Business Process Re-engineering, Information Technology and the Productivity Paradox

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Business Process Re-engineering, Information Technology and the Productivity Paradox

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Abstract

Business process re-engineering poses the ability to either combat the productivity paradox or contribute even further to the paradox phenomenon. A likely cause for the productivity paradox is a failure to take full advantage of Information Technology's capacity to change the way work is done. In order to implement re-engineering successfully, new technologies that are suited for the fast changing and dynamic environment within which an organisation functions and that address the softer issues, such as the need to learn more effectively, are needed.

Actual Information Technology payoffs cannot be expected until major elements of organisational and social learning are complete. If people are willing to share ideas and to participate and co-operate in groups, the process of learning new technologies and new ways of doing things will take much faster and will contribute to the demise of the productivity paradox.

Introduction

One of the great things about computers is that it increases productivity when introduced into an organisation...or is this the truth? It seems as if the productivity promises that accompany Information Technology (IT) investment proposals don't come true - therefore the much used term productivity paradox. Although this term has been around for quite some time, new literature indicate that we still encounter the problem, maybe now even more than before. On the other hand we find that business process re-engineering (BPR) advocates indicate that re-engineering is the only way by which we can get greater value from our information technology investments. The question that has to be answered is whether BPR really possesses the ability to increase productivity through the use of information technology, or whether there are other factors that have to be taken into account in order to combat the productivity paradox.

What is the productivity paradox?

The productivity paradox originates from two conflicting viewpoints, namely the expectation that computerisation will produce productivity improvements in organisations on the one hand and economic evidence that contradicts this expectation on the other hand (J L King in Computers and Controversy, 1996, p 239). Notwithstanding huge investments in technology in industries where technology is presumed to provide productivity payoffs, productivity had remained flat. According to Kling (op cit.) reasons
given for the productivity paradox vary a lot - some people assert that there are problems with the measurement of productivity effects from computerisation, while others claim that the numbers might be right, and that computerisation has not yielded major payoffs because managers do not have the skills to implement the technology correctly. Whatever the reason for the productivity paradox, it seems as if computerisation has not yet lived up to the promises made regarding the increase of productivity. Does business process re-engineering hold the answers to the questions about the productivity paradox?

Re-engineering and the productivity paradox

Business process re-engineering is the fundamental rethinking and radical redesign of business processes in order to achieve dramatic performance improvement. Right from the start, Information Technology was a constitutive part of business process re-engineering. Although the advocates of re-engineering agree that technology is not necessarily the most important component of BPR, it seems impossible to think how re-engineering can be achieved without the use of Information Technology. IT possesses the ability to change the way in which work is done, especially when used in innovative ways to improve current processes.

In 1993, Davenport observed that researchers indicated that the likely cause for the productivity paradox is a failure to take full advantage of Information Technology's capacity to change the way work is done. Davenport further states that: *Process improvement and innovation are the best hope we have for getting greater value out of our vast information technology expenditures*... (Davenport TH, 1993, pp 44,45).

On the other hand, Kling (1996, p 254) argues that the complexity of the problem raised by the productivity paradox can be seen even more starkly when: *we realise that technological capabilities powerful enough to alter what we can do will alter our expectations of what we ought to do*. Improved productivity will not result from simply linking the power of technology to an overall organisational strategy.

The question that has to be answered is whether re-engineering in itself can help us to get the payback from Information Technology in order to end the productivity paradox, or whether there is something else that will help us to achieve the necessary payback in order to justify the ever increasing use of Information Technology within the organisation (especially when used to enable new business processes - something that will also help us to achieve greater successes with business process re-engineering itself).

A possible answer

From the previous paragraphs it seems as if the real reasons for the productivity paradox can be attributed to the fact that Information Technology is not applied in the right way - according to Kling (*op cit.*) managers have to make the "right" decisions about application of the technology, while Davenport (*op cit.*) and other advocates of BPR argue that people do not take full advantage of Information Technology's capacity to change the way work is done. Perhaps it is because people do not get the time to learn the
new technologies so that they can take full advantage of the capacity that IT possesses to change the way in which work is done, that contributes both to the productivity paradox and the failures encountered with BPR.

It seems that the problems organisations encounter when conducting business process re-engineering and the questions surrounding the productivity paradox can be attributed to softer issues; issues such as a lack of highly efficient communication skills and the courage, or lack of means, to adapt to new working conditions (Cafasso R, 1993, p 102). In order to implement re-engineering successfully, new technologies that are suited for the fast changing and dynamic environment within which an organisation functions and that address the softer issues mentioned above, are needed.

If people do not have the time to learn the new technologies, it is impossible for them to be productive. This also illustrates why BPR poses a bigger threat to productivity than for example, when only new technology is introduced to the organisation. With BPR people have to adapt to much more than just new technologies - they also have to adapt to a fundamental new way of doing things. It is therefore justifiable to conclude that BPR can even promote the productivity paradox instead of allowing organisations to get greater value out of the vast information technology expenditures.

According to Kling (op cit.) actual payoffs cannot be expected until major elements of organisational and social learning are complete.

**Organisational learning**

The nature of the problem being addressed here demands that the employers and employees of the organisation must be willing to participate in the discussion that forms an integral part of BPR. This implies a certain behavioural culture within the organisation. This culture has to ensure participation and co-operation. If this discussion takes place, employers and employees can both contribute to the search for doing the 'right' things with the new technology (or even to acquire the 'right' technology). The organisation furthermore exists in a complex and continuously changing environment. If the organisation cannot learn from previous experiences and adapt to the changing environment, its existence is in jeopardy. The organisation has to learn the new ways of conducting business in order to put an end to the productivity crisis and successfully implement BPR.

According to Argyris (1990, p 12) humans learn early on to act in certain ways in order to stay in control. These lessons are transformed into action theories. Argyris calls these action theories that people use to stay in control, theories-in-use. The first theory-in-use states that people in organisations act defensively. They want to win and not to lose. It is thus impossible to obtain active participation from the people inside the organisation. They hold back information because it is seen as a trump card that can be used to win. The employers'employees will not be able to work effectively together in groups, and it will be impossible to get them to work together in process teams. The people are not willing to submit their actions and theories-in-use to public criticism. They are therefore
not able to learn from their mistakes in order to avoid repeating the mistakes in future. This implies that learning new ways of doing things as well as learning how to use enabling technologies is going to take much longer, and this in turn contributes to the productivity paradox.

An alternative behavioural culture based on the openness between people is needed in order to successfully implement change inside the organisation. Argyris and Schön (1974, pp 63 - 134) call this alternative behavioural culture Model II. The Model II behavioural culture implies that people are not afraid to submit their assumptions to public criticism. The people are also willing to change their assumptions if they are proven to be wrong. In this way people learn from their mistakes. A transparency that is important for intergroup relations, is brought about. If people are willing to share ideas and to participate and co-operate in groups, the process of learning new technologies and new ways of doing things will take much faster.

It is furthermore important to establish a Model II behavioural culture because it gives rise to a learning organization. People in a learning organization have the ability to adapt much easier to change because they are willing to continually test their theories-in-use in public. In short: A Model II behavioural culture brings about the transparency needed to successfully implement change in a social system. If the techniques and ideas associated with a Model II behavioural culture are applied, it seems as if a faster learning time for new technologies within the organization will be actualized.

The Model II behavioural culture will help to address the following technology issues identified by Kling (op cit.):

* It will speed up the processes of learning-by-doing and learning-by-using. This will hopefully enable people within the organization to learn the applications before changes in the applications occur.

* It will speed up the learning process because new products and processes (enabled by the technology) will be familiar from past learning experiences.

* People will share insights that they have gained about the new technology with one another, enabling the organization to learn and change faster - people will not be tempted to hold back information because they act defensively.

Learning to do new things take time - while this learning is underway, the direct benefits from the learning cannot be exploited. Enabling technologies help us to execute processes in an entirely new way. It is thus very important to be able to learn as fast and effective as possible how the new processes work in order to obtain productivity advantages from the new way of doing things. If the organization fails to learn the new way of doing things fast, it will not have time to adapt to the changes, especially in the fast changing and competitive business environment.

Conclusion
The following conclusions have been reached:

* The productivity paradox is still one of the important issues associated with Information Technology. Business process re-engineering possesses the ability to either combat the paradox phenomenon or worsen the effects of the productivity paradox (especially because of the important role of Information Technology in BPR).

* People do not get the time to learn the new technologies so that they can take full advantage of the capacity that IT possesses to change the way in which work is done - this contributes to both the productivity paradox and the failures encountered with BPR.

* Actual Information Technology payoffs cannot be expected until major elements of organisational and social learning are complete. If people are willing to share ideas and to participate and co-operate in groups, the process of learning new technologies and new ways of doing things will take much faster.

Business process re-engineering in itself doesn't have the ability to combat the productivity paradox. If, however, it is used in conjunction with social transformation techniques, such as organizational learning, the benefits associated with BPR, especially the capacity that IT possesses to change the way in which work is done, have a greater chance of being realized.

List of References

References available upon request from the author.