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# An evolutionary model of continuous improvement behaviour

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## Abstract

In today's complex and turbulent environments the need for continuous improvements in products and processes is widely recognised. But the mechanisms whereby such a continual stream of innovation can be achieved are often less clearly identified. One option is to mobilise a high proportion of the workforce in a process of sustained incremental problem-solving, but experience with this approach suggests that successfully doing so is far from simple. Although many programmes for 'kaizen' or 'continuous improvement' based on employee involvement are started, the failure rate is high. This paper reports on extensive case-study based research exploring how high involvement in continuous improvement can be built and sustained as an organisational capability. It argues that this phenomenon needs to be viewed as a cluster of behavioural changes which establish innovation routines in the enterprise, and presents a reference model for assessment of progress in the evolution of such capability. © 2000 Elsevier Science Ltd. All rights reserved.

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## 1. Resource based strategy

Much current thinking on strategy concerns what is often termed the 'resource-based' model, in which competitive advantage is seen as coming from the particular bundle of tangible and intangible assets to which a firm has access (Kay, 1993; Teece and Pisano, 1994). Accumulating these assets is seen as a key task in strategic management, and the 'core competence' of the enterprise is essentially the outcome of this process (Pavitt, 1990; Prahalad and Hamel, 1994). The more firm-specific and difficult to copy these resources are, the more likely it is that sustainable competitive advantage can be built and maintained.

Resources come in various shapes and sizes but can be grouped into tangible assets — buildings, plant, equipment, etc. — and intangible assets. This latter group is made up of knowledge assets — what an enterprise knows about (its core technologies, its market knowledge, etc.) — and behavioural patterns — how it organises and operates. The important feature here is

that, unlike tangible assets, they are difficult to acquire and copy because they are often the product of extended learning processes. This makes them highly firm specific and a much stronger source of potential competitive (Teece, 1998). As a UK manager put it, "...there is no other source of competitive advantage! Others can copy our investment, technology and scale — but NOT the quality of our people..."<sup>1</sup>

In other words, what makes a firm competitive is not so much the equipment, location, buildings, etc. which it possesses (since anyone with deep enough pockets can duplicate this resource position) but what it knows about and how it behaves. A firm like 3M owes its competitive position to deep *knowledge* (around the fields of coatings and related technologies) which it has built up over nearly a century and to *ways of working* which are particular to the organisation (such as the encouragement of 'bootlegging') which give it the ability to introduce new products on a sustained basis. Both these sets of attributes — the knowledge base and the behaviour patterns — the 'culture' or 'way we do things around

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<sup>1</sup> Managing Director, British Chrome and Steel, cited in 'Partnerships with people', Department of Trade and Industry, London, 1998.

here' — are specific to the company and cannot easily be duplicated.

One of the strongest barriers to imitation is that much of this asset base is a mixture of formal and tacit elements. Although 3M has formal codified knowledge in the form of patents, process designs, etc., much of what it knows is tacit knowledge, held in the experience and 'fingertips' of its employees. In similar fashion although some of its behaviour patterns are formalised into structures and procedures, much of 'the way we do things around here' is essentially tacit, a shared understanding about norms of behaviour and underlying values which have evolved over time.

This paper is concerned with such behaviour patterns and with how particular patterns can confer competitive advantage. They are often described in the literature as 'routines' and there is growing interest in this approach as a way of understanding organisational behaviour. Winter, for example, defines routines as "...a relatively complex pattern of behaviour...triggered by a relatively small number of initiating signals or choices and functioning as a recognisable unit in a relatively automatic fashion..." (Winter, 1986). This is not to say that routines are mindless patterns; as Giddens points out "...the routinised character of most social activity is something that has to be 'worked at' continually by those who sustain it in their day-to-day conduct..." It is rather the case that they have become internalised to the point of being unconscious or autonomous (Giddens, 1984).

Tranfield et al suggest that three sets of routines are important — those concerned with maintaining performance of current processes, those concerned with improving existing processes and those concerned with transforming or changing to new processes. In this article we are concerned with the middle option — routines for incremental innovation, for, 'doing what we do better'. (As we shall see, there is scope for employing such routines to help with more radical innovation but extended discussion of this lies outside the scope of this paper).

Our focus is on the ways in which such behavioural patterns can be built up across organisations to provide operational and eventually strategic advantage through high and regular involvement in the innovation process.

## 2. Routines for continuous improvement

The idea of high involvement in incremental innovation is not new. It is based on the premise that all human beings are capable of creative problem-solving activity (although, as Kirton points out, their preferred behavioural styles may not always lean towards radical expression of such innovative behaviour) (Kirton, 1980). There are many historical examples of encouraging participation in innovative activity — for example, Schroeder and Robinson report on Denny's shipyard in Dum-

barton in the 18...and on experiences in trying to employ the 'hundred-headed brain' at NCR around the turn of the century (Schroeder and Robinson, 1991).

More recent discussion has been strongly influenced by experience in Japan of what is often termed 'kaizen' and which has generally been translated in Western parlance as 'continuous improvement' (CI) (Imai, 1987). Although strongly associated with the 'quality movement' of the 1980s, CI as a concept has roots in many other fields, including Socio-technical systems design, the human relations movement and, more recently, the discussion surrounding 'lean manufacturing'. (Lewin, 1947; Miller and Rice, 1967; Womack and Jones, 1997).

There is considerable and unhelpful confusion in the way the term 'continuous improvement' is used, since it is deployed both as a verb — the process whereby a continuous stream of innovations emerge — and also as a noun, referring to the outcome of that process. Here we are concerned with the latter and particular with looking at CI as a particular bundle of routines which can help an organisation improve what it currently does.

It can be argued that much of the literature surrounding CI does not treat the behavioural aspects of the process well. In particular three major criticisms can be levelled:

- it is often prescriptive and fails to cover implementation
- when it does explore implementation — how to introduce CI — it tends to assume a correlation between exposure to tools (such as the seven quality management tools<sup>2</sup> and CI — and neglects the other elements of behavior building
- it assumes a binary split between having or not having CI, rather than seeing it as an emerging and learned pattern of behaviour which evolves over time.

We suggest that the experience of disappointment and failure with CI programmes reported by many organisations (EIU, 1992) derives in large measure from a lack of understanding of the behavioural dimension. In the following sections we report on a model for understanding and building CI which is based on the concept of development of routines, and the evolution of a strategic capability through this process.

## 3. The CIRCA project

This paper draws on research into CI behaviours under the CIRCA programme — Continuous Improvement

<sup>2</sup> There are many tools available to support quality improvement but, following Ishikawa, seven have been highlighted as a basic set with which to work on problem-finding and solving. These are: cause and effect diagram, scatter diagram, Pareto analysis.

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