



Pergamon

Technovation 19 (1999) 483–493

---

---

**technovation**

---

---

www.elsevier.com/locate/technovation

# Decision support system for the management of systems change

Lawrence Dooley<sup>\*</sup>, David O'Sullivan

*Computer Integrated Manufacturing Research Unit (CIMRU), National University of Ireland, Galway, Ireland*

Received 22 October 1998; received in revised form 15 December 1998; accepted 15 January 1999

---

## Abstract

Through the passage of time, various different approaches such as total quality management (TQM) and business process re-engineering (BPR) have been presented to operations as offering the potential for performance improvement and innovation. These approaches have been implemented across the globe and have had varied results. Approaches have been implemented with huge success in one organisation, only to result in absolute failure in another. The question of 'why does this happen?' has been continually asked by researchers, and opinion points to the presence or absence in the project implementation of specific enablers or levers of change, together with a methodology which incorporates these levers. Researchers state that finding the right change management process can give an organisation a 99% chance of success. This paper looks at five key factors in developing a successful innovation management process that can guide organisations towards achieving performance goals. The five factors are: group management, strategic planning, empowerment, systems engineering and lifelong learning. A new methodology is introduced which gives organisations a step by step approach to implementing the innovation process successfully. The methodology is supported by a set of modelling and analysis tools which help in the design and development of many of the critical success levers. The combination of levers, methodology and tool-kit offers a roadmap to managers and designers for achieving successful performance improvement and innovation within the organisation. © 1999 Elsevier Science Ltd. All rights reserved.

*Keywords:* Change management; Decision support systems; Systems change

---

## 1. Introduction

Every organisation invests significant resources in developing its performance through the introduction of new technology and processes. Research has demonstrated that investments in organisation development often only have a 50% chance of success (Jaikumar, 1986). The difference between success and failure depends on how the change is managed. The greatest cost for the organisation as a result of failure is the loss of morale or an increase in cynicism among employees about future plans, goals or strategies of the organisation. Innovation must be at the kernel of the organisation, not only in respect to aspects such as 'new product development' but throughout all aspects of the business. The operation of all processes should be questioned and innovative change should be sought out and implemented. Any change, which is undertaken by the

organisation, has the potential to become a competitive weapon or corporate millstone. A beneficial change undertaken by the organisation can improve its competitive advantage relating to external and internal competition. This will develop an organisational culture which actively embraces innovative change in order to develop the organisation. This paper examines a number of issues relating to how change is managed within a manufacturing enterprise and the systems and tools which are necessary to support innovative change. It begins with a brief overview of the development of organisational change theory and then examines the key factors essential to creating a good process for systems innovation. A methodology and associated tool-kit are introduced which facilitates organisations in managing innovative change effectively.

## 2. Development of systems innovation theory

The management of innovative change is not something which is new to management attention, but instead

---

<sup>\*</sup> Corresponding author. Tel: + 353-91-750414; fax: + 353-91-562894; e-mail: lawrence.dooley@nuigalway.ie

has been a matter of concern for at least the past century. Table 1 offers a brief synopsis of some of the key milestones that have contributed towards the development of change management within manufacturing. While the change approaches for organisational change discussed in Table 1 do not include all the techniques which are available, they are a sample of the many important approaches which have evolved over time. Each approach has been influenced by the environment in which it was 'born' and the organisational developments that preceded it. Developments in the areas of systems analysis, learning organisations and industrial psychology clearly illustrate that change management has become more sophisticated but also that the process of change management is becoming more clearly defined, as it applies to open systems such as manufacturing enterprises.

The current situation takes on board many of the best aspects of past approaches, together with taking a systems analysis perspective of the organisation. This perspective has been developing over the past decade, with the emphasis shifting from concentration of the individual manufacturing department to the examination of the business processes of the organisation. The current perspective of manufacturing views it as an open system which possesses a number of general systems theory (GST) traits, rather than an entity consisting of a collection of interrelated business processes. These characteristics result in the systems designer viewing the organisation as: (1) goal seeking; (2) holistic; (3) hierarchical; (4) having technical and social subsystems; (5) trans-

forming inputs and outputs; (6) being open systems; and (7) learning organisations. The benefits which are derived from this systems perspective are that it firstly provides the numerous systems designers who are working on different parts of the system with a common way of looking at the system, and secondly allows various subsystems to be treated holistically. Through this, the effort expended in redesigning and developing the manufacturing organisation will have maximum benefit since it is all focused in the same direction.

### 3. The systems innovation process

Innovative change is a necessary part of any dynamic manufacturing organisation. A manufacturing organisation which does not actively seek beneficial change projects will find their competitive advantage eroded away by more aggressive competitors. In today's environment of rapid technological advancement, even proactive organisations who practice continuous improvement programmes (often as part of a world class manufacturing (WCM) or total quality management (TQM) approach) can find themselves slipping behind the more progressive organisations. These organisations often find that continuous improvement is not adequate to sustaining their competitive position relative to the rate of technological change, and that a more 'radical' change initiative is required. Parker (1993) believes that organisational change needs to be 'an explosive mix of dramatic change... which builds on existing change processing

Table 1  
Major approaches to change within the manufacturing organisation

Decade	Approach	Early authority
1690	Division of labour	Adam Smith
1890	Scientific management	Frederick Taylor
1900	Mass production	Henry Ford
1920	Industrial engineering	F. Gilbreth and F. Taylor
1930	Human relations movement	E. Mayo
1950	Japanese quality movement	J.M. Juran and W.E. Deming
1950	General systems theory	K. Boulding
1960	Materials requirement planning	W. Orlicky
1960	Socio-technical design	E.L. Trist
1970	Manufacturing resource planning	O. Wright
1970	Factory focus	W. Skinner
1980	Total quality	P. Crosby
1980	Just in time	T. Ohno
1980	Computer integrated manufacture	
1980	Optimised production technology	E. Goldratt
1980	ISO 9000	NSAI
1980	World class manufacturing	R. Schonberger
1980	Benchmarking	Rank Xerox
1990	Lean manufacturing	Jones and Roos
1990	Learning organisation	
1990	Business process re-engineering	M. Hammer (1990) and T. Davenport

Adapted from McSwiney (1995a, b).

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات