Business process re-engineering and process management

a survey of current practice and future trends in integrated management

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BPR may provide the kick-start needed to get TQ initiatives moving

Introduction

Business process re-engineering (BPR) was first introduced in 1990 by Hammer[1] and Davenport and Short[2]. In these articles, the authors outlined a new approach to the management of processes which, it was claimed, was producing radical improvements in performance. These articles were quickly followed by a number of articles describing the benefits to be gained from BPR.

However, there remains some confusion as to what exactly constitutes business process re-engineering, and how the concept of re-engineering should be integrated within the strategic and operational management processes of organizations.

Business process re-engineering (BPR)

There is general agreement that BPR involves the radical redesign of business processes with the aim of producing equally radical improvements in performance. However, two areas of confusion remain in much of the literature on the subject.

Terminology

The literature includes many different terms relating to the management and improvement of processes, including business process improvement[3], business process redesign[2,4], core process redesign[5,6], and business restructuring[7,8], as well as business process re-engineering. These concepts cover a continuum of activities ranging from the continuous improvement of processes to the complete restructuring of organizations. What all these terms have in common is the concept of processes, and the need to improve both their performance and design[9]. The difference appears to be one largely of magnitude. The similarities between the above authors can be seen in the various definitions of BPR given in the literature:

> ...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[10].
>
> ...the analysis and design of work flows and processes within and between organizations[2].
>
> ...to rethink, restructure and streamline the business structures, processes, methods of working, management systems and external relationships through which we create and deliver value[8].

Tools and techniques

The above definitions suggest that the radical improvement of processes is the goal of BPR. They do not, however, refer specifically to the tools and techniques used in re-engineering business processes. This has caused some confusion, since different authors often refer to the use of many different tools in re-engineering efforts.These tools and techniques include:

- *Process visualization*. While all authors refer to the need to develop an ideal "end state" for processes to be re-engineered, Barrett[11] suggests that the key to successful re-engineering lies in the development of a vision of the process.
- *Operational research/method study*. Cypress[12] suggests that the tools of operational research and method study are ideally suited to the re-engineering task, but that they are often neglected.
- *Information technology*. Teng *et al.*[13] and Guha *et al.*[14] suggest that information technology,

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including the use of systems analysis techniques as well as the design of new hardware and software, forms a core of the re-engineering effort. Information technology formed the basis of the methodologies suggested by Hammer[1] and Davenport and Short[2]. However, it is interesting to note that neither Hammer or Davenport explicitly includes information technology in their definitions of BPR. As Gadd[9] points out, BPR is not necessarily dependant on IT solutions. Rather it can act as a powerful enabler in the redesign of organizational processes.

- *Change management*. Several authors concentrate on the need to take account of the human side of re-engineering, in particular the management of organizational change. Some, such as Mumford and Beekma[15] and Bruss and Roos[16] suggest that the management of change is the largest task in re-engineering. Others, such as Janson[17], incorporate the human element of re-engineering as an important consideration. The importance of the management of human resources is emphasized by Kennedy[18], who suggests that people often perceive re-engineering as a threat to both their methods of work and their jobs.
- *Benchmarking*. Several authors suggest that benchmarking forms an integral part of re-engineering, since it allows the visualization and development of processes which are known to be in operation in other organizations[8,19-23].
- *Industrial engineering*. Klein[19] suggests that industrial engineers are in a unique position to perform the benchmarking operations required in BPR, due to their technical knowledge of processes.
- *Process and customer focus*. The primary aim of BPR, according to some authors, is to redesign processes with regard to improving performance from the customer's perspective [8,17,19,22,24-27]. This provides a strong link with the process improvement methodologies suggested by authors from the quality field, such as Harrington[3]. In some cases, notably Wastell *et al.*[26] and Chang[22], the terminology is almost identical to that used by quality practitioners in the improvement of processes. The major difference, as outlined earlier, appears to be one of scale.

It should be noted that few authors refer to any single technique when discussing BPR. Most incorporate a mixture of tools from the above list, although the nature of the mix depends on the focus of the author concerned, whether it be technological (e.g. Teng *et al.*[13]) or involving the management of people (e.g. Mumford and Beekma[15]).

In summary, therefore, BPR can be seen to represent a range of activities concerned with the improvement of processes. While some authors appear to suggest that tools and techniques are the key, other authors suggest that a strategic approach to BPR, and the development of a BPR strategy is the key to success[8,14,16,28]. There seems little doubt that efforts on the scale of BPR must be strategically driven and supported by senior management if they are to succeed[9,11,29,30].

While the exact methodologies to be used are the source of some discussion, it can be seen that BPR, as a strategic, cross-functional activity, must be integrated with other aspects of management if it is to succeed[28]. This is particularly true since it is not the methodologies themselves, but rather the way that they are used which is unique in BPR[31]. Of particular interest are the links between BPR and TQM.

BPR and TQM

Total quality management (TQM) is "an approach to improving the competitiveness, effectiveness and flexibility of a whole organization. It is essentially a way of planning, organizing and understanding each activity, and depends on each individual at each level"[32]. TQM involves placing the customer as the focal point of operations. The aim is to continuously improve process performance in order to satisfy customer requirements[3,32].

TQM involves the bottom-down communication and deployment of objectives, and the bottom-up implementation of continuous improvement activities. At the centre of TQM is the concept of the management of processes, and the existence of internal suppliers and customers within organizations[32]. Organizations which have adopted TQM are likely to have developed an understanding of the processes which are operated, and attempt to make the customer the target of improvement activities[32].

BPR also emphasizes focus on the process. However, some authors such as Klein[19] suggest that BPR is much more radical than TQM, while others, notably Davenport[33] and Harrison and Pratt[21] suggest that TQM and BPR can and should form an integrated strategic management system within organizations. Davenport[33] suggests there is a need to undertake process value analysis, in order to identify which processes should be re-engineered, and which should be managed on the basis of continuous improvement. The situation is in reality less clear-cut than re-engineering versus continuous improvement, since improvement activities form a continuum from small incremental improvements to wholesale radical restructuring of operations[9].

Several authors on BPR appear to consider continuous improvement of processes to be the only link to TQM.

However, other aspects of the management of processes are considered vital in both TQM and re-engineering, including benchmarking[8,19-21], culture change[17], and performance measurement[6,14,21]. There is therefore a need to clarify the relationship between BPR and TQM in order to maximize the benefits from each.

Survey of business process re-engineering

Aims of the survey

The aims of the survey were to identify the use of business process re-engineering within different industries in the UK, and to attempt to ascertain the level of integration between business process re-engineering and total quality management at the sample organizations.

Sampling criteria

Questionnaires were sent to managers at organizations identified to be manufacturers, services, public sector organizations (including local and national governmental bodies), and National Health Service Trusts (hospitals). In total, 125 questionnaires were sent to managers in each sector.

In total, 65 responses were received, giving an overall response rate of 13 per cent. Of these, 18 were from managers of NHS trusts (response rate of 14.4 per cent), 13 from manufacturers (10.4 per cent response rate), 25 from services (20 per cent response rate), and nine from the public sector (7.2 per cent response rate) (see Figure 1).

Respondents represented a broad range of functions, including marketing (four respondents), operations management (seven), quality (27), human resources management (six), and information systems (six). Senior managers (directors including managing directors or chief executives) accounted for the remaining respondents.

Experience of TQM

Table I shows the implementation of TQM among the respondent organizations by industrial sector. The majority of respondents (49 or 75 per cent) reported that their organization had implemented TQM. The average experience of TQM for the sample as a whole was 3.18 years. NHS trusts had on average almost one year less experience with TQM than manufacturing organizations (see Figure 2). Manufacturing companies, services, and public sector organizations had similar length of experience with TQM.

Figure 1. *Respondents by industrial sector*

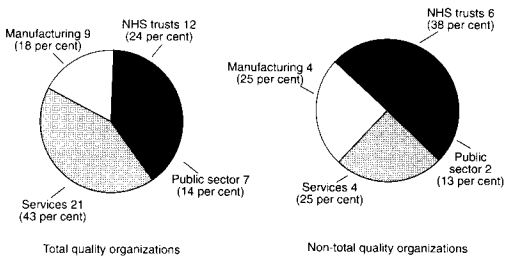


Table I. *TQM implementation by industrial sector*

Sector	Total quality organizations Number	Per cent	Non-total quality organizations Number	Per cent	Total quality experience Years
NHS trusts	12	67	6	33	2.58
Manufacturing	9	69	4	31	3.56
Services	21	84	4	16	3.33
Public sector	7	78	2	22	3.33
Total	49	75	16	25	

The implementation of TQM is important, since as stated earlier, TQ organizations would be expected to have adopted a customer and process focus to a greater extent than non-TQ organizations, prior to any re-engineering efforts.

Strategic management

Several authors suggest that both TQM and BPR must be driven by strategy[32,33]. Respondents were asked to identify which of a range of strategy development and goal deployment activities had been implemented or were planned to implement by their organization.

Sinclair[34] found that when organizations had implemented such activities, strategy development and goal deployment was likely to be more successfully

Figure 2. *TQ experience by industrial sector*

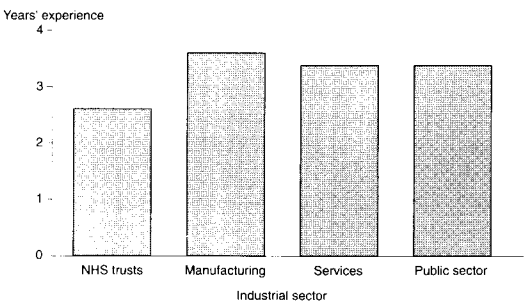


Table II. *Strategy development and goal deployment activities*

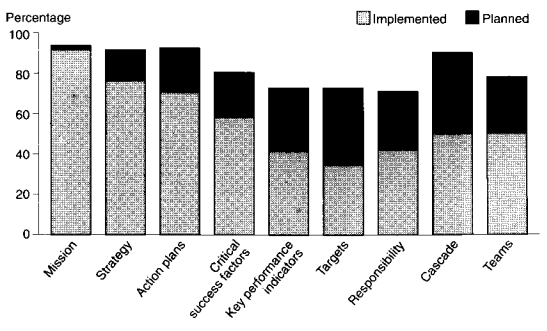
Strategic activities	Implemented		Planned		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Publicized mission statement	60	92	1	1	61	94
Strategic plan (to achieve the mission)	50	77	10	15	60	92
Action plans (to implement the strategy)	46	71	14	22	60	92
Defined set of critical success factors (CSFs)	38	59	14	22	52	80
Key performance indicators (KPIs) (to quantify performance)	27	42	21	32	48	74
Defined performance targets for KPIs	23	35	25	9	48	74
Responsibility defined for CSFs	28	43	19	29	47	72
Communicate and cascade through the organization	33	51	26	40	59	91
Core process teams	33	51	18	28	51	78

integrated within the management of an organization than if the techniques were not used. It was also found that organizations which have implemented TQM are more likely to have introduced such techniques. The strategic activities undertaken and planned by the respondent organizations are shown in Table II.

The majority of respondents reported that their organization had already implemented or had plans to implement all activities outlined in Table II.

Table II shows that the lowest figure (including plans) was 72 per cent for the assignment of responsibility for critical success factors (see Figure 3). This suggests that, for the sample as a whole, the majority of organizations had undertaken some, if not all, of the strategic activities suggested by Sinclair[34]. However, it should be noted that when planned actions are removed, significant majorities exist only for the development of mission statements, strategies, action plans, and critical success factors.

Figure 3. *Strategy development and goal deployment: activities implemented and planned*



Further analysis showed that while TQ organizations and non-TQ organizations rate similarly against several of the activities shown in Table II, there are some important differences. Organizations which have implemented TQM are more likely to define critical success factors, key performance indicators and performance targets, and to assign responsibility for CSFs and develop teams responsible for core business processes. This finding is similar to that reported by Sinclair[34].

Analysis by industrial sector revealed no significant differences (in part due to the small sample size in each sector), although public sector organizations were more likely to have set performance targets, assigned responsibility, cascade objectives, and develop process teams than other sectors.

Process improvement

Table III and Figure 4 show the numbers of respondents reporting that their organization had defined and documented a range of process factors (or planned to do so).

When considering activities already completed, only core processes, customer requirements and performance targets have been defined and documented by the majority of organizations in the survey, although the majority planned to undertake all activities. Further analysis shows that organizations which have implemented TQM are more likely to have already undertaken such activities than other organizations.

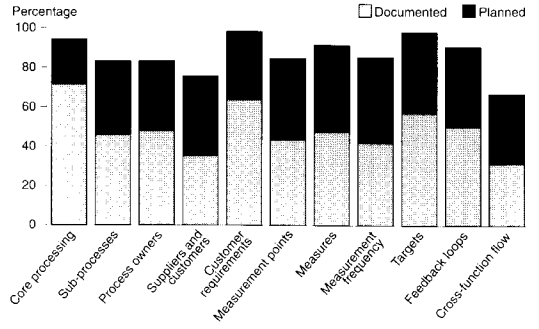
Table III. *Process definition and documentation*

Process factors	Documented		Planned		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Core processes defined and documented	46	71	14	21	60	92
Sub-processes documented	29	45	24	37	53	82
Process owners identified	31	47	23	35	54	83
Suppliers and customers identified	22	34	26	40	48	74
Customer requirements defined	40	62	22	34	62	95
Process measurement points found	27	42	26	40	53	82
Process performance measures set	30	46	28	43	58	89
Measurement frequency determined	26	40	27	42	53	82
Performance targets set	36	55	26	40	62	95
Feedback loops and reporting defined	31	48	26	40	57	88
Cross-functional flows identified and managed (workflows across departments)	19	29	23	35	42	65

Organizations which have not implemented TQM account for the majority of those planning to undertake the activities outlined in Table III. This again confirms results found by Sinclair[34] in an earlier survey.

Respondents were also asked to identify which, if any, process improvement techniques were used in their organization. Again, organizations which had implemented TQM were found to be more likely to already use or to plan to use techniques including statistical process control (SPC), process improvement frameworks (such as the Deming Cycle), quality improvement teams (QITs), problem-solving techniques, failure mode effect analysis (FMEA), process performance measurement, and the empowerment of individuals. The greatest differences were found in the use of quality improvement teams and problem solving techniques, which are often used in parallel[32].

Figure 4. *Process definition and documentation: process factors documented and planned*



In terms of industry sector, manufacturing organizations were found to use SPC, FMEA, and process performance measurement more widely than other organizations. This in part reflects greater experience with TQM (see earlier), and also greater experience and understanding of the nature of processes in manufacturing industry[32].

Self-assessment

New measurement techniques – based on criteria originally developed for quality awards – have been developed in both Europe and the USA. The use of such techniques to monitor the "health" and performance of organizations is termed "self-assessment"[32,33]. The most common frameworks for self-assessment are based on the Malcolm Baldrige National Quality Award (MBNQA) criteria (from the USA), and the European Quality Award (EQA) criteria. It would be expected that UK organizations would be more likely to use the EQA framework, since it is European, and was also designed with use for self-assessment in mind.

Respondents were asked to identify which, if any, approaches are used to assess the overall performance of their organization. This included the EQA and MBNQA criteria, and also other criteria which may be developed by the organization itself (see for example Sinclair[34]).

In total, 12 organizations (18 per cent) reported already having used the EQA or Baldrige criteria for self-assessment purposes. Of these the vast majority (ten organizations) had used the EQA criteria. A further 15

organizations planned to use the EQA criteria for self-assessment purposes, while one other organization suggested that the Baldrige criteria would be used. Eight of the ten organizations which had already used the EQA criteria for self-assessment, and 14 of the 15 that planned to do so had implemented TQM. All three organizations which used/planned to use the Baldrige framework for self-assessment had implemented TQM. It was found that services and manufacturing organizations were more likely to use self-assessment than NHS trusts or public sector organizations.

Eleven organizations reported that they used internally designed criteria for self-assessment purposes. It is not possible to identify what systems were developed. However, of those organizations, ten had implemented TQM and four of these were also NHS trusts.

Respondents were also asked to state the purposes for which self-assessment was undertaken or planned by their organization. The primary uses of self-assessment were found to be the identification of opportunities for improvement (60 respondents or 92 per cent) and to benchmark internally within the organization (52 or 80 per cent), while a significant number also suggested that self-assessment would be used to audit the culture of the organization (72 per cent). The same proportions were found when considering industrial sectors and TQM implementation.

Interestingly, the least widely suggested reason for the use of self-assessment was targeting a quality award. Only 51 per cent of all respondents suggested that this had been/would be a reason for using self-assessment.

Benchmarking

Although benchmarking can play an important role in both TQM and BPR, it was felt necessary to identify the use of benchmarking techniques separately. Sinclair[34] found that it is often necessary to identify benchmarking activities undertaken by organizations in some detail, since what some organizations term "benchmarking" is far removed from the processes suggested in the literature[35,36].

Table IV and Figure 5 show the benchmarking techniques used and planned by the respondent organizations. The majority of organizations had, at the time of the survey, examined published statistics and used customer surveys to benchmark competitors. A significant number also planned to benchmark internal performance and internal processes. The proportions of organizations using the techniques shown in Table IV and Figure 5 were similar across industrial sectors and between TQ and non-TQ organizations.

Less than half of the organizations in the survey planned to undertake formal benchmarking exercises of competitor or best practice processes. This has implications for both TQM and re-engineering efforts, since benchmarking is reported to be an important tool for use in improving process performance[32].

Respondents were asked to identify the purposes for which benchmarking is/would be used in their organization. Benchmarking was found to be most commonly used to identify "gaps" in performance, and

Figure 5. *Benchmarking activities*

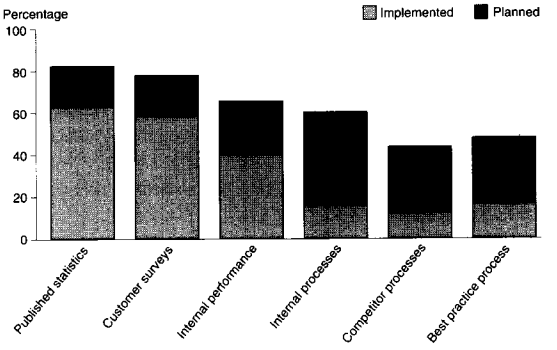


Table IV. *Benchmarking activities*

Benchmarking via	Implemented Number	Implemented Per cent	Planned Number	Planned Per cent	Total Number	Total Per cent
Comparison of performance to published statistics	41	63	13	20	54	83
Customer surveys	38	59	12	19	50	78
Internal performance	26	40	17	26	43	66
Internal processes	10	15	29	45	39	60
Competitor processes	7	11	21	32	28	43
Best practice processes	10	15	21	32	31	48

opportunities for improvement. A large number of respondents suggested, however, that benchmarking would also be used to identify best practice performance and processes in the future.

Business process re-engineering

Respondents were asked to identify which scale of processes their organization had attempted (or planned) to re-engineer, in order to identify the scope of re-engineering activities undertaken. For this purpose processes were defined as intra-departmental (within departmental boundaries), inter-departmental (between departments), core business processes (from external suppliers to external customers), and inter-organizational processes (processes including activities outside of the organization).

Data analysis showed that 26 (40 per cent) of organizations in the survey had undertaken re-engineering efforts on both intra-departmental processes and core business processes, while 20 (31 per cent) had re-engineered inter-departmental processes. In comparison, only nine respondents (14 per cent) suggested that their organization had attempted to re-engineer inter-organizational processes. When planned re-engineering activities were considered, it was found that respondents from more than 70 per cent of organizations suggested that their organization had or planned to re-engineer each type of process except for interorganizational processes, which only 54 per cent had re-engineered or planned to do so. No significant differences were found between industrial sectors or organizations which had implemented TQM and those which had not.

Respondents were next asked to identify the levels of improvement expected from re-engineering efforts, and the actual benefits resulting from re-engineering, and the actual and expected timescale of BPR projects. Both sets of questions used five-point scales, although only the level of improvement (using percentages) was truly linear. Time-scale used a five-point scale of weeks, months, a year, one to three years, and more than three years. Although not linear, the scale gives an approximate indicator of the length of projects. The important factor was to compare actual and expected time-scales for each item, and the same scale was used for each item.

Table V and Figure 6 show the expected and actual level of improvement and time-scale of BPR projects against a number of factors.

It can be seen immediately from Table V that the actual level of improvement across all factors was less than the level expected. Similarly, the actual time-scale of re-engineering projects always exceeded the expected time-scale. This suggests that organizations attempting re-engineering are either overestimating projected improvements and underestimating the time-scale of projects at their inception (perhaps due to inexperience in BPR), or are facing problems during BPR projects.

Examining the data by industrial sector showed that manufacturing organizations expected the greatest level of improvement in all targets except for information technology and management systems, and yet only received higher levels of improvement in organization restructuring than other industries. In terms of actual levels of improvement, public sector organizations rated highest in terms of process design, management systems, roles and responsibility, reward and recognition systems, and skills. This may reflect a less advanced starting point before re-engineering efforts, although NHS trusts have less experience of TQM on average, but show higher levels of actual improvement.

Interestingly, organizations which had implemented TQM expected greater levels of improvement in all factors except for process design and information technology than non-TQ organizations, but only exceeded non-TQ organizations in actual improvements in reward and recognition systems.

In terms of the expected and actual length of re-engineering projects, there were no significant industrial sector differences. TQ organizations expected and actual time-scales were longer than non-TQ organizations, except for the development of skills and organizational culture. In other words, when TQ organizations expected improvements in areas to take longer than non-TQ organizations, they did, and vice versa.

Overall, therefore, it can be seen that TQ organizations generally gained less improvement (and less than they themselves expected) from BPR than non-TQ organizations, while the projects took longer. This may be due to greater experience with process management than non-TQ organizations, and the consequent reduction in scope for improvement, or may reflect more fundamental difficulties with BPR for TQ organizations.

The differences between actual and expected results in Table V are shown graphically in Figure 6, with the mean of the difference between expected and actual improvement and timescale set to zero, and limits set at 95 per cent confidence intervals. Figure 6 shows that in fact the only statistically significant difference between actual and expected improvement and project time-scales across the range of factors in Table V is in the gap between actual and expected improvement of organization culture.

Respondents were next asked to identify the make-up of teams involved in re-engineering, in terms of the initiation, leadership, and participation in BPR projects, as shown in Table VI and Figure 7.

Table V. *Re-engineering: actual and expected results*

Re-engineering targets	Level of improvement			Time-scale		
	Actual	Expected	Actual – Expected	Actual	Expected	Actual – Expected
Organization structure	3.1	1.9	1.2	3.3	3.4	–0.1
Organization culture	3.5	1.8	1.7	4.0	4.3	–0.3
Process design	3.2	1.9	1.3	3.2	3.3	–0.1
Information technology	2.9	1.9	1.0	3.4	3.6	–0.2
Performance measures	3.4	2.0	1.4	3.0	3.2	–0.2
Management systems	3.2	1.9	1.3	3.3	3.5	–0.2
Roles and responsibility	3.5	2.4	1.1	3.0	3.5	–0.5
Reward and recognition systems	2.8	1.9	0.9	3.3	3.6	–0.3
Skills (via training)	3.3	2.4	0.9	3.9	4	–0.1

Note: "Re-engineering targets" refers to those aspects of organizations/processes targeted for re-engineering

Figure 6. *Expected versus actual progress: expected minus actual progress*

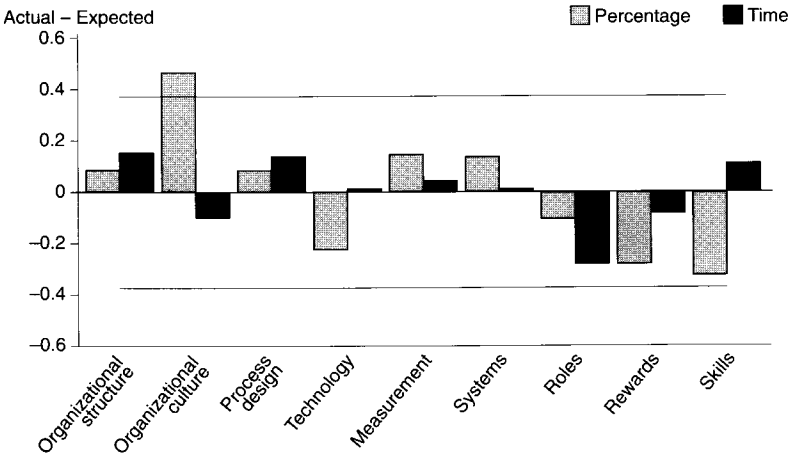
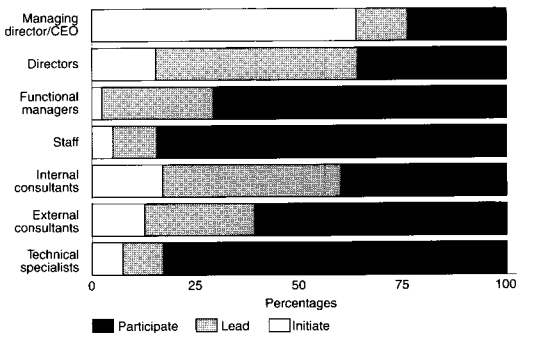


Table VI. *BPR teams: members and roles*

Members	Roles		
	Initiate	Lead	Participate
Managing director/CEO	25	5	9
Directors	7	23	16
Functional managers	1	12	29
Staff	2	4	33
Internal consultants	5	13	12
External consultants	3	6	15
Technical specialists	1	2	15

Figure 7. *BPR teams: members and roles*



The results shown in Table VI show the number of managing directors, staff, etc. who initiate, lead and participate in BPR. It should be noted that the figures are not mutually exclusive, and the size of teams was not specified. The aim was to gain an insight into the roles of different individuals in BPR project teams, rather than produce a definitive prescription for team membership and roles.

Table VI shows that managing directors (or chief executives) are the primary initiators of BPR projects. It appears that such individuals then tend to pass responsibility for the leadership of BPR projects to other managers, particularly directors. The high proportion of managing directors initiating BPR and directors leading BPR projects suggests that the senior management commitment required for successful BPR should be forthcoming.

In a number of cases leadership of BPR projects is passed to functional managers or internal consultants. Functional managers are, however, more likely to be included in the BPR team, but not to lead it. Indeed functional managers and staff make up the bulk of the members of BPR teams. Several organizations include consultants (both internal and external) and technical specialists (such as information technology experts), and directors in BPR teams. It appears, however, that functional managers and staff make up the bulk of BPR project teams. There were no significant differences in the make-up of BPR teams in different industrial sectors or when comparing TQ and non-TQ organizations.

Respondents were next asked to identify the use and importance of various tools and techniques in BPR on a scale of 1-5, where 1 = low use/importance, and 5 = high use/importance. The results are shown in Table VII.

Table VII and Figure 8 show that the most important techniques in BPR were considered to be training employees, the communication of objectives, and performance measurement. This suggests that respondents felt that the management of human factors was of primary importance. Training employees and changing performance measurement and communicating objectives were also the most widely used technique in BPR, suggesting that the use of techniques was not felt to be a major problem.

Further analysis suggested that while industrial sector does not greatly affect the choice of techniques in BPR, organizations which have implemented TQM use organizational restructuring, benchmarking and the development of a process focus more widely than other organizations. Non-TQ organizations, on the other hand, tend to emphasize the use of investment in information technology and work-study methods. These are also rated as more important by non-TQ organizations than TQ organizations.

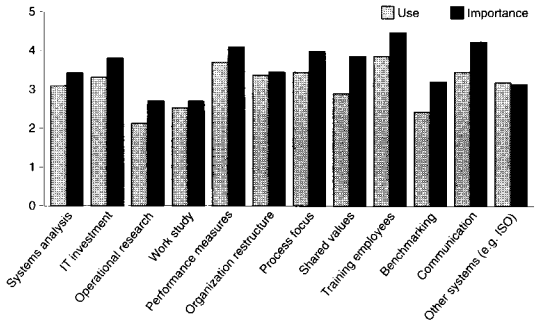
Respondents were then asked to suggest which factors have inhibited and facilitated BPR in their organization, and how important each factor has been in the introduction of BPR (scale of 1-5). Each factor was presented in neutral terms, in order to avoid biasing possible responses. The results are summarized in Table VIII (44 respondents answered each of the questions).

Table VIII shows that the majority of factors were perceived to be facilitators more often than inhibitors by the majority of respondents. Only two factors, existing information systems and management systems, were defined as inhibitors more often than facilitators. Available IT expertise, project time frames, and

Table VII. *Use and importance of BPR techniques*

Techniques	Use	Importance	Difference (Use – Importance)
Systems analysis	3.1	3.4	–0.3
IT investment	3.3	3.8	–0.5
Operational research	2.2	2.7	–0.5
Work study	2.6	2.7	–0.1
Performance measurement	3.7	4.1	–0.4
Organizational restructuring	3.5	3.6	–0.1
Process focus	3.6	4	–0.4
Develop shared values	2.9	3.9	–0.9
Training employees	3.9	4.5	–0.7
Benchmarking	2.6	3.3	–0.7
Communication	3.6	4.3	–0.7
Other systems (e.g. ISO 9000)	3.2	3.2	0

Figure 8. *Use and importance of BPR techniques*



organization structure and culture were found to be quite frequently mentioned as inhibitors, although they were more often classed as facilitators.

The only significant difference in perception between TQ and non-TQ organizations was that non-TQ organizations found organization culture and structure to inhibit BPR more frequently than TQ organizations. Few differences stand out in analysing responses by industrial sector. However, manufacturing organizations reported project time-scales to inhibit BPR less frequently than other sectors, services felt organization structure inhibited BPR more often than other sectors, and public sector respondents suggested organization culture was less often an inhibitor than other sectors.

When the importance of the factors affecting BPR is considered, the analysis is more reassuring. The most important factors (leadership, customer focus, training, team make-up and communication of objectives) were all reported to facilitate BPR much more often than inhibit. The rankings of factors by importance were also virtually identical for each industrial sector and for TQ and non-TQ organizations.

Table VIII. *Inhibitors and facilitators to BPR*

Factors	Inhibit	Facilitate	Importance
Leadership	8	36	4.6
Team make-up	6	38	4.4
Available IT expertise	15	29	3.3
Project targets	8	36	3.8
Customer focus	0	44	4.4
Existing IT systems	29	15	3.5
Time frame for projects	16	28	3.8
Process knowledge	10	34	3.4
Management of change	15	29	4.2
Communication	8	36	4.3
Management systems	23	11	3.4
Performance measurement	7	37	4.0
Training	2	42	4.3
Organization structure	19	25	3.5
Organization culture	18	26	4.2
Investment	9	35	3.5

Respondents were finally asked to compare the actual and expected benefits from BPR, in terms of various measures of performance (using scale of 1-5, from low to high). The results are shown in Table IX.

Table IX and Figure 9 show that the expected benefits in terms of performance improvements generally exceeded the actual benefits of BPR. The greatest benefits were expected in terms of improved financial performance, quality, customer satisfaction, process and organizational flexibility, and increased competitiveness. Of these measures, only improvements in financial performance and organizational flexibility ranked significantly lower than expected. Increased competitiveness, on the other hand, ranked higher in terms of actual benefit than expected.

TQ organizations generally expected and obtained greater improvements in performance than non-TQ organizations. This contrasts with earlier analysis of the improvements from BPR projects, but perhaps suggests TQ organizations focus more on measurable performance improvements than non-TQ organizations. Non-TQ organizations obtained greater benefit than TQ organizations only in customer satisfaction and process times.

Some differences were observed between the different industrial sectors in the survey. In terms of expected benefits, public sector respondents rated productivity relatively higher than other sectors, and manufacturers rated process times higher than the rest, while services rated employee development lower than other respondents.

The main differences in terms of actual benefits were observed in the NHS trusts and public sector organizations. Public sector respondents suggested actual improvements in financial performance, process time, competitiveness and process knowledge higher than other respondents. NHS trust respondents rated improvements in quality, innovation, employee development and organizational restructuring higher than other respondents. Manufacturers reported greater improvements in organizational flexibility as a result of BPR than other respondents.

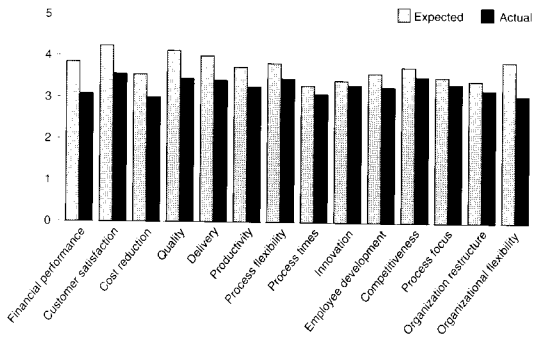
Integrated management

The purpose of this section of the questionnaire was to examine the management practices and approaches which are currently used by respondent organizations. Respondents were asked to rate the importance and level of integration of various management practices on scales

Table IX. *Benefits from BPR*

Benefits	Expected	Actual	Difference (Expected – Actual)
Financial performance	3.9	3.1	0.8
Customer satisfaction	4.3	3.6	0.7
Cost reduction	3.6	3.0	0.6
Product/service quality	4.1	3.5	0.6
Delivery performance	4.0	3.4	0.6
Productivity	3.7	3.3	0.4
Flexibility/responsiveness	3.9	3.5	0.4
Process times	3.3	3.1	0.2
Innovation	3.4	3.3	0.1
Employee development	3.6	3.3	0.3
Increased competitiveness	3.8	3.6	0.2
Process focus	3.6	3.4	0.2
Organization restructuring	3.5	3.3	0.2
Organization flexibility	3.9	3.1	0.8

Figure 9. *Benefits from BPR*



of 1-5, where 1 = low importance/integration, 5 = high importance/integration. The importance and integration of various management practices is shown in Table X.

Table X and Figure 10 show that respondents considered strategic planning and management, performance measurement, performance appraisal and management and change management to be the most important management practices. These also rated the highest in terms of their integration into the overall management of organizations. This suggests that when importance is placed on management practices, they will become embedded in the management systems of an organization. On the other hand, the differences between importance and integration for all factors are quite large, suggesting that there may be a problem achieving true integration of such practices.

Analysis of responses by the use of TQM shows some expected differences, such as TQ organizations rating TQM and benchmarking to be significantly more important than non-TQ organizations. TQ organizations also rate performance measurement, change management and reward and recognition to be more important than non-TQ organizations. TQ organizations suggested that all of the practices listed were more integrated in their organizations than in non-TQ organizations. Apart from TQM, there were significant differences in the level of integration of performance appraisal and management and reward and recognition – both being much higher in TQ organizations.

Public sector respondents rated TQM, benchmarking, BPR, competitive analysis, and empowerment to be significantly less important than respondents from other sectors, while manufacturers rated competitive analysis more important than the rest, and NHS trusts rated empowerment far more important than other sectors.

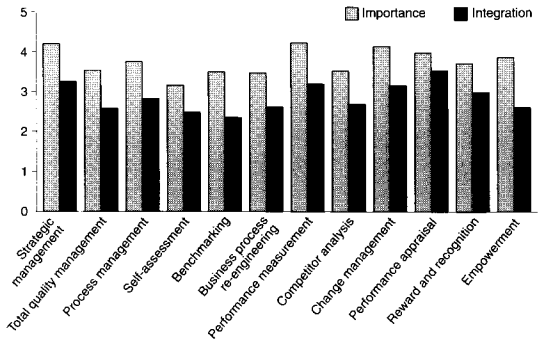
In terms of the level of integration, NHS trusts rated TQM, benchmarking, change management and empowerment as more highly integrated than other sectors, while managers in the public sector rated BPR and performance measurement as more highly integrated than the others.

Respondents were finally asked to rate the current and future approaches to management that would be used in

Table X. *Importance and integration of management practices*

Management approaches	Importance	Integration	Difference (Importance – Integration)
Strategic management	4.2	3.3	0.9
Total quality management	3.6	2.6	1.0
Process management	3.8	2.9	0.9
Self-assessment	3.2	2.6	0.6
Benchmarking	3.5	2.4	1.1
Business process re-engineering	3.5	2.7	0.8
Performance measurement	4.2	3.2	1.0
Competitor analysis	3.6	2.7	0.9
Change management	4.2	3.2	1.0
Performance appraisal/management	4.0	3.5	0.5
Reward and recognition	3.7	3.0	0.7
Empowerment	3.9	2.7	1.2

Figure 10. *Management practices: importance and integration*



their organizations. Usage was on a scale of 1-5, where 1 = low use, 5 = high use. The results are summarized in Table XI.

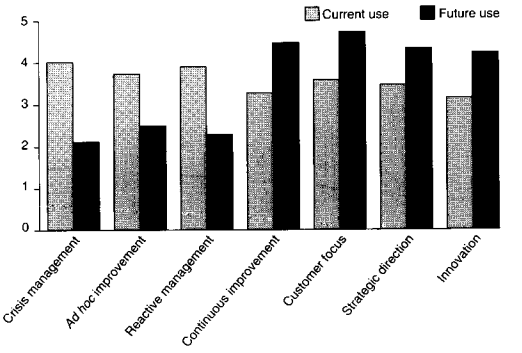
Figure 11 and Table XI show that organizations in the sample intend to alter the management approaches in the future from those currently use. The focus is to move away from reactive, event-driven management, to strategic, customer-focused improvement. This is perhaps not surprising. However, although the management practices shown in Table X were the source of some disagreement across industrial sectors and between TQ and non-TQ organizations, the current and future use of the approaches to management outlined in Table XI are almost identical by both industrial sector and by the implementation of TQM.

The above analysis suggests that when the terminology is removed, the aims of most organizations in the sample are remarkably similar, especially given the diversity of operations in the sample organizations. The challenge may then be to develop an integrated set of management practices that fit with the desired approaches to management.

Table XI. *Current and future approaches to management*

Management approaches	Current	Future	Difference
Crisis management	4.0	2.1	1.9
Ad hoc improvement	3.7	2.5	1.2
Reactive management	3.9	2.2	1.7
Continuous improvement	3.3	4.5	–0.8
Customer focus	3.6	4.7	–0.9
Strategic direction	3.4	4.3	–0.9
Innovation	3.1	4.2	–1.1

Figure 11. *Current and future approaches to management*



Conclusions

The above survey confirms that, as well as confusion existing in the literature as to what exactly constitutes business process re-engineering, different organizations and industrial sectors place differing emphasis on the various tools and techniques of BPR. Organizations which have adopted TQM show greater use of strategic and process management techniques, benchmarking and self-assessment, which places them in an ideal position to make use of re-engineering techniques.

When considered on a project basis, however, BPR appears to be less successful at TQ organizations. This is perhaps surprising, but may be due to the expected greater experience in process management of TQ organizations, and a consequent reduction in the scope for improvement. When performance measures are considered, TQ organizations appear to have gained greater improvements than non-TQ organizations.

When the results of the survey as a whole are compared, it can be seen that all organizations in the sample are attempting to move towards proactive, customer-focused performance improvement in their approaches to management. Although some differences exist in the terminology of the precise practices to be used, the approaches desired mirror in many ways the ideal "TQ organization".

That is not to say that many organizations which have implemented TQM significantly are more advanced than non-TQ organizations. Some TQ organizations undoubtedly are advanced in the management of processes and focus on customers[32,33], while others appear to face difficulty in integrating TQM into the management of the organization.

What is clear, however, is that business process re-engineering – by whichever means are deemed suitable on a case-by-case basis – can form an integral part of the management of any organization when used correctly. TQ organizations should be able to integrate BPR with their TQ philosophy, and should reap the rewards of integrating continuous improvement and re-engineering of processes. Indeed, BPR may provide the "kick start" required to get many TQ initiatives on the move again.

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