who is an American.) In the last decades, his ideas have gained more prominence in North America, since it became apparent that the Japanese had learned how to produce superior products.

Deming's main views about quality are as follows:

- The firm should maintain a culture that fosters a relentless drive for continual improvement at all levels.
- A firm should not rely on inspections to ensure quality, but should rather build quality into the product in the first place.
- People like to do good work, so a firm should eliminate barriers that interfere with their effectiveness and pride of workmanship. Barriers to eliminate include:
 - communication barriers between departments,
 - fear, pressure tactics and work standards imposed on employees (Deming argues that poor quality and poor productivity are usually attributable to poor systems, not poor employees),
 - reduce the customer's total cost, not just the price tag of your product.

6. Innovative Management Methods

Innovative management methods require managers to break away from

orthodox thinking about how business must be done. This is not easy to do. Many practices have developed over time because they have worked.

In recent years, one of the most significant developments in management methods has been the open-source approach to developing software. Historically, it was thought that firms must maintain ownership and protect their intellectual property. However, open-source software involves development of new products by people all over the world who volunteer their time and efforts towards a particular project. Nevertheless, firms are able to profit from involving themselves in these activities. For example, a small Charlottetown firm, Silverorange, designed the visual layout for Firefox (including the icon). That work (which was done for free) has led to numerous lucrative consulting projects for the firm.

Lesson 11. Benchmarking

1. What is benchmarking?

There are many benchmarking definitions. Listed below are three most commonly referred to by benchmarking experts.

“A process of industrial research that enables managers to perform company-to-company comparisons of processes and practices to identify the "best of the best" and attain a level of superiority or competitive advantage” (Camp, 1989).

“The continuous and systematic process of identifying, analyzing, and adapting industries' best practices that will lead an organization to superior performance” (Spendolini, 1992).

“The practice of being humble enough to admit that someone else is better at something, and being wise enough to learn how to match and even surpass them at it” (American Productivity and Quality Center, 1993)

Benchmarking is a process of improving performance by continuously identifying, understanding, and adapting outstanding practices and processes found

inside and outside the organization. Benchmarking is a systematic tool that allows a company to determine whether its performance of organizational processes and activities represent the best practices. Benchmarking models are useful to determine how well a business unit, division, organization or corporation is performing compared with other similar organizations. A benchmark is a point of reference for a measurement. The term 'benchmark' presumably originates from the practice of making dimensional height measurements of an object on a workbench using a gradual scale or similar tool, and using the surface of the workbench as the origin for the measurements (see figure 1).

There are many different reasons why a company would want to benchmark. When you benchmark you find out who is the best, you gather actionable data for change and process improvement, and you realize that there is a world outside of your own with great ideas that you can use. Benchmarking can enhance an organization's performance and the commitment of resources should not be taken lightly. Some of the more common reasons companies benchmark are to:

- Satisfy customers' needs and expectations (you should know what is important to your customers and what will meet their expectations).
- Discuss and understand the methods and practices needed to reach new goals (you should know what is needed to reach performance excellence and how to reach it).
- Achieve superior performance (you should be performing this study to improve the performance of the organization).
- Adapt best practices (through research you should be finding best practices that can improve your process).
- Develop and stimulate strategic goals/planning (if this study does not support the strategic plan then the study should not be performed).
- Stay informed on the state-of-the-art business practices (through research you will learn best practices that are on the *cutting edge*).
- Encourage creative thinking - get out of the box (while performing this study you will discover different creative ideas used by other organizations).

- Review/study competitive comparisons (research and interviews will provide information for you to compare your organization to).
- Accelerate process improvement (performing a study will provide you with information/results from others so that you can implement change quicker).
- Discover emerging technologies (research will provide you with new ways of doing things).

Benchmarking focuses on how to improve any given business process by exploiting "best practices" rather than merely measuring the best performance. Best practices are the cause of best performance. Studying best practices provides the greatest opportunity for gaining a strategic, operational, and financial advantage. The systematic discipline of benchmarking, then, is focused on identifying, studying, analyzing, and adapting best practices and implementing the results. To consistently get the most value from the benchmarking process, senior management may discover the need for a significant culture change. That change, however, unleashes benchmarking's full potential to generate large paybacks and strategic advantage.

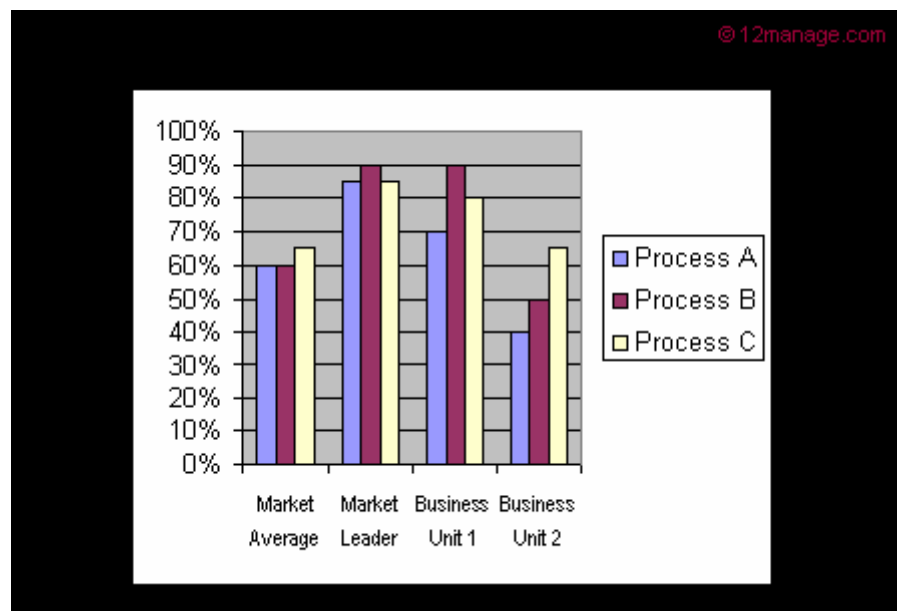


Figure 1. Benchmarking using a bar diagram

2. Improving by example

Senior managers at Xerox, Digital Equipment Corp., Motorola, GTE, AT&T, Chrysler, AMP, Texas Instruments, and other organizations strongly support benchmarking. Many executives vigorously work to ingrain its underlying ethic into their corporate culture. That ethic essentially says, "We continually learn by example." Inherent in this statement are several potent ideas: We continually seek to improve; we have not cornered the market on good ideas; our existing systems, methods, and ideas are continually open to change; change is good and we welcome it; we continually look outside ourselves for fresh inspiration; we freely adapt and adopt the most useful ideas we find; we want to meet and beat the best known performance in any process.

By benchmarking their own business units and those of other organizations, companies get the information they need to optimally adjust their performance goals and find ways to achieve them. Ideas are everywhere; the challenge is to habitually seek and adapt them. Experience proves that many ideas originate not just outside one's own company but also outside one's industry.

Senior-level cheerleading alone does not produce optimum results. As with any process, benchmarking works best when senior management acquires a deep understanding of it. Consider, for example, the issue of selecting an optimum benchmarking partner. Should the organization look only within its own industry or broaden the search possibilities?

By observing production methods in a Chicago slaughterhouse, Henry Ford got the inspiration for assembly line manufacturing. Telecommunications giant GTE discovered how to improve its field service by studying that of an elevator company. This worked well because field service held sufficient similarities across industries. On the other hand, the Ritz-Carlton hotel chain revamped its housekeeping process after benchmarking innovative best practices at a competitor's hotel.

Ironically, inexperienced benchmarking organizations also commonly err in not doing enough measurement. After completing a benchmarking project and implementing the findings, they fail to follow up by measuring the project's

operational effects and financial cost/benefit. Such follow-up gives senior management the information it needs to judge benchmarking's financial value and relative importance in meeting the organization's strategic objectives. It also provides ammunition to leverage the organization's investment in benchmarking by helping to promote the newly implemented practices throughout the enterprise and greater utilization of the benchmarking process itself.

Choosing an optimal benchmarking partner, then, requires a deep understanding of the process being studied and of the benchmarking process itself. Such understandings are also needed to properly adapt best practices and implement changes to each organization's unique culture. Traditionally, performance measures are compared with previous measures from the same organization at different times.

3. Benchmarking technology

There is a misconception about what benchmarking is and what benchmarking is not. Many senior executives think that benchmarking is a quick fix, easy with very little commitment, and a process that will make an impact in a short period of time. They do not realize that benchmarking comes with a huge commitment of time and resources. Benchmark is **not**:

- A cookbook process (*it can be time intensive*).
- A panacea for problems (*it will not solve all the problems at once*).
- Comparing to “similar” organizations (*it involves looking at other organizations different from your own*).
- A management fad (it needs management to be committed, it cannot just be the flavor of the month).
- Just a review of your own operations (it involves looking at your own operation and also looking outside at others).
- Just measurement (*it involves not just looking at measurements but also qualitative measures as indicators for success*).
- Industrial Tourism (it involves research and knowing what is going on

in house before going out of your house looking for information).

- A free trip (most benchmarking studies can be performed without going on a site visit).
- Reinventing the wheel (*there are many reports and studies available, do not start from scratch*).

There are five types of Benchmarking which are used in the business practice:

- Internal benchmarking (benchmark within a corporation, for example between business units),
- Competitive benchmarking (benchmark performance or processes with competitors),
- Functional benchmarking (benchmark similar processes within an industry),
- Generic benchmarking (comparing operations between unrelated industries),
- Collaborative benchmarking (carried out collaboratively by groups of companies (e.g. subsidiaries of a multinational in different countries or an industry organization).

Benchmarking tips (**the Do's**):

- Select the right team and mix of skills. The right team members will give you an understanding of the process being studied and give you a realistic perspective of the process.
- Select a benchmarking project that is tied to the strategic goals/objectives and is a core process.
- Obtain management commitment.
- Perform plenty of research.
- Communicate during the benchmarking study with all levels of those involved.
- Select benchmarking partners/companies outside of your own industry.
- Provide an incentive for a potential partner to participate (Note: In federal agencies the only incentive that can be offered is a comprehensive report).

- Focus on best practices and enablers, not just measurements.
- Select a benchmarking team that includes supporters and skeptics alike.
- Abide by the Benchmarking Code of Conduct and follow all the protocols.

Benchmarking mistakes (**the Don'ts**). Do not:

- Examine your own process.
- Think that your going on site visits “Feel Good” trips.
- Have goals and questions that are too vague.
- Have a scope that is too broad.
- Have team commitment.
- Perform upfront research.
- Partner with the wrong benchmarkee.
- Go outside of your own industry.
- Take action using the findings of the study.
- Have support to perform the study.
- Reinvent the wheel.
- Go on a site visit unprepared.

There are numerous steps and substeps in each phase of the benchmarking process.

The typical steps in a benchmarking process are:

- Scope definition,
- Choosing benchmark partner(s),
- Determining measurement methods, units, indicators and data collection method,
- Data collection,
- Analysis of the discrepancies,
- Presenting the results and discussing implications / improvement areas and goals,
- Making improvement plans or new procedures,
- Monitoring progress and plan ongoing benchmark.

Benchmarking generates substantial payback. Thirty highly successful benchmarking projects, each performed by a different company or agency, on average generated \$76 million the first year in higher net income and/or lower costs. Benchmarking is more likely to generate paybacks when it is driven by strategic objectives. Organizations implement their benchmarking findings more frequently when the benchmarking study is tied to their strategic objectives. Benchmarking generates the highest paybacks when the process is backed by senior management. Further, best practices discovered through benchmarking are utilized more frequently when implementation is strongly supported by senior management.

How can senior managers help their organizations launch quickly into more effective best-practice benchmarking? Several action items were recommended by member companies of APQC's International Benchmarking Clearinghouse:

- Insist on a formal methodology. Several such methodologies exist. Some companies just adopt one, while others customize one to fit their specialized needs.
- Insist on strict adherence to the Code of Conduct. The Code of Conduct was developed by APQC's International Benchmarking Clearinghouse and has become a de facto standard utilized by virtually all benchmarkers worldwide. The Code minimizes the risk and establishes the protocol for organizations that share intellectual property - i.e., benchmarking information-to their mutual benefit while honoring legal antitrust issues.
- Insist on utilizing a systematic process classification framework. Benchmarking focuses on how a given organization performs a specific business process. But the process of "managing human resources," for example, can mean different things to the benchmarker, the process owner, the senior executive, and the best-practice company being studied.

5. Costs and limitations

There are costs to benchmarking, although many companies find that it pays for itself. The three main types of costs are:

- a) Visit costs. This includes hotel rooms, travel costs, meals, a token gift, and lost labor time.
- b) Time costs. Members of the benchmarking team will be investing time in researching problems, finding exceptional companies to study, visits, and implementation. This will take them away from their regular tasks for part of each day so additional staff might be required.
- c) Benchmarking database costs. Organizations that institutionalize benchmarking into their daily procedures find it is useful to create and maintain a database of best practices and the companies associated with each best practice.

There are also certain limitations of benchmarking. Benchmarking is a tough process that needs a lot of commitment to succeed. It is time-consuming and expensive. More than once benchmarking projects end with the 'they are different from us' syndrome or competitive sensitivity prevents the free flow of information that is necessary.

6. Competitive benchmarking

Competitive benchmarking examines the products, services and processes of competitors and then compares this information to a company's own internal operations data. In making specific intra-industry comparisons, an organization gains information about common marketing practices, available work force, and suppliers. Companies can also assess its relative position in the marketplace. The approach is illustrated by figure 2.

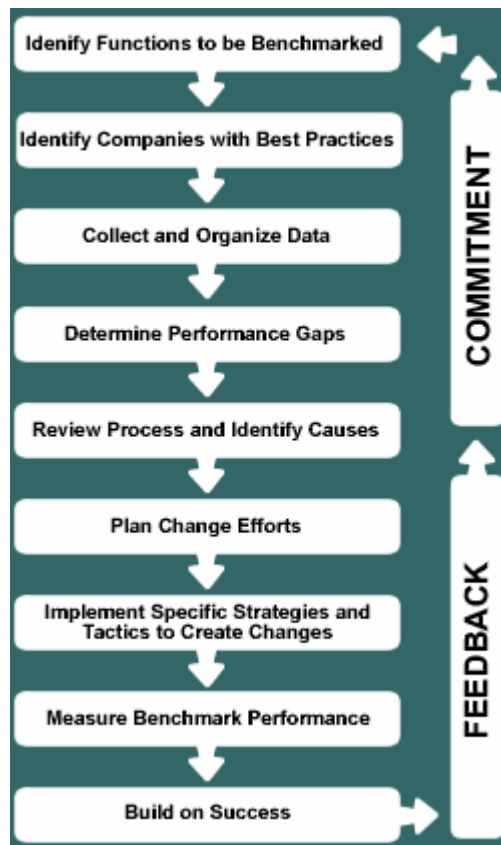


Figure 2. Competitive benchmarking

7. Kaizen and competitive advantage thinking.

Business benchmarking is related to two interesting approaches: *Kaizen* and *competitive advantage* thinking.

What is Kaizen? The Kaizen method of continuous incremental improvements is an originally Japanese management concept for gradual, continuous (incremental) change (improvement). Kaizen is actually a way of life philosophy. It assumes that every aspect of our life deserves to be constantly improved. The Kaizen philosophy lies behind many Japanese management concepts such as: Total Quality Control, Quality Control circles, small group activities, labor relations. Key elements of Kaizen are: quality, effort, involvement of all employees, willingness to change, and communication. Japanese companies distinguish between: *Innovation*, a radical form of change, and Kaizen, a continuous form of change. Kaizen means literally: change (kai) to become good (zen).

The five foundation elements of Kaizen (see figure 3) are Teamwork, Personal discipline, Improved morale, Quality circles, Suggestions for improvement.

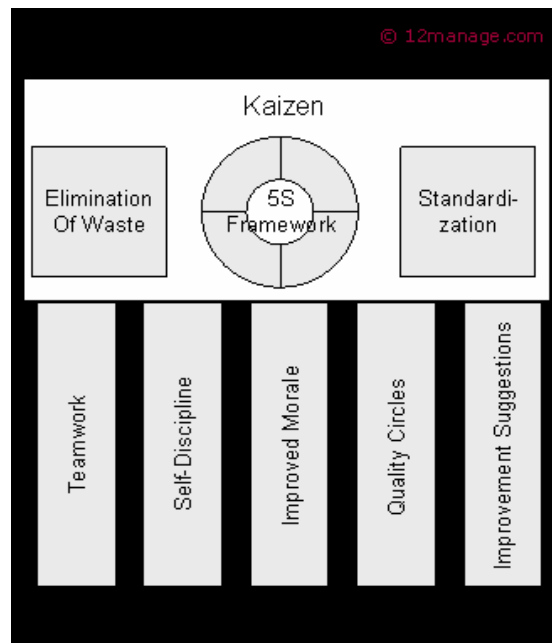


Figure 3. The five foundation elements of Kaizen

When should the Kaizen philosophy be applied? Although it is difficult to give generic advice it is clear that it fits well in gradual, incremental change situations that require long-term change and in collective cultures. More individual cultures that are more focused on short-term success are often more conducive to concepts such as Business Process Reengineering.

When Kaizen is compared with the BPR method it is clear the Kaizen philosophy is more people-oriented, more easy to implement, but requires long-term discipline and provides only a small pace of change. The Business Process Reengineering approach on the other hand is harder, technology-oriented, it enables radical change but it requires considerable change management skills.

Competitive advantage. According to the Competitive Advantage model of Porter, a competitive strategy takes offensive or defensive action to create a defensible position in an industry, in order to cope successfully with competitive forces and generate a superior Return on Investment. According to Michael Porter,

the basis of above-average performance within an industry is sustainable competitive advantage.

There are two basic types of Competitive Advantage: Cost Leadership (low cost) and Differentiation. Both can be more broadly approached or narrow, which results in the third viable competitive strategy – Focus. The following examples illustrate these types of advantage.

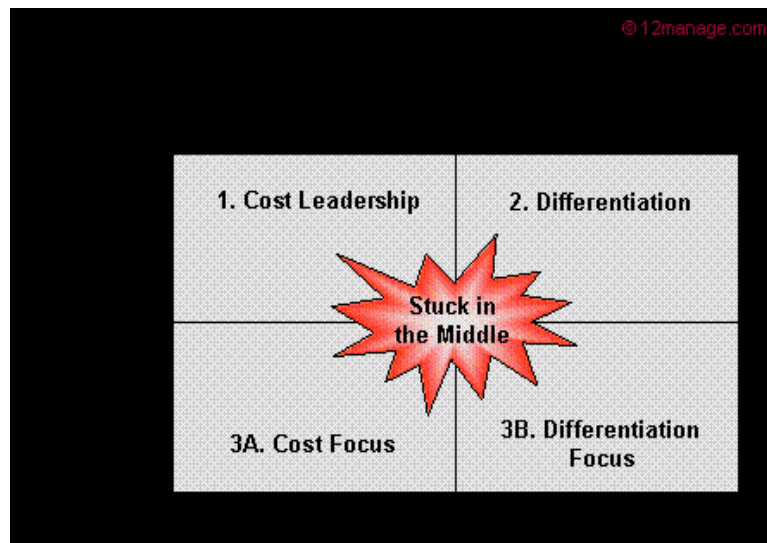


Figure 4. Competitive Advantage model

Competitive Advantage type 1: *Cost Leadership*. Achieving Cost Leadership means that a firm sets out to become the low cost producer in its industry. A cost leader must achieve parity or at least proximity in the bases of differentiation, even though it relies on cost leadership for its competitive advantage. If more than one company try to achieve Cost Leadership, this is usually disastrous. The result is often achieved by economies of scale.

Competitive Advantage type 2: *Differentiation*. Achieving of Differentiation means that a firm seeks to be unique in its industry along some dimensions that are widely appreciated by buyers. A differentiator can not ignore its cost position. In all areas that do not affect its differentiation it should try to decrease cost; in the differentiation area the costs should at least be lower than the price premium it

receives from the buyers. Areas of differentiation can be: product, distribution, sales, marketing, service, image, etc.

Competitive Advantage type 3: *Focus*. Achieving Focus means that a firm sets out to be best in a segment or group of segments.

Sometimes, there is a situation of two mixed variants: Cost Focus and Differentiation Focus. This is usually a recipe for below-average profitability compared to the industry. Still, attractive profits are possible if and as long as the industry as a whole is very attractive.

Conclusion

Comparing performances and processes with 'best in class' is important and should ideally be done on a continuous basis (the competition is improving its processes also...).

Benchmarking's positive influence extends beyond improving a particular business process. It also promotes the emergence and evolution of a "learning culture" throughout the enterprise-a key to continuous improvement, total quality, and competitiveness over the long term. Senior management is challenged more than ever by issues of quality, costs, competitiveness, rapid change, old culture, new technology, and-in some cases-the need to reinvent the enterprise.

Lesson 12. Communication strategies for organizational excellence

1. Introduction

Excellence, like beauty or political correctness, is hard to define. What does excellence look like? How can you know if you are on the right track? Shareholders measure excellence by quarterly and annual reports that tell them the return they are getting on their investment. To these shareholder measurements, CEOs add how difficult or easy the results are to achieve. Sweating, fretting and

debting one's way to a good-looking bottom line probably does not feel like one is running an excellent company. So CEOs further define excellence to include efficiency, effectiveness, teamwork, loyal customers and ample budgets.

From the employees' point of view, an excellent organization shows that it values the folks whose work achieves the results for which shareholders hope and pray. Excellence means better-than-average pay, benefits, and working conditions, plus the "atmosphere" that's known as culture. All of these concepts of excellence are attainable if one big "IF" is achieved: IF *excellent communication is the norm*.

But what does excellent communication look like, and how does it contribute to performance excellence? On the next pages you will find 10 examples of how a strategy, expressed through actual behaviors, can create a communication climate conducive to excellent business results. These "Ten Ways Companies Create Excellence Through Excellent Communication" are based on 20 years of listening and learning about organizational excellence.

"Ten Ways" should not be confused with "10 easy steps." These are not easy. But neither are they impossibly hard. They are, in fact, quite natural when you stop to think about them. And that is why we put them together: to encourage people to see that pathways to excellence are all around them.

These are only 10. You may have discovered others.

2. Ten Ways Companies Create Excellence through Excellent Communication

Strategy 1. Communication professionals understand:

- the business environment and external challenges,
- the organization and internal challenges,
- communication principles and organizational effectiveness,
- research, networking and strategic planning techniques.

Behaviors. Communication professionals consistently:

- see themselves as integral to organization management,
- study business process and organizational dynamics,
- advance their knowledge of their own profession,

- improve their knowledge and skills in thinking,
- problem-solving and planning.

Results. Communication professionals add value to the organization's strategic team when principles, values, strategies and action plans are developed for the organization. Employees understand and support change initiatives because the reasons for the need were clearly communicated and people impacted were involved in the solution. Leaders from other disciplines involve communication professionals in planning and introducing change at any level. Communication is seen as *everyone's job*, with communication professionals as key resources and facilitators.

Strategy 2. Communication goals are tied to business results.

Behaviors. The organization's vision, values and business plan drive the major "plan of work" for the communication group. Communicators create a comprehensive communication plan that supports the broad goals and specific strategies of the organization, using:

- interviews with key leaders to understand the operational tactics and anticipated challenges,
- an investigation of external pressures and opportunities,
- assessment of employee attitudes, suggestions and communication needs.

Results. Communication throughout the company makes sense and helps employees make sense of internal and external factors influencing the organization. Employees at all levels understand the organization's key goals and priorities and direct their efforts to support them.

Strategy 3. Communicators create strategic alliances with key business units:

- strategic planning,
- human resources,
- organizational development,
- training business unit managers

Behaviors. Communication professionals initiate partnerships with leaders in other disciplines in order to:

- understand and leverage the development of values, rewards and leadership principles,
- ensure that individual and group communication needs are considered during planning,
- ensure consistent messages between formal and informal communication,
- ensure that communication is integral to leadership and supervisory training and ensure that core messages sent during training are consistent with key messages in other channels,
- understand the challenges and opportunities of daily communication throughout the organization.

Results. Key messages are reinforced throughout the organization, demonstrating a clear, unified and strong sense of mission, vision, values and action. Employees see consistencies between what they read in official media, what they are told by their managers and the way the organization rewards desired behaviors. Work is accomplished efficiently and effectively, without the confusion and cross-purposes that come from one department's not knowing about or supporting the work of others. Problems are seen as joint challenges and successes as shared triumphs.

Strategy 4. Executives and managers model communication leadership.

Behaviors. Key managers are seen frequently asking, listening and talking with employees at all levels. Leaders encourage communication up, down and across the organization.

Results. Employees feel valuable; executives and managers learn from employees' ideas and provide opportunities for employees to see, identify with and trust leaders.

Strategy 5. Communication expectations are part of all management and supervisory positions.

Behaviors. Communication skills are part of management development training and included in performance reviews and career planning. Managers and supervisors get continuous feedback and coaching to help improve their

communication effectiveness.

Results. Confidence builds and communication improves at all levels of the organization, creating high personal and team performance and satisfaction.

Strategy 6. Key messages are planned and integrated throughout formal communication channels.

Behaviors. Supplementing informal communication, formal communication channels carry regular, relevant, timely and candid information to build awareness, understanding and support for business strategies.

Results. Repetition of key messages in a variety of media keeps employees focused and reinforces face-to-face discussions. Clear messages consistently delivered build understanding and trust.

Strategy 7. Informal communication is the norm.

Behaviors. Throughout the organization, executives, managers and associates are meeting and talking with peers in other departments, managers at all levels and customers. There are no barriers to information seeking and sharing.

Results. Information moves rapidly as needed to the point where it is needed. Little time is wasted trying to find information needed to complete a job. Requests for information are treated with the same importance as customer requests for products.

Strategy 8. Communication moves in all directions as needed.

Behaviors. Every communication includes and encourages a response. Leaders spend as much time listening as telling. Formal and informal channels encourage communication up, down , across and diagonally through the organization to assure that whoever needs information gets it as quickly and correctly as possible. Sources of information are valued because of their accuracy, speed and relevance, not their position in the hierarchy.

Results. Decisions take into account information from many perspectives. Sharing knowledge and skills is valued and rewarded, encouraging all employees to increase their value to the organization. Well-informed and highly valued employees continue to increase the speed of innovation , productivity and

profitability of the organization .

Strategy 9 Measurement and evaluation ensure continuous improvement.

Behaviors. Communication practices are carefully monitored through periodic interviews, surveys and focus groups. Communication professionals, individual leaders, work groups and business units use the results of communication audits to continuously improve their effectiveness.

Results. People throughout the organization understand the importance of good communication and know how to tell when communication is working or not working. Communication problems are identified and resolved, creating an environment free of misinformation and misunderstanding.

Strategy 10. Communication is managed as a strategic investment, not an expense.

Behaviors. Communication professionals research and present budgets that:

- reflect priorities tied to key business results,
- choose strategies that leverage costs,
- include objective measurements to evaluate effectiveness.

Leaders recognize the “return on investment” of a well-informed, well-motivated work force by:

- adequately funding technology equipment, software and training to allow fast, easy access to information by those who need it
- funding communication efforts that clearly support the organization’s primary goals

Results. People have easy and fast access to information, allowing them to make good business decisions quickly. Good decisions lead to excellent results for the organization’s customers, shareholders and employees.

3. Conclusion

Communication does not "just happen." Effective communication requires effective strategy - a coherent plan of action. So, what are the typical features of

the effective communication strategy for Business Excellence?

The communication strategy is a part of the organization's overall policy and strategy. To be effective, strategy must take three factors into account simultaneously:

- Your goals and objectives;
- Operational constraints and imperatives - things you must do and things you cannot do;
- Pertinent conditions in the environment.

It presents clearly defined guidelines for ensuring effective vertical and horizontal communications in media, both within the organization and externally. It is reviewed, updated and improved periodically, based on feedback from stakeholders.

Module 5. Lesson 13. Costs of Quality

1. Introduction

The term 'Cost of Quality', refers to the costs associated with providing poor quality product or service. Here are several definitions of the Cost of Quality given by some authors.

Definition1. The costs associated in manufacturing with the prevention, discovery, and resolving of defects in products, whether the product is still in the manufacturing plant or in the customer's hands.

Definition 2. Quality cost is the sum of all costs a company invests into the release of a quality product. When developing a software product, there are four types of quality costs: prevention costs, appraisal costs, internal failure costs, and external failure costs.

Quality cost can also be defined as “the price of nonconformance” (Philip Crosby) or “the cost of poor quality” (Joseph Juran).

Quality processes cannot be justified simply because "everyone else is doing them" - but return on quality (ROQ) has dramatic impacts as companies mature. Research shows that the costs of poor quality can range from 15%-40% of business costs (e.g., rework, returns or complaints, reduced service levels, lost revenue). Most businesses do not know what their quality costs are because they do not keep reliable statistics. Finding and correcting mistakes consumes an inordinately large portion of resources. Typically, the cost to eliminate a failure in the customer phase is five times greater than it is at the development or manufacturing phase. Effective quality management decreases production costs because the sooner an error is found and corrected, the less costly it will be.

2. Quality cost structure

Like all things there is a price to pay for quality. This total cost can be split into two fundamental areas (see figure 1):

a. **Non Conformance.** This area covers the price paid by not having quality systems or a quality product. Examples of this are:

- (1) Rework. Doing the job over again because it was not right the first time.
- (2) Scrap. Throwing away the results of your work because it is not up to the required standard.

- (3) Waiting. Time wasted whilst waiting for other people.

- (4) Down Time. Not being able to do your job because a machine is broken.

b. **Conformance.** Conformance is an aim of quality assurance. This aim is achieved at a price. Examples of this are:

- (1) Documentation. Writing work instructions, technical instructions and producing paperwork.

- (2) Training. On the job training, quality training, etc.

- (3) Auditing. Internal, external and extrinsic.

- (4) Planning. Prevention, do the right thing first time and poka yoke.

- (5) Inspection. Vehicles, equipment, buildings and people.

These two main areas can be split further as shown below.

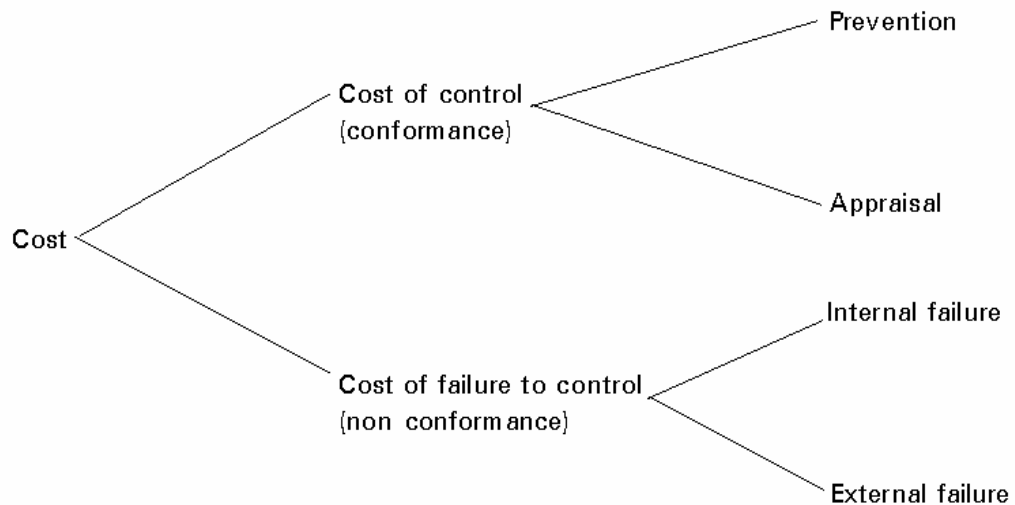


Figure 1. Quality cost structure

This shows the four segments of quality costs as proposed by Joseph Juran in 1951 to categorize these costs. These include internal failure, external failure, appraisal, and prevention costs.

a. **Prevention.** This area covers avoiding defects, planning, preparation, training, preventative maintenance and evaluation.

b. **Appraisal.** This area covers finding defects by inspection, audit, calibration, test and measurement.

c. **Internal Failure.** This area covers the costs that are borne by the organization itself such as scrap, rework, redesign, modifications, corrective action, down time, concessions and overtime.

d. **External Failure.** This area covers the costs that are born by the customer such as equipment failure, down time, warranty, administrative cost in dealing with failure and the loss of goodwill.

Let us now consider the four segments in more details.

Internal Failure Costs are the costs associated with defects found before the customer receives the product or service ex: scrap, rework, re-inspection, re-testing, material review, material downgrades. These costs include the evaluation,

disposition, and ensuing action that is related to the possibility of a part failing inspection.

In other words, the Internal Failure costs are the costs of coping with errors discovered during development and testing. These are bugs found before the product is released. As we mentioned previously, the further in the development process the errors are discovered, the more costly they are to fix. So the later the errors are discovered, the higher their associated internal failure costs will be.

The costs of internal failure need to be broken down into subcategories to help understand the types of costs that can occur.

- **Design Failure** costs are any unplanned costs incurred due to inherent design weaknesses in products that are in production. These failures can be broken down further as scrap due to design changes and rework because of changes in design.
- **Purchasing Failure** costs are all costs relative to buying items that are rejected upon delivery. For example, the disposition costs of rejected material, replacement costs, and rework of supplier rejected parts.
- **Operations** costs are all costs of nonconforming parts that are identified while in production. These include repair costs, labor loss, scrap, late shipment penalties, and corrective action costs.

Examples of Internal Failure costs are: rework, producing scrap, retesting, troubleshooting, additional inspection, bug fixes, regression testing, wasted in-house user time, wasted tester time, wasted writer time, wasted marketer time, wasted advertisements, direct cost of late shipment, opportunity cost of late shipment.

External Failure Costs- all costs involved with defective, or believed defective, products after delivery to the customer. Most often, these costs are related to not meeting the customer's needs or requirements of the users and associated with defects found after the customer receives the product or service ex: processing customer complaints, customer returns, warranty claims, product recalls. In other words, External failure costs are the costs of coping with errors

discovered after the product is released. These are typically errors found by your customers. These costs can be much higher than internal failure costs, because the stakes are much higher. These costs include post-release customer and technical support. Errors at this stage can also be costly in terms of your company's reputation and may lead to lost customers. Examples of External failure costs are: complaints, returns, field repair, recalls, replacements, loss of orders, technical support calls, answer books (for support), investigating complaints, refunds and recalls, interim bug fix releases, shipping product updates, warranty, liability costs, PR to soften bad reviews, lost sales, lost customer goodwill, supporting multiple versions in the field, reseller discounts to keep them selling the product.

Subcategories of external costs are as follows:

- **Investigations** of customer complaints - all expenses related to the investigation and resolving of a customers problem. This may include the need for a field visit.
- **Recall and Retrofit** Costs - all costs required to modify services or products that are updated due to new design changes from original design deficiencies, such as quality problems.
- **Returned Goods** - total cost of surveying, repairing, or replacing products that are not acceptable to the customer. This category does not include the routine costs of maintenance.
- **Warranty Claims** - costs of claims that are paid to the customer due to the acceptance to cover expenses. This includes repair costs as with the need to remove defective hardware.
- **External Appraising** - When field setup is required by the customer prior to official acceptance.

Appraisal Costs are costs involving evaluating a product or service (in stages), from the design to shipping the product, or throughout the process. This evaluation is to determine the conformance and acceptability of products to standards. In other words, it is the cost incurred to determine the degree of conformance to quality requirements (measuring, evaluating or auditing). The

examples are: inspection (incoming and in process), testing, process or service audits, calibration of measuring and test equipment, design reviews, code inspection, Beta testing, test automation, usability testing, pre-release out-of-box testing by customer service staff.

Appraisal costs include the money spent on the actual testing activity. Any and all activities associated with searching for errors in the software and associated product materials falls into this category. This includes all testing: by the developers themselves, by an internal test team, and by an outsourced software test organization. This also includes all associated hardware, software, labor, and other costs. Once a product is in the coding phases, the goal is to do the most effective appraisal job, so that internal failure work is streamlined and well-managed and prevents skyrocketing external failure costs.

Prevention Costs are costs of efforts that are directed to identify and prevent the recurrence of similar problems in products or the processing of goods. These are costs incurred to prevent (keep failure and appraisal cost to a minimum) poor quality, ex: new product review, quality planning, supplier surveys, process reviews, quality improvement teams, education and training.

Prevention costs represent everything a company spends to prevent software errors, documentation errors, and other product-related errors. These include requirements and usability analysis, for example. Dollars spent on prevention costs are the most effective quality dollars, because preventing errors from getting into the product is much cheaper than fixing errors later. If there is an error in a requirement or the intended usability, and money is spent on developing the software to the erroneous requirement, the costs of identifying the error, determining how to fix it, and then developing new code to correct it will arise later.

Subcategories of Prevention Costs are:

- **Product design development** - costs required to interpret and produce the quality standards the customer has specified. It also includes the

management of the quality of new products before release to production. Examples include the need for field trials and design reviews.

- **Marketing** - costs relating to the need to evaluate and understand the customer's needs, such as surveys and market research.
- **Operations**- costs associated with the need to assure the preparedness and capability of the operation to meet with the quality standards. Cost examples include: operator education and training, development of measuring equipment, and quality validation.
- **Administrative** - This includes administrative salaries, performance reporting, education of quality, and audits.

Examples of Prevention Costs are costs of: training, capability studies, quality planning, product reviews, design of experiments, quality improvement teams, staff training, requirements analysis, early prototyping, fault tolerant design, defensive programming, usability analysis, clear specification, accurate internal documentation, pre-purchase evaluation of the reliability of development tools.

All the costs mentioned above can be effectively reduced through smarter test efforts that include a high degree of test automation. Test automation when done right leads to greater test coverage, resulting in higher-quality products. Higher-quality products require less technical support, fewer patches, and lead to greater customer satisfaction. Smarter automated testing also speeds up the release process and incrementally reduces the manual test costs. But most of all, more test coverage gives you and your customers more confidence in your product. You will feel more comfortable knowing that there are not bugs lurking in your software that have not been exposed yet because of insufficient test coverage. You will also not have to scramble at the last minute (typically on the first day of that much-needed vacation), to deal with a problem and fix it to your customer's satisfaction in a rush.

3. Optimizing Quality Cost

The solution to quality cost problems is to get a better understanding of your investment in product quality and manage your costs better. The first place most organizations look for a better understanding is in the highest cost area: the software test effort or lack thereof. For example, if you do not test at all, your testing or appraisal cost is low. You will ship on time but your external failure costs will skyrocket. Your prevention and appraisal costs will result in finding errors that can be corrected while they are still internal failures, where they are cheaper to deal with than when they are external failures.

The goal of understanding quality costs is to analyze where you spend your time and money to get the most bang for the buck. It is well known that it is faster and cheaper to find and fix a bug during unit testing done by developers early in the development cycle. Should we then spend most of our time/budget on unit testing? No. There are many limitations to unit testing. Unit testing is not capable of finding many varieties of bugs, including graphical user interface (GUI) bugs, usability problems, end-to-end bugs, and configuration bugs. For most organizations, getting a better unit test effort will help you release a better product sooner. It is not a replacement for the test effort done by skilled software testers, but it may reduce the time that test effort takes. Understanding quality costs will hopefully help you shift some of your test effort to the most cost-effective places.

In the figure 2, the total quality cost is shown in the upper bathtub-shaped curve. On the bottom axis is the quality of performance, ranging from totally defective to zero defects. On the left axis is the cost per good unit of product. You can see that with highly defective software, your prevention and appraisal costs are very low, but your failure costs are very high, yielding a high total quality cost. With zero defect software, likewise, your failure costs are very low, but your prevention and appraisal costs are very high. To optimize your total quality costs, you want to be between these extremes, at the bottom of the bathtub curve.



Figure 2. Theoretical Model of Optimum Quality Cost

This offers two challenges. First, a sufficiently sophisticated accounting system allowing a typical mid-sized company to track the total cost of quality has yet to be developed. To optimize total quality cost, you need to have the appropriate categories in your accounting system and keep track of the related costs. Second, you need to be able to track your external quality costs. You may not even have enough information from customers on why the software or product is not working for them. How are you going to know what to book into your accounting system for external failure costs? The point here is that while capturing this data is difficult and expensive, you know that the benefit is reducing your overall cost of quality. You need to determine if the benefits of tracking your total quality cost will give you enough of a return on investment to make setting up the appropriate accounting system and paying for the implementation of the program worthwhile.

4. Calculating the Cost and Savings of Six Sigma Quality

One of the most distinct differences between Six Sigma and other quality management systems is the link to business finances. Financial benefits of potential process improvement projects are quantified and used to help select and prioritize process improvement projects. Financial benefits are re-evaluated during the analyze phase to ensure that the cost of improvements suggested will be

supported by the benefit of the project. And finally, the financial benefits are verified once the project enters the control (for DMAIC) and verify (for DMADV) phases.

Once upon a time there was a company who decided to implement Lean Manufacturing. They hired a large prestigious consulting firm who created the grand strategy and trained everyone in lean thinking. Significant operating improvements were identified. It was all documented in a report two inches thick. Teams were launched, a lot of activity took place, and everyone was feeling good about the new initiative. Unfortunately, however, while management appreciated the effort, they were underwhelmed and disenchanted with the teams' bottom-line results. Does this sound like your organization? If it does, you are not alone.

Lean postmortems reveal a familiar root cause for this situation: Organizations are quick to adopt the religion and methodologies of Lean Manufacturing, Six Sigma, and other improvement programs. They also have great intentions as they drive the organization to think about value-added, customer focus, and the need to quantify results. What often gets lost in the excitement of deploying Lean Manufacturing is the discipline involved in tying activities to clearly defined and auditable financial results. A good example of this is the engineer who justifies a major capital investment on a cycle time reduction or labor savings in an area where there is already excess capacity. It's just not real from a bottom-line perspective.

There are several lessons that can be learned about achieving breakthrough results. These lessons work well and help organizations translate transparent intentions into visible financial results.

LESSON 1: Pick Your Battles Carefully

Build a direct link between the Lean Strategy and the daily improvements being pursued by the teams. Make sure that projects pass the litmus test up front in terms of real financial benefits. Finally, don't try to solve "World Hunger" -- use Pareto analysis and chunk off the opportunities with the highest bang for the buck. Keep these initiatives short and focused.

LESSON 2: Hire Your Accountants

Manufacturing often treats these people as public enemy #1 but they understand the bottom-line factors such as revenue dollars, labor rates, gross margins, fixed versus variable costs, inventory costs, variances, G&A expenses, and the like. These measures become critical in translating process improvements into bottom-line results. Teams should be able to relate operational improvements to these P&L and Balance Sheet criteria. The financial organization can add a lot of value in terms of validating benefits.

LESSON 3: Define Project Selection Criteria

Experience shows that documenting and reinforcing financial guidelines early on in the Lean Manufacturing engagement will help standardize expectations about what is or is not a good improvement project. This practice will also help to prioritize actions and how to best use limited resources.

LESSON 4: Use Stage/Phase/Gate Reviews

Every project should have a well-defined implementation plan with timetables, responsibilities, milestones, and deliverables. The worse thing an organization can do is to allow teams to flounder on for months. At a minimum, weekly meetings with a Steering Committee should take place. Make teams accountable for execution and results. If they're not getting it, change the approach. Remember, continuous improvement is not really continuous; it is a series of discrete improvements with well-defined beginning and end points.

LESSON 5: Showcase Results And People

Businesses should create a visible company dashboard or storyboard that outlines the overall Lean strategy, current projects, results-to-date, and recognition for top performers. This builds positive momentum, fosters some healthy competition, and demonstrates that Lean is about generating results for everyone -- the Company, it's customers, employees, suppliers, and other stake-holders. The use of visuals also drives home the fact that Lean Manufacturing is the acceptable standard of conduct. Change is not in addition to your normal job, it is your job

and a condition for employment for everyone. Either we improve or our competition does it for us. You're either part of the solution or part of the problem.

For many organizations, Lean Manufacturing has become a lost opportunity. Management believes in it, their customers are demanding that they do it, but they just can't figure out how to turn actions into cash flow. Management is also questioning why we should continue if we can't see any value or financial impact. It's not the end of the world when organizations have to go back to the drawing board and reconfigure their approach. In fact, the companies who are best at Lean Manufacturing have done this several times. A trip back to the drawing board is a good thing. Stop what isn't working. Return armed with lessons learned and fortified with a renewed perspective from your financial organization. This approach always delivers the real bottom-line results that senior management demands and should expect.

5. Case Studies

For the following three charts, we will discuss how the company is spending their money and how they might improve [1].

CS#1. This company (see figure 3) seems to place too much emphasis on inspection. Looking at the internal costs, this may indicate way. Too many parts are failing, but at least they catch the mistakes before they leave the plant. If more focus is placed on using the data they gather during the appraisal, then they might be able to understand how to prevent similar problems.

CS#2. This company (see figure 4) has a high amount of failure when the product is in the customer's hand. Even though they maybe spending a lot of money on prevention, it might be best if they focused more on appraisal. This will keep the external costs down, and allow for some data to be taken. Even though the internal costs may increase, the information they can gain from the mistakes found will result in ways to improve.

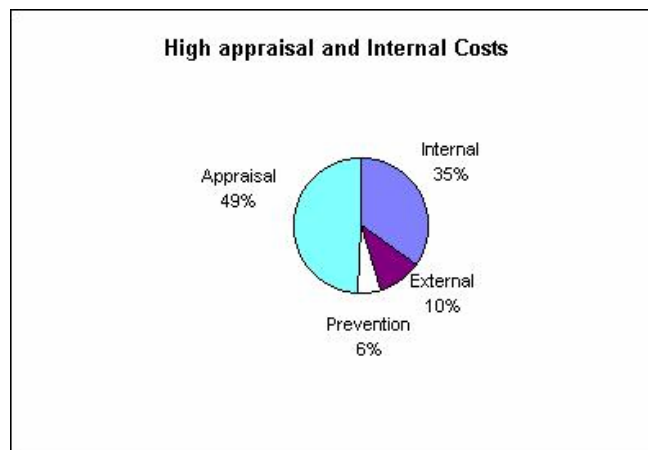


Figure 3. Case study #1

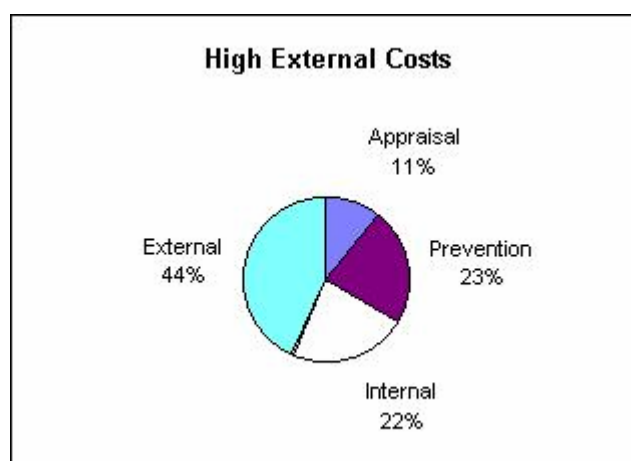


Figure 4. Case study #2.

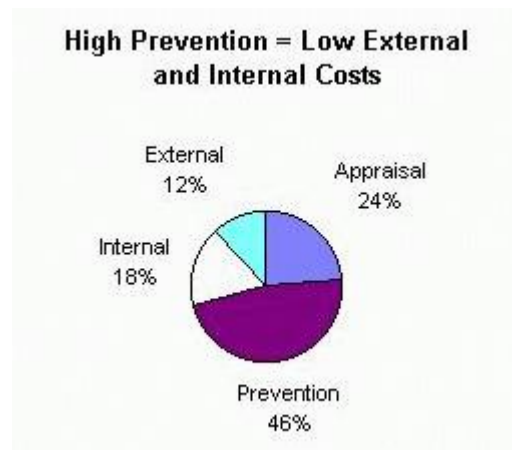


Figure 5. Case study #3.

CS#3. This company (see figure 5) appears to have gained control over their products. Even with some costs in the external and internal failure regions, the overall costs are channelled toward prevention. This company may consider increasing the amount spent on appraisal. This may help to lower the external costs they now have. Internal costs may go up as a result, but it costs less to catch a problem in-house rather than when in the customer's hands.

5. Conclusion

Taking the time to better understand your quality costs will help you to much more cost effectively deliver a quality product or service. You will be able to optimize the various costs to achieve the best quality achievable at a more reasonable price.

Reference

http://www.logigear.com/newsletter/understanding_quality_cost.asp

Module 5. Lesson 14. The Impact of Business Excellence on Financial Performance⁸

1. Introduction

The term Business Excellence is often used to describe the EFQM Excellence Model and other approaches, such as 'TQM', that aim to improve an organization's performance. All such approaches are based on the Excellence Model premise that *excellent results with respect to Performance, Customers, People and Society are achieved through Leadership driving Policy and Strategy that is delivered through People, Partnerships and Resources, and Processes.*

2. Why is there controversy about whether Business Excellence works?

There are a number of reasons why people, particularly senior executives, question whether the Excellence Model works, but the main one is lack of evidence, and the controversy has undoubtedly been fuelled by the fairly inept case offered by the proponents of Business Excellence, particularly their inability to provide hard facts to show that it works.

Furthermore, while there is no question that there are organizations that have benefited immensely from successful implementations of Business Excellence - examples in the UK include UK Business Excellence Award winners such as Rolls-Royce, Siemens and TNT or Baldrige winners such as Motorola, Federal Express and Solectron in the USA - even here much of the evidence presented is anecdotal and rarely accounts for the fact that performance improvements could also be influenced by other factors such as industry and the economy.

3. Resolving the Controversy

⁸ Based on The British Quality Foundation White Paper
(http://www.saferpak.com/business_excellence.htm)

There are two basic issues:

- The controversy is based more on anecdotes, impressions, and opinions, and less on what one would consider to be scientific and objective evidence. The arguments advanced by both the detractors and proponents of Business Excellence do not stand up to the standards of scientific evidence.
- Organizations that have already invested in Business Excellence would like to know whether they have made the right decisions and whether they should continue investing, while others are not investing because of the controversy about its value.

The only way to resolve the controversy is to use objective and verifiable data to examine the strength of the relationship between Business Excellence and financial performance. Any attempt to establish the link between Business Excellence and financial performance had to focus on firms that had implemented Business Excellence effectively and the winning of quality awards can be used as a proxy for effective implementation.

4. Technical points about the research

Choosing when to begin measuring the performance and over what time period the performance should be measured are critical issues when linking improvement initiatives and approaches to financial performance. Hendricks and Singhal examined performance over two five-year periods. The first period - the post-implementation period - started one year before and ended four years after the date a winner won their first quality award, on the basis that winners have a reasonably effective Business Excellence implementation by that time. They assumed that a winner's Business Excellence implementation was effective about a year before the date of winning the first award and that examining performance from this point provided an estimate of the financial impact of Business Excellence implementations once they are effective.

The second period - the implementation period - started six years before

and ended one year before the date the winners won their first quality award on the basis that it is during this time period that winners are implementing their improvement programmes.

To avoid biases associated with asking winners to self-judge the impact of Business Excellence, the sample of winners was restricted to include only publicly traded firms. This allowed the use of objective and historic financial data as far back as necessary. The final sample consisted of 600 winners of independent or customer awards. (The Baldrige award in the USA and the BQF's UK Business Excellence Awards are examples of independent awards, while the XYZ company best supplier award is an example of a customer award.)

Benchmarks were required to adjust the performance of companies for the relevant industry and economic influences. Stock market portfolios such as the S&P 500 were used to benchmark the share price performance of award winners. For the other performance variables, a sample of 10 benchmark firms was generated by matching each award winner to a benchmark firm of similar size from the same industry.

5. Results for the implementation period

No significant differences between the performance of winners and benchmarks were observed during the implementation period. This is of the utmost importance. We are not talking about firms that were already ahead of the pack. On the contrary, while they were implementing Business Excellence, they were performing no better than their peers.

6. Share price performance of award winners during the post-implementation period

Results for the post-implementation period indicate that quality award winners outperformed the benchmarks on almost every performance measure. Figure 1 compares the share price performance of award winners against the

various benchmark portfolios using the following process.

For each award winner, a hypothetical \$100 is invested in the winner's shares one year prior to the date of winning their first quality award. At the same time, an equal amount is also invested in a benchmark portfolio. Both investment strategies are tracked for the next five years. At the end of five years the average share price return from holding the shares of the award winners is compared with the average returns from investing in the benchmark portfolio.

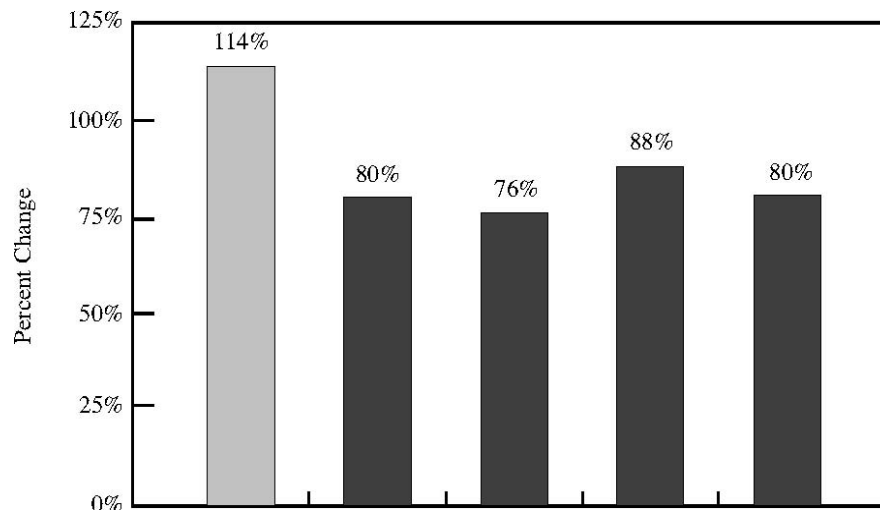


Figure 1. Comparison of the post-implementation period share price performance of award winners and various benchmarks

The share prices of award winners increased by an average of 114% over the five-year period. Over this same time period an alternative strategy of investing a similar amount in the S&P 500 Index and holding it over the same time period would have resulted in an 80% return. The difference of 34% is a statistically and economically significant level of outperformance that translates to an average market value creation of an extra \$669 million. The chance of observing the difference of 34% purely by luck is about 1 in 150. In summary, the overall evidence indicates that firms that have an effective improvement programme do better in terms of share price performance when compared to appropriate benchmarks. Furthermore, as is shown in Figure 2, performance improves over time, confirming that Business Excellence is not a quick fix but a long term

investment.

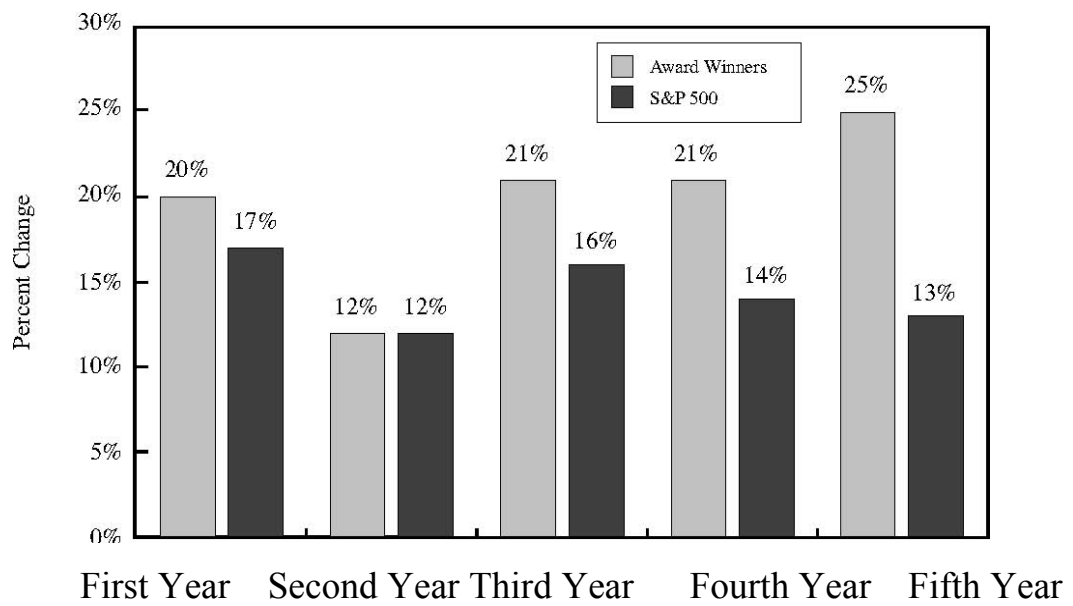


Figure 2 Annual comparison of the post-implementation period’s share price performance of award winners against the S&P 500

7. Performance and Productivity

When we look at a range of measures that are typically used to assess the performance and productivity of companies, we find that award winners outperform the average firms by impressive margins (see fig.3).

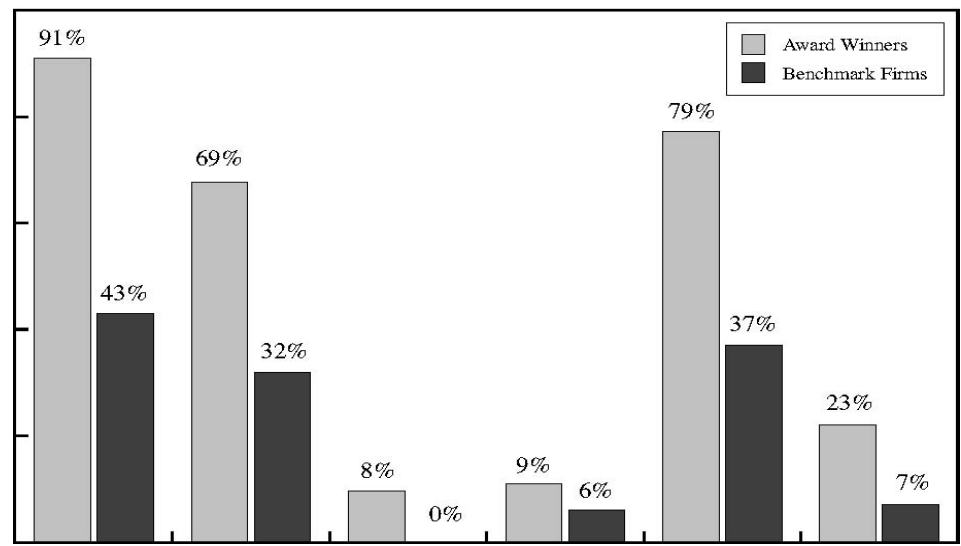


Figure 3 Performance and productivity of award winning firms in the post-implementation period

The differences are striking. Operating income for award winners increased by an average of 91% over the post-implementation period. This is in contrast to an average 43% increase over the same time period for the benchmark firms. The difference of 48% is a statistically and economically significant level of outperformance. The chance of observing this difference in operating profit purely by luck is about 1 out of 200.

Award winners also experienced higher growth as compared to the benchmark firms. Winners increased sales by 69% (compared to 32% for the benchmarks), increased total assets by 79% (compared to 37% for the benchmarks), and increased the number of employees by 23% (compared to 7% for the benchmarks). Winners also showed higher improvement in productivity and efficiency measures. The return on sales improved by 8% compared to no improvement for the benchmarks, and the return on assets improved by 9% compared to 6% for the benchmarks. These results clearly indicate that Business Excellence improves profitability, leads to higher growth, and improves efficiency. Furthermore, they provide additional validity to the winners' share price performance shown in Figures 1 and 2. The improvement in profitability is the reason for the rise in the share prices of award winners.

It is also important to note that the above information is based on a combination of independent and customer awards. The research found that the performance of independent award winners was vastly superior to that of customer award winners, something starkly depicted in Figure 4.

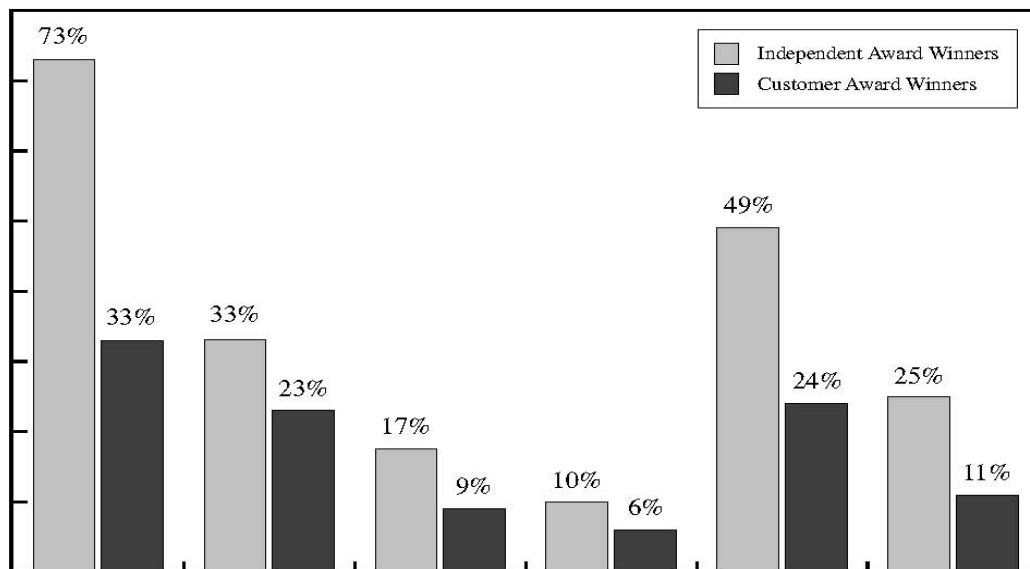


Figure 4. Performance and productivity of independent and customer award winning firms in the post-implementation period.

The cynic will argue that this is bound to be the case, but is that not the point? The organizations that win the Baldrige Award and the UK Business Excellence Award are excellent companies and one of the primary reasons for that is that they apply Business Excellence to an excellent standard.

8. Conclusion

In contrast to the anecdotal and perceptual evidence that has been used by many experts to pass judgement on whether Business Excellence is valuable or not, the evidence provided by Hendricks and Singhal provides a factual, objective, and statistically valid assessment of its impact on financial performance.

However, as the BQF and many others have said repeatedly, firms that want to implement Business Excellence effectively must have patience. It is widely accepted that Business Excellence takes a long time to implement as it requires major changes in culture and employee mindset. This means that the benefits will only be realized in the long run.

Firms should also be realistic about what to expect from Business

Excellence and should not be carried away by the hype. A management system based on Business Excellence can only improve the probability of making the right decisions. It cannot guarantee that all decisions will be right. Furthermore, organizational characteristics such as size, capital intensity, extent of diversification, and the maturity of implementation, all influence the gains. These and other factors should be considered in setting expectations.

Finally, the gains are likely to be tempered by the behavior of competitors. As more and more firms in a particular market segment adopt Business Excellence, the extent of the gains is likely to diminish.

Nevertheless, the overall message is clear. **When Business Excellence is implemented effectively, financial performance improves dramatically.**

Module 5. Topic 15. Just In Time

1. Introduction

The principle of Just in Time (JIT) is to eliminate sources of manufacturing waste by getting right quantity of raw materials and producing the right quantity of products in the right place at the right time.

JIT is a Japanese manufacturing management method developed in 1970s. It was first adopted by Toyota manufacturing plants. Many companies followed up and around mid 1970s' it gained extended support and was widely used by many companies. One motivating reason for developing JIT and some other better production techniques was that after the World War II, Japanese people had a very strong incentive to develop good manufacturing techniques to help them rebuilding the economy. They also had a strong working ethics which was concentrated on work rather than leisure, continuous improvement, life commitment to work, group conscious rather than individualism, and achieving common goals.

After the World War II, Japanese manufacturers looked for a way to gain the most efficient use of limited resources. They worked on "optimal cost/quality relationship". Before the introduction of JIT, there was a lot of manufacturing defects and problems. This included inventory problems, product defects, large lot production and delivery delays. There was a problem of unused accumulated inventory that was not only unproductive, but also required a lot of effort in storing and managing them. Manufacturers knew that a single product defect can destroy the producer's creditability. They wanted to create a "defect-free" manufacturing process. Instead of large lot production, i.e. producing one type of product, they were aware that they should produce more diversified goods. Lastly, the existing system did not manage well for fast delivery request. There was a need to have a faster and reliable delivery system in order to handle customers' needs. Thus, JIT manufacturing management concept was developed based on these problems.

2. Goal of Just in Time

There are three main objectives of the JIT approach:

1. Increasing the organization's ability to compete with others and remain competitive over the long run. The competitiveness of firms is increased by the use of JIT manufacturing process as they can develop a more optimal process for their firms.
2. Increasing efficiency within the production process. Efficiency is obtained through the increase of productivity and decrease of cost.
3. Reducing wasted materials, time and effort. It can help to reduce the costs.

Other short-term and long-term objectives are:

1. To identify and response to consumers needs. Customers' needs and wants seem to be the major focus for business now.
2. Optimal quality/cost relationship. An organization should focus on zero-defect production process. Although it seems to be unrealistic, in the long run, it

will eliminate a huge amount of resources and effort in inspecting, reworking and the production of defected goods.

3. Reduce unwanted wastes. Wastes that do not add value to the products itself should be eliminated.

4. Develop reliable relationship between the suppliers. A good and long-term relationship between the organization and its suppliers helps to manage a more efficient process in inventory management, material management and delivery system. It will also assure that the supply is stable and available when needed.

5. Plant design for maximizing efficiency. The design of the plant is essential in terms of manufacturing efficiency and utility of resources.

6. Adopt the work ethics of Japanese workers for continuous improvement. Commit a long-term continuous improvement throughout the organization. It will help the organization to remain competitive in the long run.

Some other similar ideas presented by other authors are:

1. Reduction of Inventory. JIT reduces inventory at all level of the organization.

2. Reduction of Lead Time. Lead time such as setup time and move time and waiting time is reduced.

3. Quality Control. JIT improves the quality control by increasing its efficiency of managing shop floor production and increasing its commitment to its suppliers.

4. Improvement for Performance. In JIT manufacturing, the organization can obtain a greater impact/control over its suppliers. With fewer suppliers, organizations have larger control because the amount purchased is usually large. And, organizations can obtain a tighter requirement on products from their suppliers.

5. Total Preventive Maintenance. JIT provides preventive maintenance to lessen the risk of machine breakdowns.

6. Continuous Improvement. JIT is a never-ending method in operation management.

7. Strategic Gain. JIT helps organization to remain competitive in the market place.

8. Reduction of Wastes. JIT helps significantly in reducing wastes.

There are seven types of wastes:

- Overproduction wastes – waste from producing too much.
- Waste from waiting time – unproductive waiting time for job processing.
- Waste from transportation – unnecessary movement of jobs.
- Waste from process – unnecessary operation of products.
- Waste from inventory – excess accumulation of products.
- Motion Waste – unnecessary human activity.
- Product defects waste – waste resulted from scrap, rework, etc.

JIT can help organization remain competitive by offering consumers higher quality of products than their competitors, which is very important in the survival in the market place. These major objectives are suitable for all organizations. But each organization is unique in some way, adjustments of JIT objectives for each form should be made in order to complement the overall production process.

3. Elements of JIT

The basic elements of JIT manufacturing are People Involvement, Plants and System.

People Involvement. Maintaining a good support and agreement from people involved in production. This is not only to reduce the time and effort in implementation of JIT, but also to minimize the chance of creating implementation problem. The attempt to maximize people's involvement may be carried through the introduction of quality circles and total involvement concept. Manufacturers can gain support from 4 sources:

1. Stockholders and owners of the company; we should maintain a good long-term relationship among them.

2. Labor organization - all labors should be well-informed about the goals of JIT, this is crucial in gaining support from them.

3. Management support - support from all level of management. The ideas of continuous improvement should spread all over the factory, managers and all shop-floor labor.

4. Governmental support - government can show their support by extending tax and other financial help. This can enhance the motivation, and also help in financing the implementation of JIT.

Plants. Certain requirements are needed to be met to implement JIT. They are:

1. Plant layout - the plant layout is mainly focused on maximizing working flexibility. It requires the use of "multi-function workers".

2. Demand pull production - it means to produce when the order is received. This can manage the quantity and time more appropriately.

3. Kanban - a Japanese term for a card or tag. Special inventory and process information is written on the card. This helps tying and linking the process more efficiently.

4. Self-inspection - it is carried out by the workers and allows to catch mistakes immediately.

5. Continuous improvement - this concept should be adopted by every member in the organization in order to carry out JIT. This is the most important concept of JIT. This can allow an organization to improve its productivity, service, operation and even customer satisfaction in an on-going basis.

System. This refers to the technology and process that combines different processes and activities together. The two major types are MRP (Material Requirement Planning) and MRP II (Manufacturing Resource Planning). MRP is a computer-based, bottom-up manufacturing approach. This involves two plans, a Production plan and a Master production schedule. The Production plan involves management and planning of resources through the available capacity. Master production schedule involves what products are to be produced in what time. MRP

II is mainly involved in management or planning of financial resources in order to carry out the operation.

4. Introducing JIT

The introductory phase of JIT involves 5 steps.

Step 1: Awareness Revolution. It means giving up old concept of managing and adopting the JIT way of thinking. There are 10 principles for improvement:

1. Abolish old tradition concepts.
2. Assume that new method will work.
3. No excuse is accepted.
4. It is not seeking for perfection, absolutely zero-defect process, few defects is acceptable.
5. Correct mistakes immediately.
6. Do not spend money on improvement.
7. Use you brain to solve problem.
8. Repeat to ask yourself 5 times before any decision.
9. Gather information from several people, more is better!
10. Remember that improvement has no limits.

The idea of giving up old concept was especially for the large lot production. The lot production presumed that "having fewer changes is better", but it was no longer true. The JIT is a one-piece flow manufacturing. So, the idea is:

- Lot production: "Unneeded goods...In unneeded quantities...At unneeded times..."
- JIT: "Needed goods...In needed quantities...At needed times..."

Step 2: 5S's For Workplace Improvement. This 5S's should be implemented company-wide and be a part of a total improvement program. The 5S's stand for:

- Seiri - Proper Arrangement. It means sorting what you have, identifying the needs and throwing out those unnecessary. One example is using red-tags.

This is a little red-bordered paper saying what the production is, how many are accumulated and then stick these red tags onto every box of inventory. It enhances the easiness to know the inventory status and can reduce cost.

- Seiton – Orderliness. Orderliness means making thing in order. Examples include keeping shelves in order, keeping storage areas in order, keeping workplace in order, keeping worktables in order and keeping the office in order.
- Seiso – Cleanliness. Cleanliness means having a clean workplace, equipment, etc.
- Seiketsu – Cleanup. Cleanup means maintaining equipment and tools.
- Shitsuke – Discipline. Discipline means following the rules and making them a habit.

Step 3: Flow Manufacturing. Flow manufacturing means producing one single piece of product at a time but multi-handling which follows the process sequence. There are several main points concerning flow manufacturing:

- Arrange machines in sequence.
- U-shaped production line (Cellular Manufacturing).
- Produce one-piece at a time.
- Train workers to be multi-skilled.
- Follow the cycle time.
- Let the workers standing and walking around while working.
- Use small and dedicated machines.

Step 4: Standard Operations. Standard Operation means to produce quality safely and less expensively through efficient rules and methods of arranging people, products and machines. The basis for standard operations are:

- a) Cycle time. It means how long it would take to "carry out part all the way through the cell". $\text{Cycle Time} = \text{Working Hours per day} / \text{Daily Quantity Required}$.
- b) Work sequence
- c) Standard stock-on-hand
- d) Use operation charts.

Step 5: Multi-Process Handling. Multi-process handling means one worker is responsible for several processes in a cell. There are some points that we should be aware of:

- Clearly assign jobs to machines and workers.
- Make a good use of U-shaped cell manufacturing.
- Multi-skilled workers.
- Operators should be able to perform multi-machine handling and multi process handling. (Multi-machine handling - a worker should handle several machines at once, this is also called "horizontal handling". Multi-process handling - a worker should handle several different processes at once, this is also called "vertical handling" and this is the basis for JIT production.)
- Uses casters extensively ("Floor bolts are our enemies! Machines must be movable").

The above listed 5 steps are the basis for introducing JIT. Only after these steps are completed can JIT be implemented.

5. Limitations of Just in Time

Regardless of the great benefits of JIT, it has its limitations. The following major limitations are:

Culture Differences. The organizational cultures vary from firm to firm. There are some cultures that tie to JIT success but it is difficult for an organization to change its cultures within a short time.

Traditional Approach. The traditional approach in manufacturing is to store up a large amount of inventory for backing up during bad time. Companies that rely on safety stocks may have problems with introducing JIT.

Difference in implementation of JIT. JIT approach was originally developed in Japan, It is sometimes difficult for implementing companies in western countries.

Loss of individual autonomy. This is mainly due to the shorter cycle times which add pressures and stress on the workers.

Loss of team autonomy. This is the result of decreasing buffer inventories which lead to a lower flexibility of workers to solve problems individually.

Loss of method autonomy. It means that workers must act some way when problems occur, This approach does not allow them to have their own method to solve a problem.

Resistance to change. JIT involves a change throughout the whole organization, but human nature resists to changes.

Some other limitations are:

- *Relationship between management and employees.* Mutual trust must be built between management and employees in order to have effective decision making.
- *Employee commitment.* Employees must commit to JIT, to enhance the quality as their ultimate goal, and to see JIT as a way to compete rather than method used by managers to increase their workload.
- *Production level.* JIT works best for medium to high range of production volume.
- *Employee skills.* JIT requires workers to be multi-skilled and flexible to change.
- *Compensation.* Compensation should be set on time-based wages. This allows the workers to concentrate on building what the customers wants.

6. Effect of JIT

We will now consider the effect of JIT purchasing relationships on Organizational Design, Purchasing Department Configuration, and Firm Performance. JIT purchasing requires close relationship and co-operation on product development and specification (product and information flow). It also

involves joint product design, extensive verification of supplier quality and shared production plan. Three questions are to be addressed in this context:

1. Is JIT purchasing associated with overall organizational design?
2. Is JIT purchasing associated with the configuration of purchasing?
3. Is JIT purchasing associated with performance?

To answer these questions, we have to first look at the factors that are related to each of the question. In consideration of the overall organizational design, four different aspects are discussed: formalization, decentralization, integration and specialization.

Formalization refers to formal internal performance control, formal benchmark control and the strategic formalization of the purchasing function. It is found that the more JIT purchasing, the more internal and benchmark control are implemented. The reasons for that are:

- 1) JIT represents the exact process management, so more performance information is needed to ensure that the remaining inventory meets the specification.
- 2) JIT provides feedback which is essential to the success of JIT implementation.
- 3) With the increase of JIT purchasing, a written statement of shared vision (goal) of the firm is needed.

Decentralization consists of line-operating decision and scheduling. JIT purchasing is related to decentralized decision-making because higher employees involvement will result in higher performance. JIT purchasing is positively related to line-operating and negatively related to scheduling.

Specialization focuses on division of labor. If there is more JIT purchasing, more labor is needed to perform a faster production schedule. So, it is positively related to JIT. It is obvious that JIT purchasing is associated with the overall organizational design.

To address the second question, we have to look into two aspects. They are the number of layers for the purchasing function and the span of control of the

senior purchasing executive. It was found out that JIT purchasing is negatively related to the number of layers for the purchasing function and positively related to the senior purchasing executive's span of control.

As for the third question - Is JIT purchasing associated with performance? JIT is expected to be related with efficiency, financial performance and market performance. And it was found out that JIT is negatively related to weeks of inbound inventory, positively related to financial performance and market performance.

Reference:

<http://members.tripod.com/tejc/jit.htm>

Module 5. Topic 16. Process Mapping

1. Introduction

Process mapping is the step-by-step description of the actions taken by workers as they use a specific set of inputs to produce a defined set of outputs. The resulting process maps depict the inputs, the performers, the sequence of actions the performers take, and the outputs of a work process in a matrix or flowchart format, usually combining both words and simple graphics. The maps may also include the elapsed time required to perform each step, the feedback the performers receive, conditions of work, consequences, and other elements. Process mapping is also known as system task analysis, process task analysis, process diagramming, and work mapping. Figure 1 shows a simplified example of a process map for catalog orders.

Catalog Telephone Order Process

Performer	Process Steps				
Customer	1. Calls service center and is routed to first available associate.	2. Tells associate the catalog numbers of items selected.			
Sales Associate		3. Enters order into computer system as customer talks.			
Picker		4. Receives batch of orders with item numbers via computer.	5. Fills each order by picking items from warehouse shelves and placing in tub.	6. When has picked 25 orders, brings them to packing.	7. Enters the 25 order completions in computer.
Packer					8. Packs and labels each order and delivers to shipping.
Shipper					9. Enters orders as "shipped" in computer and loads on truck.

Figure 1. Simplified Example of a Process Map.

Depending on the span of the process of interest, a process map may focus on an entire organization, a business unit, a division, a function, a work group, or even an individual performer. If the process involves a complex entity such as a business unit, a series of maps may be produced beginning at the highest level, for example, the business unit, and then proceeding to lower levels such as division and work group.

2. Applications of Process Mapping in Performance Technology

Process mapping can be a powerful tool for both identifying *performance improvement needs* and determining the underlying *causes of performance problems*. Once a process is mapped, it is easy to spot redundancies, omissions, insufficient work support, ineffective communication and workflow, and other obstacles that impede the performance of work. For example, when my team mapped a civil service examination appeals process that involved six employees, we noticed that the same appeal returned to the desk of four of the employees at least three times in the course of the process. The repetitive workflow was clearly an obstacle to efficient resolution of the appeals.

Process mapping can be an excellent data collection method for identifying *job duties and tasks* because in defining a work process we are describing the specific actions each person takes. It also offers a systemic view of work, so we see each employee's work in the context of the complete workflow and interactions with others rather than only studying the work of one person at a time

Process mapping can also provide an efficient technique of data collection for *competency modeling*. Each element described in the process map can be used as a framework for competency identification. After the process map is completed, a small group of top performers identifies the competencies needed for each element (e.g., inputs, process steps, feedback). For example, for each process step, the performers name the competencies they need to successfully execute that step.

A process map can also be an excellent approach to identifying the *content* that should be included in an instructional course, manual, or job aid intended to help workers execute a process. The detailed step-by-step descriptions included in process maps provide a clear and concise blueprint for content. As a quick overview of a process, the maps also provide a handy job aid for employees.

For organizational development initiatives such as business process improvement, workflow designs, or reorganizations, process mapping offers an excellent approach to understanding the *current "as is" state* and a detailed, visual guide to areas for improvement. As the project continues through the design stage, process mapping can be used to develop a prototype of the re-design and check its effectiveness.

Many people in organizations find it easier to understand performance problems and their consequences when they see a visual depiction. The data collected in process maps are often more compelling to executives and managers, for example, than a narrative report or an oral presentation. They often seem to more quickly grasp the nature of performance challenges and their negative impact when they see a process map.

After an intervention involving organizational design is implemented, process mapping can provide a helpful method for *evaluating the effectiveness* of

both the design and its execution. It provides data on how the design is actually being implemented and identifies both successes and problem areas. Process mapping can be a good data collection tool for before/after evaluation designs: the target work process is mapped before and after design and the maps are compared for efficiency and effectiveness of process execution.

As a method of data collection, process mapping has both advantages and disadvantages. The advantages of the method are:

- Process mapping helps the performance technologist develop a systems view of a situation, because the map highlights the interactions of several individuals or work groups and how the work of one entity is affected by the work of another.
- Creating the maps guides one through a thorough step-by-step appraisal of a performance situation.
- The mapping technique can be adapted to studying the work of entire organizations or business units, functions, work groups, or individuals.
- As much or as little detail as is needed for decision making can be collected.
- Process mapping requires a small investment of time and employee involvement in order to collect a large amount of valuable data.
- Employees are usually very comfortable describing their work processes and do not hesitate to provide candid information.
- Completed process maps can also serve as effective educational and communication tools.
- Process mapping provides straightforward data that require little or no interpretation.

The disadvantages of this method are:

- Process mapping typically is based on input from only a small group of employees. However, wider input can be achieved by circulating the draft map to a larger group for review and feedback.
- It requires a high level of facilitation skill to guide a group through the process mapping exercise.

- Persons who do not like working with detail can find it very difficult to sit for the time usually required to create a process map.
- As with most data collection methods, the quality of the data collected depends heavily on the accuracy of the information provided by participating employees.

3. Guidelines for Process Mapping

Plan. The first step is to clearly define the process to be mapped; then designate the boundaries of the process. What are the triggers that begin the process? What are the outputs or consequences that end the process? The next step is to determine the organizational levels to be included in the process map. Is this a process that cuts across business units, or is it confined to a single business unit? Does the process involve several functions or just one? How many work groups are involved?

Another important and difficult issue is to determine the level of detail that will be included in the process map. For example, will only key process steps be included, or will specific tasks within steps also be portrayed? Will individual assignments be noted or just overall work group responsibilities? The process elements to be described in the map must also be defined. Process inputs, outputs, action steps, and performers should be included in all process maps. Optional elements include the time required to complete each step, feedback to the performer, consequences of the outputs, work environment, and other attributes of the process.

The media and format used to create the process map also require planning. Will a computer software program or a manual process be employed? Will the map be formatted using a simple matrix or a complex workflow diagram with different symbols for activities, inputs/outputs, decisions, connecting points, storage places, etc.? Also important in ensuring success is planning the logistics of the process mapping session such as meeting rooms, food (it is a lot easier to keep people in a

room for several hours if they are fed), mapping materials (e.g., wall-size mapping paper, markers, adhesive notes), and computers.

The Process Mapping Team. It is important to carefully select the people who will form the process mapping team. The team should include the process owner, the individual with overall responsibility for the routine management of the process, and the employees who play key roles in the process. If many employees participate in the process, it will be necessary to select a representative from each work group. It is usually best to limit the team to eight to ten people to keep the process manageable.

The Session. There are several different approaches that may be used in process mapping. The steps below describe one manual approach using a matrix format; the key tasks of identifying work groups and process steps are the same for both manual and computer-based methods.

1. Before the session begins, prepare the mapping paper. Tape a roll of paper about five feet wide and 10 feet long to a wall. With a black marking pen, draw a vertical line down the entire width of the paper about 12 inches from the left margin. Draw nine horizontal lines across the entire length of the paper about six inches apart. Write “Work Groups” (or another entity you have chosen for the assignment of process steps) at the top of the first, narrow column. Write “Process Steps” in the middle of the second, wide column.

2. When the team assembles, begin with a quick review of the mapping process, and then reach consensus on the work groups or other entities involved in the process. Write the name of each entity in one of the cells in the first column on the mapping paper.

3. Lead the team through identifying each step in the process. As each step is identified, write it on an adhesive note and place the note in the row of the entity that performs that step. Use different colors of notes to indicate small differences in process steps. For example, for some processes there may be different steps for hourly and salaried employees. In this case, yellow notes could be used for hourly employees, blue for salaried employees, and green for all employees. (Note: If the

process varies significantly for different employee populations or situations, it is best to create separate maps for the different situations.)

4. When all process steps have been agreed on and placed on the map, walk through the map step by step and discuss any changes or additions that need to be made. Rearrange, add, or discard the adhesive notes as needed.

5. Review the revised map again with the team and make any further changes or additions.

6. Number the steps by placing sequential numbers in the upper right-hand corner of each note. If steps occur concurrently, assign them the same number and add a lower case alphabetic letter, e.g., 2a, 2b, 2c.

7. Assign each work group an upper-case alphabetic letter and write the letter in the work group's cell in the first column. For each process step, identify the work group that performs the step by writing the work group letter in the lower left-hand corner of each note. (This lettering helps identify the proper work group in the event that the note comes loose from the map.)

8. Before the team adjourns, review all acronyms, abbreviations, or special terms written on the notes to ensure they are understood by all and consistently used.

9. Tape each note to the mapping paper.

10. Immediately after the mapping session, the facilitator should transfer the information on the paper map into a table within a word processing or spreadsheet program to create an electronic version of the map.

Reviewing and Revising the Process Map. Distribute copies of the map to the team for individual review. Meet briefly to confirm that the process was accurately captured and note any changes that need to be made. Make any changes needed, and then distribute the revised map to a larger group for review. This is an opportunity to solicit input from many people who participate in the process. Use the feedback received to revise the process map as needed. It is now ready for use in the chosen application.

4. Constructing a Process Flowchart

Step 1: Determine the Boundaries. Where does a process begin? Where does a process end?

Step 2: List the Steps. Use a verb to start the task description. The flowchart can either show the sufficient information to understand the general process flow or detail every finite action and decision point.

Step 3: Sequence the Steps. Use post-it notes so you can move tasks. Do not draw arrows until later.

Step 4: Draw Appropriate Symbols. Start with the basic symbols: *ovals* show input to start the process or output at the end of the process, *boxes* or rectangles show task or activity performed in the process, *arrows* show process direction flow, *diamonds* show points in the process where a yes/no questions are asked or a decision is required.

Usually there is only one arrow out of an activity box. If there is more than one arrow, you may need a decision diamond. If there are feedback arrows, make sure feedback loop is closed; i.e. it should take you back to the input box.

Step 5: System Model. Draw charts using system model approach:

- Input - use information based upon people, machines, material, method, and environment.
- Process - use subsets of processes in series or parallel.
- Output - use outcomes or desired results.
- Control - use best in class business rules.
- Feedback - use information from surveys or feedback.

Step 6: Check for Completeness. Include pertinent chart information, using title and date for easy reference.

Step 7: Finalize the Flowchart. Ask if this process is being run the way it should be. Are people following the process as charted? Do we have a consensus? What is redundant; add what is missing.

The purpose of process mapping is to use diagramming to understand the process we currently use and ask what is expected of us; what should we be doing

to provide better customer focus and satisfaction. It will identify what best practices we need to incorporate and find appropriate benchmarks for measuring how we can arrive at better ways of communicating our services. A sample Flowchart is shown in the figure 2.

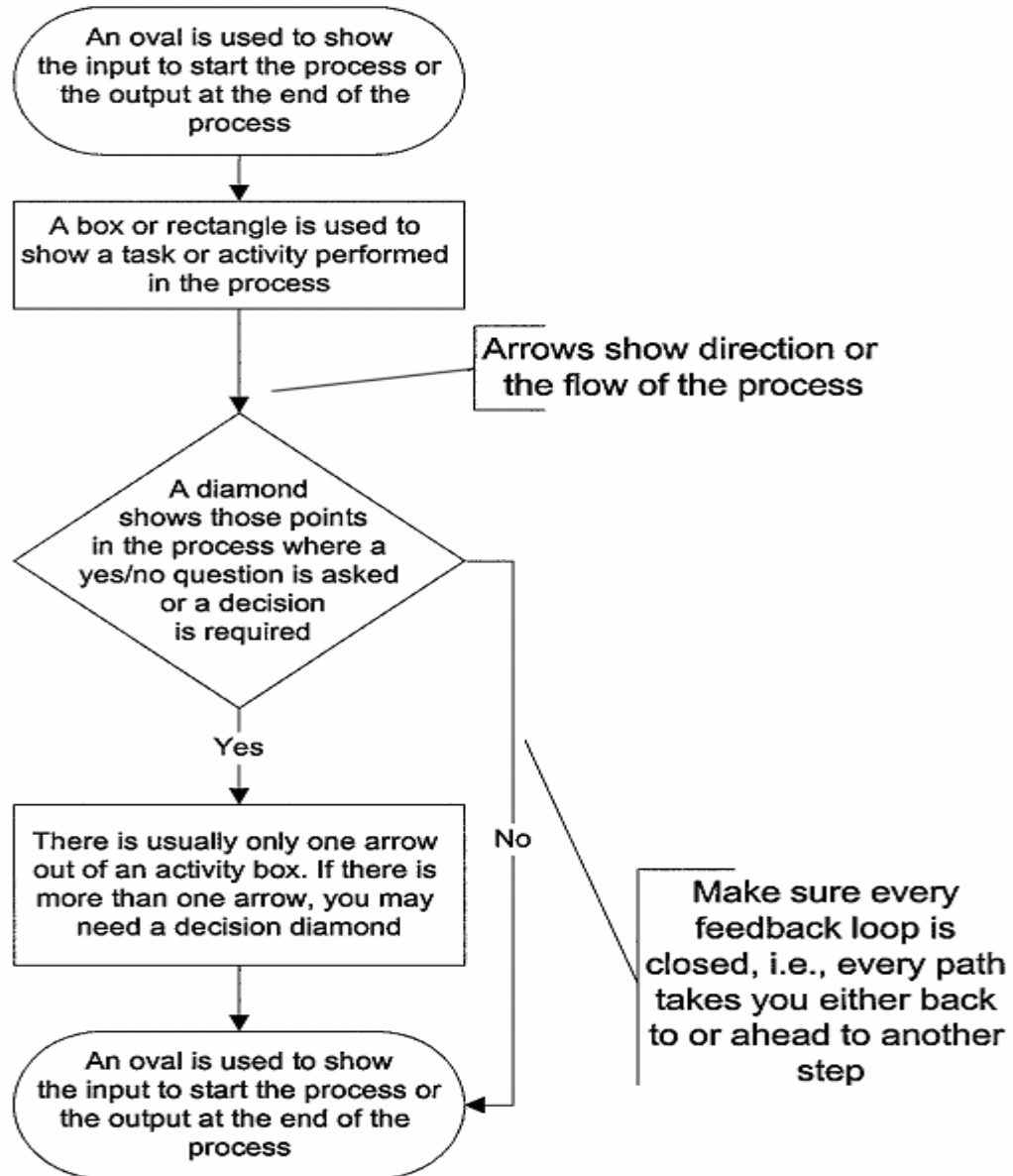


Figure 2. Sample Flowchart

References

1. Langdon, D. (1999). Process mapping. In D. Langdon, K. Whiteside, & M. McKenna (Eds.), *Intervention resource guide* (pp. 311-317). San Francisco: Jossey-Bass/Pfeiffer.
2. www.ispi.org

Module 6. Topic 17. Policy Deployment

1. Introduction

“Policy Deployment” refers to methods used to be sure that everyone in the enterprise is working effectively towards the same ends. Efficient deployment of policies requires not only that the policies be communicated without ambiguity, but also that the policies be workable and understandable by those who are to carry them out. It is not enough that a policy be written in clear, understandable language. What is clear and understandable to one person is not always clear and understandable to another. Effective policy deployment requires that communications be tested for comprehension.

In addition to testing the communications, the policies themselves should be tested to see that they are workable and that they make sense to those who are to carry them out. This step is often neglected. Policy makers often believe that their job is finished when they have announced a clearly stated policy. In fact, when the policy is announced, the job has barely begun.

Definition. Policy Deployment is the rationale upon which the methods are based. It consists of two hypotheses:

- You do not know how someone else has understood what you have told them until you see how they interpret your statements to someone else.
- The spoken word is inadequate for policy deployment. Policies must be written if the communication of policy and the policy itself are to be tested.

The basic question attacked by policy deployment is: Does the policy statement make sense to those who are to act upon it and are they able and willing to carry it out?

2. Processes used to inform people about policy decisions

Figure 1, below, depicts the normal approach to policy deployment. We call

it the “broadcast” approach. The CEO develops a policy statement and broadcasts it to the troops. (“Now hear this”).

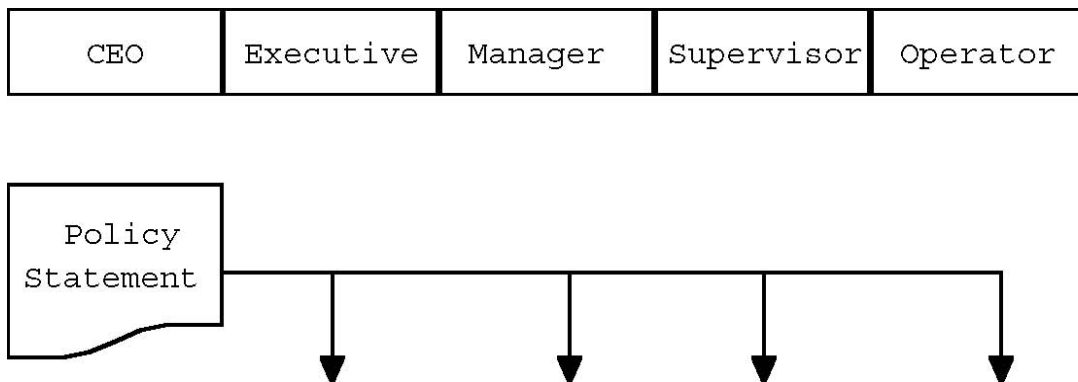


Figure 1. The “Broadcasting” of policy.

Sometimes the broadcast is made via videotape and is followed up with general meetings at which the audience is encouraged to question the speaker. Broadcasting makes the executive feel that he or she is demonstrating an enlightened spirit of communication. The group meetings encourage people to express their opinions, but the setting does not provide useful feedback. The executive does not learn what the people intend to do about the new policy, if they really understand it and whether what they will do is what is desired.

As an alternative to broadcasting, the CEO or some other executive announces the policy and each manager interprets the policy (or sometimes merely passes it along) until the policy arrives at the place where something is to be done. This process is described in figure 2.

The weakness in the process shown in figure 2 is that there is also no feedback. The person who has announced the policy will not learn what problems were generated by the process until much later. In some cases the leader will never learn what went wrong but will merely issue another policy.

In figure 3, below, we show an improvement in the process. In this case at each level the manager and subordinate meet to discuss the policy statement. The subordinate has prepared an interpretation of the policy statement which both persons have read ahead of time. If there are differences in the interpretation, the

two can discuss the reasons for the differences.

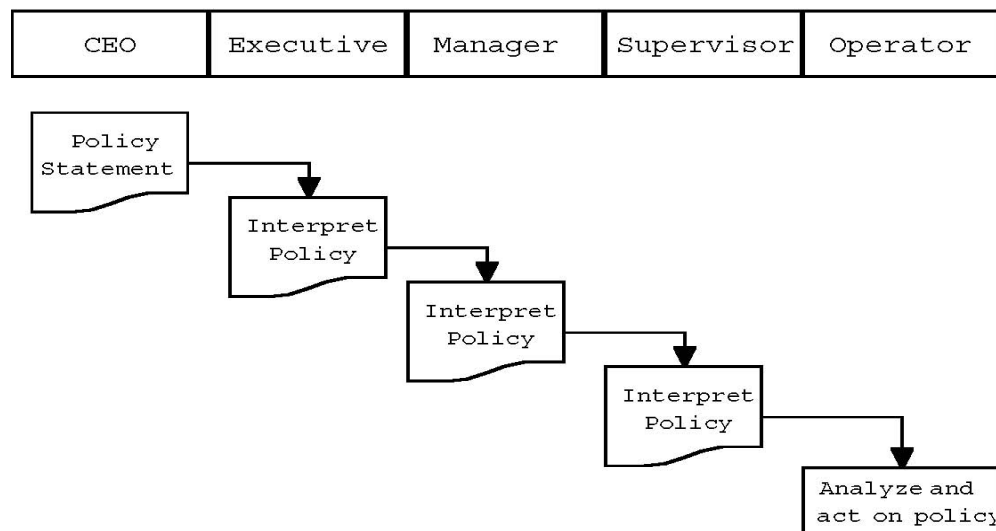


Figure 2. Policy Deployment by “pass it along”.

There are several reasons why their interpretations may differ.

1. The policy statement is ambiguous to the person interpreting it.
2. The person interpreting the policy faces difficulties not foreseen by the person who wrote the policy (or its interpretation).
3. The person who is to act upon the policy does not know how to do so but is not able to explain why.
4. The person who is to interpret the policy knows something the policymaker does not know.

While the figure 3 represents an improvement, it still is not adequate for improving the policy deployment process. Many managers will feel that the process shown is too complicated. They will think that a simple problem of communication has been made much too complex. It is true that it takes more time to conduct the process shown in figure 3 than to just broadcast a policy statement as shown in figure 1. However, if the original dissemination of policy is inadequate, the amount of time the executives will spend trying to correct the situation is much greater than the time required to do it right the first time.

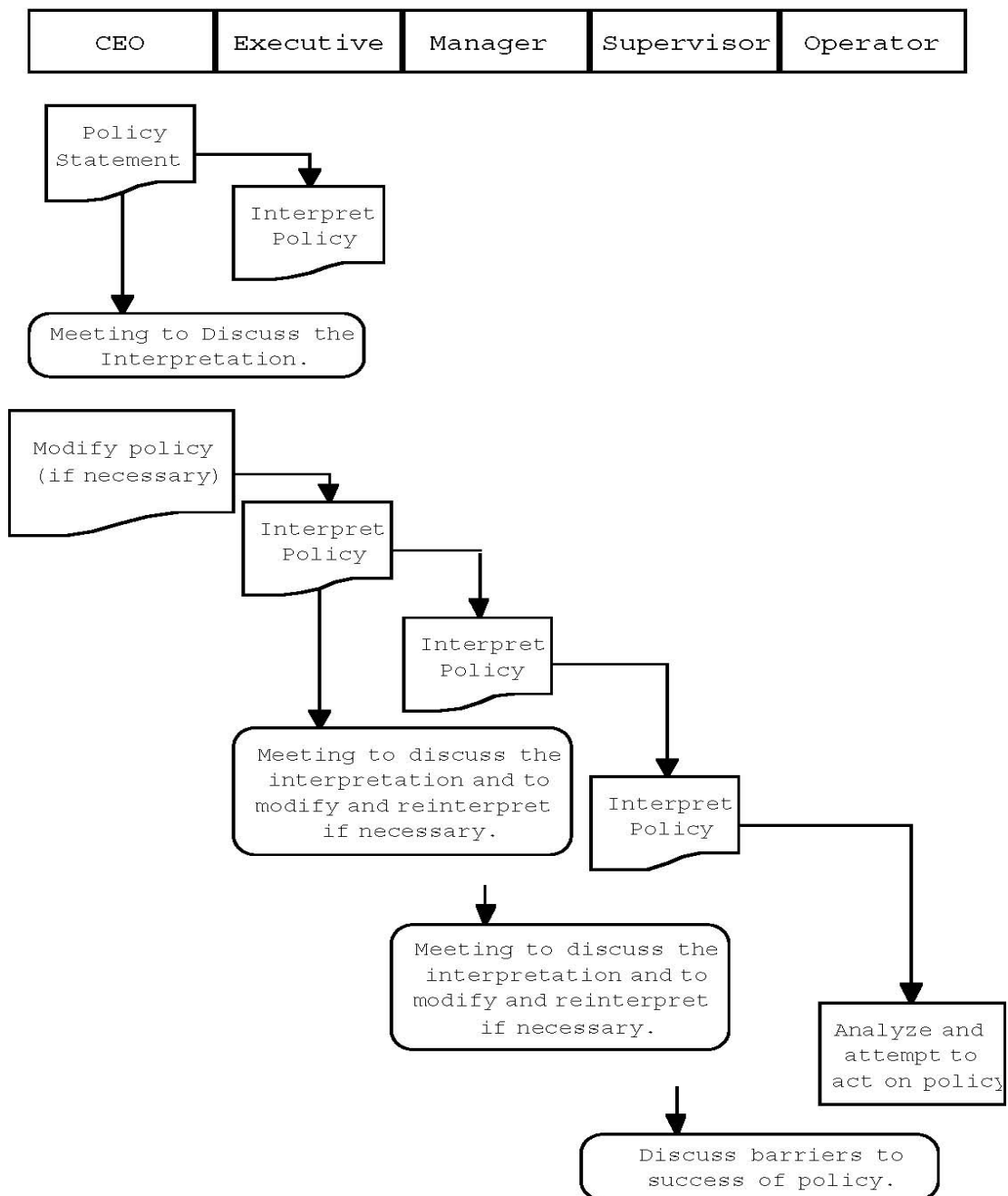


Figure 3. An improved approach to policy deployment.

3. What should a Policy Statement contain?

It is useful to divide policy statements into two categories. Some statements of policy are meant as guides for routine decision making. Policies regarding sick leave, education, vacation, pensions, etc., fall in this category. Other statements are intended to improve the company situation. This lesson is concerned only with the

second category. It is understood that the purpose of the policy statements we are discussing is improvement.

A policy statement should be explicit regarding:

- a. What is to be improved.
- b. Why it is to be improved.
- c. How improvement will be measured.
- d. The time frame in which the improvement should be made.
- e. A target for accomplishment.

A policy statement which originates at the top of an enterprise will necessarily be fairly general. As the statement is interpreted down the hierarchy, it should become progressively more and more explicit. At the lowest level the policy statement should become a specific plan or a strategy for taking action. The degree to which the lower level statements can be explicit will depend upon the task.

It is well to remember the distinction between a “strategy” and a “plan” as described by Bill Golomski:

PLAN. When you know what you want to do and you know precisely how to do it, you may develop a plan by starting at the end state. Knowing, for example, that you have to produce a report on a certain date, you can work backwards, allowing for the time it takes to produce the report to the date at which all the information for the report has to be ready. Then, knowing that date, you can allow for the time it takes to produce the data to find the time at which you should start to take data. Knowing how long it takes to get the equipment ready and calibrated, you can determine the date upon which the equipment must have been delivered. In this fashion you can work backwards from the final date to the date upon which you must start. In a plan, each step is taken with full knowledge of what will be done at the next step. A plan is developed by working backwards from the final stage to the start.

STRATEGY. When you know what you want to do, but you do not know how to do it, you are in a learning mode and cannot **plan** the approach. You can

only develop a **strategy** for attacking the problem. The best you can do is to decide what you must do NOW in order to learn what you should do later. In other words, you need a strategy for discovering what to do. If the objective is to increase the reliability of a component, it will be necessary first to gather data about experience with the component. Then it will be necessary to analyze the information. Based on the analysis, certain corrective measures will be indicated, but it will not be certain if these measures will be adequate.

In a strategy, each step that is taken is **determined by the previous step**. The outcome is always in doubt.

4. The evolution of a Policy Statement

According to the processes depicted in figure 3, a policy statement is an evolving document. It grows and expands as it is interpreted at each level. As the policy statement and its interpretation work their way down the chain of command, the statements should be modified to become more and more specific as to:

- What is to be done,
- Why it is to be done,
- When it is to be done,
- Who is to do it,
- How it is to be done, and
- How the results are to be evaluated.

5. Targets and the importance of “Benchmarking”

One of the least well understood of Dr. Deming’s 14 points is his point #11⁹

“Eliminate work standards (quotas) on the factory floor. Substitute leadership. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.”

⁹ Deming, W. Edwards, Out of the Crisis, pg. 24. Published by Center for Advanced Engineering Study, MIT, Cambridge, MA 02139. (1982)

Many persons have interpreted this admonition to mean that **no** numbers should ever be used when giving an assignment. This is not what Dr. Deming intended. The question is rather what is done with the numbers. Numbers are required for planning. They are required for scheduling. There is no way to coordinate the activities of several departments without numbers. Numerical targets are also necessary. The question is how the numbers will be used.

If the numbers are used to judge **individual performance**, or to determine bonuses and other rewards, it is likely that target setting will be counterproductive. If the numbers are pulled “out of the air” by managers as a means to whip their subordinates into a frenzy of activity, they will be counterproductive. If those who receive the targets cannot see how they can possibly meet them, and are offered no help from the management, they will be counterproductive. If the numbers are seen to be without foundation (every year we ask for 10% more) they will be counterproductive.

6. On the difference between Policy Deployment and MBO

Deming’s point #11 is not an admonition against the use of numbers; it is concerned with what is done with the numbers. Deming specifically warns against using the target in the style of MBO (Managing by Objectives). Under MBO, the targets **negotiated** between a manager and a subordinate are directly tied to the performance rating and salary of the subordinate. According to this process the Manager and subordinate negotiate a “contract” under the terms of which the subordinate agrees to achieve the target specified. There are benefits and costs to the subordinate associated with achieving or not achieving the target. These are also agreed upon beforehand.

The idea is to put the subordinate in the same position as the independent owner of a small business; to put some risk back into his life. Unfortunately, this contractual relationship ignores the fact that the circumstances are not the same. The independent owner of a small business is subjected to the vagaries of the

marketplace. The owner does not negotiate targets. They are what they are while the owner of the business does whatever he or she can to deal with them. On the other hand, the subordinate works in a system and what is accomplished is as much, if not more, a result of how the **system** performs and not just how well the individual person performs. In the negotiation process the subordinate and the manager sit on opposite sides of the table. They do not form a team. They are adversaries.

On the other hand, if the manager treats the target as “our” objective, that is, the joint responsibility of the manager and the subordinate, and they work together to see how best to accomplish it, the target can be a useful stimulus to both of them.

Every improvement effort should be measured. Targets for achieving an improvement should be set based upon benchmarking, competitive requirements, knowledge of system capability and knowledge contributed by the people who will have to do the work.

The achieved values compared to the targeted values should **not** be used to measure the performance of the people; they measure the combined effects of the system for improvement and the forecasting system.

9. MEASUREMENT

As the policy statement evolves, it is to be expected that each interpretation will add quality measures to be tracked and will set targets for them. In many cases the amount of improvement cannot be foretold and the target will be no more than a “swag¹⁰”. It will represent the judgement of someone and not much more. The strategy will probably begin with a plan to take data, to make observations, to analyze the data and to propose a next step. Despite these limitations, each person who interprets the policy statement is expected to propose what to measure, how to measure it and to set in motion a process for tracking the quality measures. Where an improvement should result in better results for a customer (either internal or

¹⁰ “swag”=“Scientific Wild-Assed Guess”

external) the quality measures should be expressed in customer terms.

In general improvements may be classified in one of the following categories. **Quality** - either of product or process. In general quality of product follows from improvement of quality of process. **Cost** - cost reductions can be achieved either by changing materials, by changing a design or by reducing the waste in a process. Cost can also be reduced by shortening cycle time. If we include waste of space, wasted time, excess inventory in our measures of waste we may set targets for any of these as a means of driving down cost. **Delivery** - decreasing the time and decreasing the uncertainty. **Breakthrough** - in general one cannot plan to make a discovery, so it is not possible to schedule a breakthrough. On the other hand, it often happens that new approaches can be found to old problems and an analysis of existing bottlenecks and barriers will often point to the need for a breakthrough. A manager should be willing to assign people to work on a strategy for finding a better way.

Reference

[Http://www.deming.ces.clemson.edu/pub/den/pol_dep.pdf](http://www.deming.ces.clemson.edu/pub/den/pol_dep.pdf)

Module 6. Topic 18. Quality Function Deployment

1. Introduction to QFD

Quality Function Deployment (QFD) is a set of powerful product development tools that were developed in Japan to transfer the concepts of quality control from the manufacturing process into the new product development process.

Yoji Akao is widely regarded as the father of QFD and his work led to its first implementation at the Mitsubishi Heavy Industries Kobe Shipyard in 1972. Yoji Akao defined QFD as *"a method for developing a design quality aimed at satisfying the consumer and then translating the consumer's demands into design targets and major quality assurance points to be used throughout the production phase"*.

The main features of QFD are a focus on meeting market needs by using actual customer statements (referred to as the "Voice of the Customer"), its effective application of multidisciplinary teamwork and the use of a comprehensive matrix (called the "House of Quality") for documenting information, perceptions and decisions. Some of the benefits of adopting QFD have been documented as:

- Reduced time to market,
- Reduction in design changes,
- Decreased design and manufacturing costs,
- Improved quality,
- Increased customer satisfaction.

The matrix is commonly referred to as the "House of Quality" and is often perceived to represent QFD in its entirety (see figure 1).

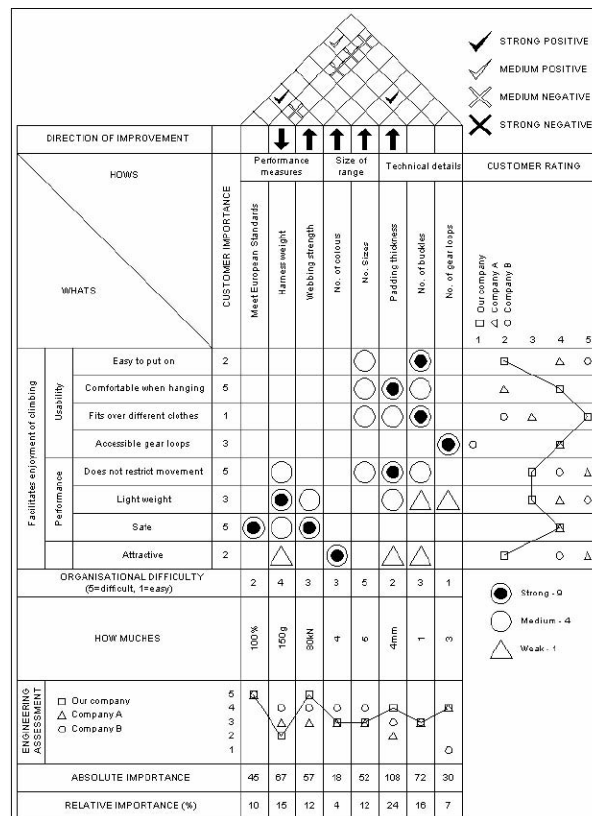


Figure 1. House of Quality

2. The House of Quality.

The "House of Quality" matrix is the most recognised form of QFD. It is utilised by a multidisciplinary team to translate a set of customer requirements, drawing upon market research and benchmarking data, into an appropriate number of prioritised engineering targets to be met by a new product design. There are many slightly different forms of this matrix and this ability to be adapted to the requirements of a particular problem or group of users forms one of its major strengths. The general format of the "House of Quality" is made up of six major components which are completed in the course of a QFD project (see figure 2):

- **Customer requirements (HOWs)** - a structured list of requirements derived from customer statements.
- **Technical requirements (WHATs)** - a structured set of relevant and measurable product characteristics.

- **Planning matrix** - illustrates customer perceptions observed in market surveys. Includes relative importance of customer requirements, company and competitor performance in meeting these requirements.
- **Interrelationship matrix** - illustrates the QFD team's perceptions of interrelationships between technical and customer requirements. An appropriate scale is applied, illustrated using symbols or figures. Filling this portion of the matrix involves discussions and consensus building within the team and can be time consuming. Concentrating on key relationships and minimizing the numbers of requirements are useful techniques to reduce the demands on resources.
- **Technical correlation (Roof) matrix** - used to identify where technical requirements support or impede each other in the product design. Can highlight innovation opportunities.
- **Technical priorities, benchmarks and targets** - used to record the priorities assigned to technical requirements by the matrix, measures of technical performance achieved by competitive products and the degree of difficulty involved in developing each requirement. The final output of the matrix is a set of target values for each technical requirement to be met by the new design, which are linked back to the demands of the customer.

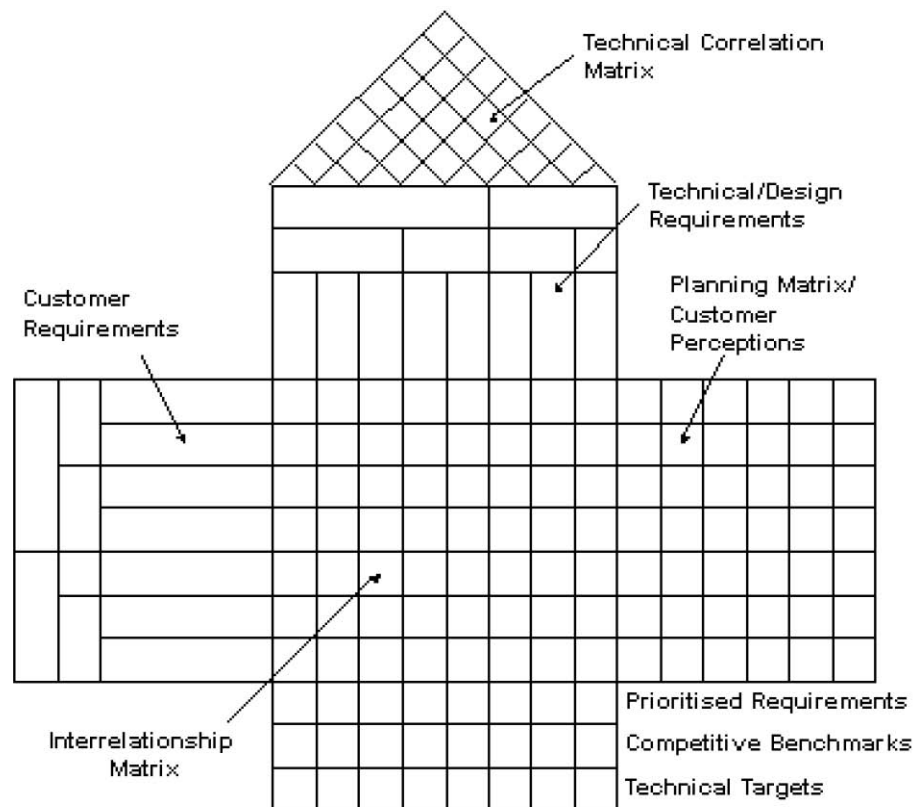
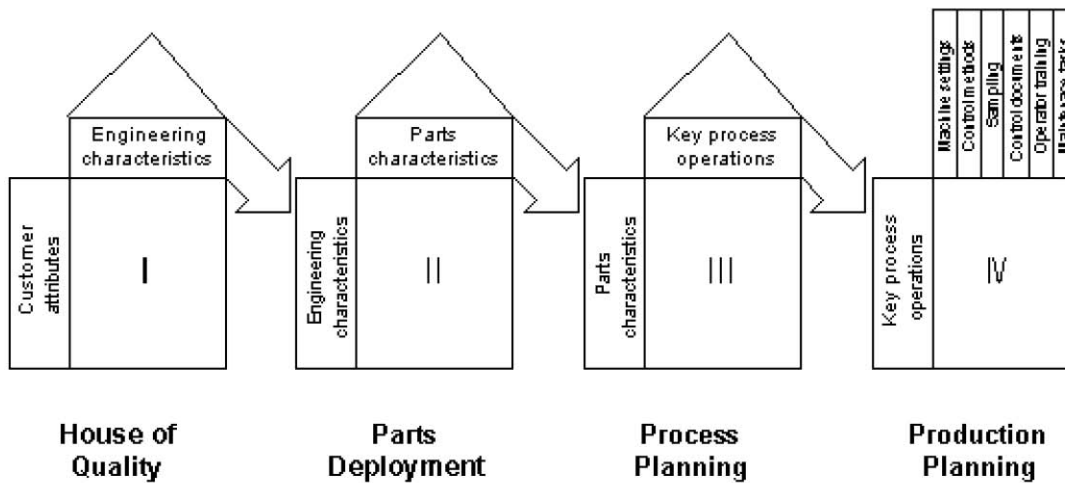


Figure 2. Six major components of the "House of Quality"

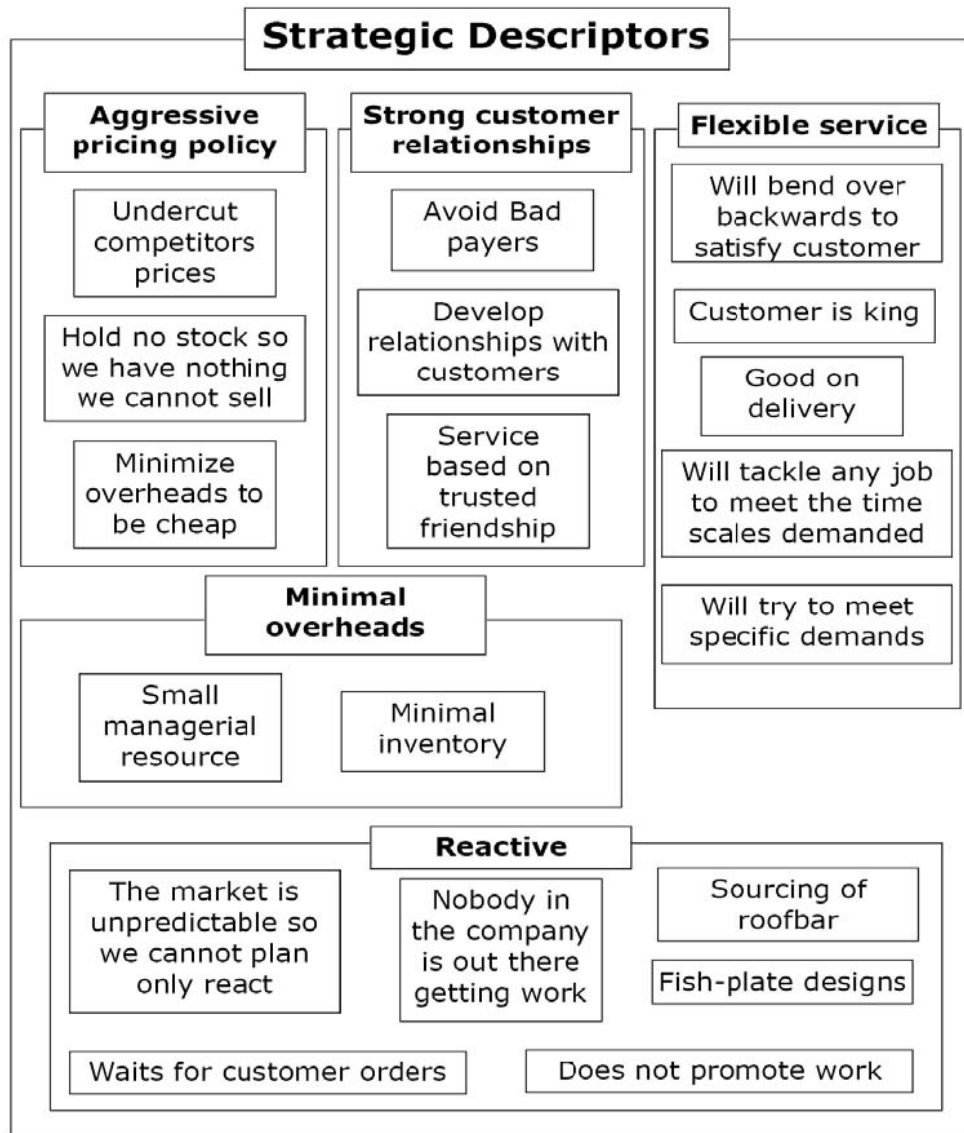
Models for Applying QFD Tools. The "House of Quality" can be used as a stand alone tool to generate answers to a particular development problem. Alternatively it can be applied within a more complex system in which a series of tools are used. The "Clausing Four-Phase Model" is the most widely known and utilised of these approaches ([Ref 3](#)). It translates customer requirements through several stages into production equipment settings; using three coupled QFD matrices and a table for planning production requirements (as shown below).



In addition to the "House of Quality" matrix, QFD utilises "Seven Management and Planning Tools" which are used in many of its procedures: 1. Affinity diagrams, 2. Relations diagrams, 3. Hierarchy trees, 4. Matrices and tables, 5. Process Decision Program Diagrams (PDPC), 6. The Analytic Hierarchy Process (AHP), 7. Blueprinting.

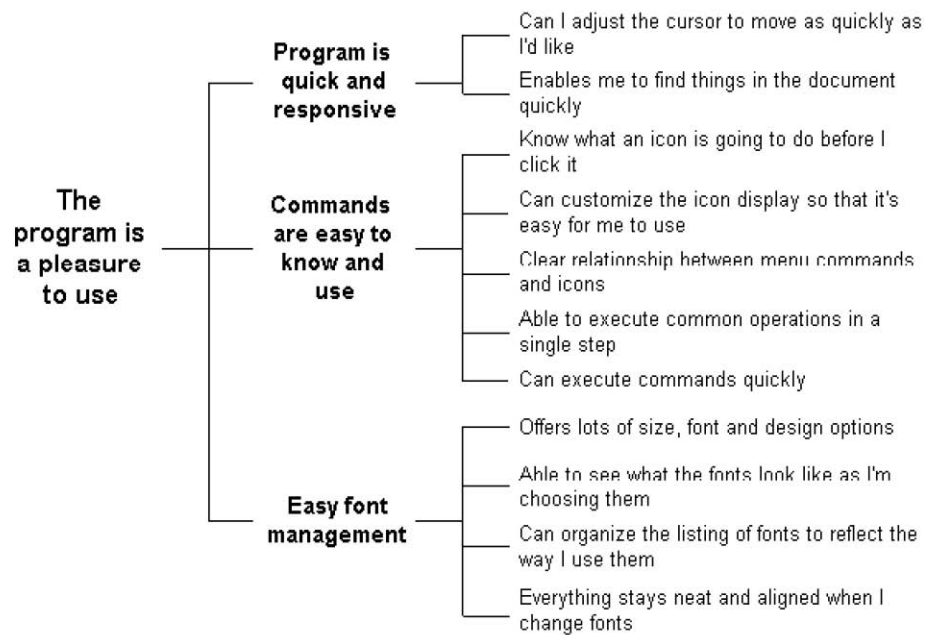
3. Affinity diagrams

This is a powerful method used by a team to organize and gain insight into a set of qualitative information, such as voiced customer requirements. Building an Affinity Diagram involves the recording of each statement onto separate cards which are then sorted into groups with a perceived association. A title card which summarises the data within each group is selected from its members or is created where necessary. A hierarchy of association can be achieved by then sorting these title cards into higher level groups.



4. Hierarchy trees

A Hierarchy tree or Tree Diagram also illustrates the structure of interrelationships between groups of statements, but is built from the top down in an analytical manner. It is usually applied to an existing set of structured information such as that produced by building an Affinity Diagram and is used to account for flaws or incompleteness in the source data. Working down from the top a team can amend at each level and the completed hierarchy can be drawn as shown below.



5. Matrices and tables

The matrix is a tool which lies at the heart of many QFD methods. By comparing two lists of items using a rectangular grid of cells, it can be used to document a team's perceptions of the interrelationships that exist, in a manner which can be later interpreted by considering the entries in particular cells, rows or columns. In a prioritisation matrix the relative importance of items in a list and the strength of interrelationships are given numerical weightings (shown as numbers or symbols). The overall priority of the items of one list according to their relationships with another list, can then be calculated as shown below.

		1	2	3	4	5	6	7	
		Importance of row items							
A	2	2 4	5 10		4 8	1 2			
	5					3 15			
	3	5 15			6 18			1 3	
	2		3 6			8 16	3 6	2 4	
	4		3 12					4 16	
		19	28	0	26	33	6	23	

Tables are also used in QFD to study the implications of gathered or generated items against a specified list of categories. Examples include production planning and analysing customer statements in the Voice of Customer Table shown below.

Part 1

I.D.	Customer demographic (Who)	Voice of the customer	Use									
			What		When		Where		Why		How	
			I/E	Data	I/E	Data	I/E	Data	I/E	Data	I/E	Data

Part 2

Reworded Data	Demanded Quality	Quality Characteristic	Function	Reliability	Comment

6. Relations diagrams

Relations diagrams or Interrelationship Di-graphs can be used to discover priorities, root causes of problems and unstated customer requirements.

7. Process Decision Program Diagrams (PDPC)

PDPC are used to study potential failures of new processes and services.

8. The Analytic Hierarchy Process (AHP)

AHP uses pairwise comparisons on hierarchically organised elements to produce an accurate set of priorities.

9. Blueprinting

Blueprinting is a tool used to illustrate and analyse all the processes involved in providing a service.

Tips for QFD Practitioners

The following advice is based upon the experienced gained in QFD case studies carried out by Research Group at the University of Sheffield and also draws on the work of Bob Hales ([Ref 7](#)) who has suggested adaptations to QFD techniques to make it more compatible with U.S. business culture. This advice is important in overcoming three types of drawback commonly encountered in QFD applications which are detailed in the table below.

Type of Problem	Implications
<i>Misinterpretation</i>	Misunderstanding the correct QFD techniques e.g. mixing technical measures with customer requirements, use of unsorted data and interpreting the "Four-Phase Model" as serial product development.

<i>Time and resource constraints</i>	<p>QFD can demand significant initial investment in training, project facilitation and market research. Its use of a team of key functional representatives makes high demands on stretched personnel resources. Building large, complex charts can make a QFD project very time consuming. In some cases personnel have been unwilling to repeat the use of QFD due to the high demands of the process.</p>
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<i>Culture clash</i>	QFD is based upon Japanese management practices, and so the characteristics of Western management can limit the effectiveness of its techniques. Symptoms of this conflict include poor internal communications particularly between functions, problems building consensus in the QFD team and low team or management commitment to the process.
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The widespread application of QFD in the U.S. and the achievements of these projects illustrate that the techniques are a valuable resource for Western organisations. The potential benefits for UK users are significant, but they need to adopt a flexible approach to both adapting and applying QFD tools. The key to successful QFD implementation in the UK is to account for the characteristics of our organisations and attempt to minimise the obstacles to initial applications. The Table below offers a list of practical advice for embarking upon a programme of QFD application :

Limit demands on company resources	<p>The use of a small QFD team reduces the threat to business cultures where formal teamwork is unknown and will facilitate discussions and achieving consensus. Efforts should also be made to limit the number and length of meetings. Alternatively an individual can build QFD matrices using information gathered in separate interviews. In this case care must be taken in ensuring similar definitions are understood by all participants, and in interpreting and combining the data in the matrix.</p>
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Selection of team members	The choice of QFD team members is fundamental to a project's success. The selection should include the most positive personnel with the closest links with customers. The correct choice will facilitate open discussions, the resolution of conflicts and encourage team commitment to the project.
Recognition of senior management	The involvement of senior management in the formulation of a QFD project is important in gaining their commitment to the process and in providing incentives for personnel participation.
Intuitive checks	The results at each stage of a QFD project should be compared with the intuitive views of the team members. Where a divergence is noted analysis can be directed at identifying the factors responsible. The appropriate changes can then be made to the matrices or the perceptions of the team.
A flexible approach	Care must be taken to adapt the approach used to apply the QFD project to the circumstances of the organisation. e.g. realistic objectives chosen, format of team and meetings, type and complexity of tools used.
Limit the functional or hierarchical conflicts in the QFD team	For an initial QFD implementation functional or hierarchical barriers within the team should be limited to minimise disruptive conflicts. As experience is gained and the techniques are accepted then more sensitive barriers can be challenged.

Conflict avoidance	<p>The selection of team members can reduce the negative aspects of conflict in discussions. Another approach is for the team to list all the issues relating to a contentious matrix relationship and assign weightings to each of these before producing an overall weighting. This divides a difficult discussion into logical steps and helps to separate the individuals from the issues being considered.</p>
Use small matrices	<p>Limiting the size of matrices to eight by eight key requirements helps avoid complexity, focuses the team on the most important issues and reduces the pressure on resources.</p>

Use sensitive market surveys	Be aware of the commercial sensitivity of the information demanded in a standard QFD project. For instance customers may not be willing to report on the performance of competitive products and will have a low opinion of a company demanding such information.
Document issues raised	Record the issues raised during discussions on each matrix interrelationship so at a later date the weighting can be justified drawing upon the original reasoning.

Identify key relationships	When completing the interrelationship matrix, initially highlight the key relationships which have the greatest impact on customer satisfaction. Then focus discussions on establishing the issues relevant to these, rather than a time consuming consideration of every matrix cell.
Recognition of participants	Appropriate incentives must be used to encourage participation. The team should be credited with the achievements of the project on individual and group levels.

The main lesson for would-be QFD Practitioners is to take a realistic approach and develop their own unique QFD system which is appropriate to the characteristics of their own organisation and cultural background, rather than attempt to rigorously apply QFD as described in text books. For more details please refer to the forthcoming article in the Engineering Management Journal.