IDEA GROUP PUBLISHING
701 E. Chocolate Avenue, Hershey PA 17033-1117, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com
ITB8057

Chapter VIII

Evaluating Evolutionary Information Systems: A Post-Modernist Perspective

Nandish V. Patel
Brunel University, UK

INTRODUCTION

Until the beginning of the 1990s, information systems (IS) were generally viewed as largely a support for business activity and were justified using cost accounting techniques. A proposed system would be developed if it could be shown that it would reduce operating costs or result in other productivity increases. No consideration was given to other benefits of an intangible or even strategic nature. As the deployment of information technology (IT) spread from operational to tactical support, the need to assess or evaluate its contribution to organisational performance and organisational reconfiguration attracted researchers' interests. Yet the same genre of cost accounting based evaluation techniques were used.

Now, as we enter the new century, IS are regarded as an essential feature of doing business, and many new kinds of businesses, such as Web-based ones, organise their business activity around IT, rather than organise the IT around the business. Executives especially regard IS as strategic tools. We are in an era of Internet-based businesses, reconfiguration of business processes with integrated IT/IS, and traditional businesses which now have to use the World Wide Web to remain viable. In this new era, the approach to IT/IS evaluation is still typically controlled using budgets and year-to-year comparisons, and by comparisons with other business costs such as human resource or production costs. With this plethora of IT/IS deployment, the actual benefits to business of introducing and *using* IS are proving inherently difficult to *measure.*

However, many of the IS in use in modern business organisations may be regarded as *evolutionary information systems* (EIS). It is argued here that EIS cannot be measured using cost-based accounting methods, or methods that seek to quantify benefits and costs in other ways. Instead, an interpretative approach is required that focuses on the subjective utility or value of IS to individuals, groups, or organisations. Such an approach is explored in this chapter.

To characterise evolutionary systems development and EIS some examples are necessary. Examples of evolutionary systems development are prototyping (Bowen, 1994) and Rapid Application Development (Pressman, 1997), amongst others. There are also developments in evolving legacy systems (Warren, 1999) that are at present not considered

in IT/IS evaluation. There is no evidence of evaluation methods that consider the improvement or enhancements made to IS through maintenance activity. The effort spent in systems maintenance, often quoted as sixty to seventy per cent of the cost of systems (Pressman, 1997), questions the value of both ex ante and ex post evaluation. Through maintenance activity it is often the case that the actual IS in operation is significantly different from the one that would have been evaluated before or after it was built. Such activity in systems development and systems usage is here termed EIS.

There are different perspectives on EIS (Land, 1982). An EIS may be a named system that is developed through time. The system changes from its inception through development to operation and final replacement. It may be regarded as the management of IT or IS over a period of time leading to maturity of systems. Finally, an EIS may be seen in a broader context in society, not solely concerned with individual systems, but with the diffusion and growth of IS through out society. A classic example of the latter is the World Wide Web

EIS can be distinguished from other IS along various dimensions, as shown in Table 1. User requirements are a critical distinguishing factor of EIS. Such systems incorporate changing user requirements. Changing user requirements requires changeable systems functionality, which is another critical distinguishing factor of EIS. Both of these factors mean that EIS are adaptable. User requirements and system functionality are normally fixed in non-evolutionary IS.

It is possible to further distinguish EIS from traditional IS with reference to their development method. Traditional IS are developed using some structured method or systems development methodology, for example Structured Systems Analysis and Design Methodology (SSADM) used in the UK by government agencies and some large companies. Yet research shows that, though a particular methodology may be named in systems development projects, it is often not adhered to but is used as a means of social defence (Wastell, 1996). An extensive literature exits detailing methods for evaluating traditional IS. It considers associated problems of quantifying individual or organisational, whether tangible or intangible, second order or third order benefits (Symons, 1991; Farbey et al., 1995; Ballantine, J. et al., 1998; Willcocks & Lester, 1999).

Most IT/IS evaluation research and practice is either done before the decision to invest or after it. This type of evaluation is suitable for methodological information system development, where a system is developed using business projects and system development methods with set budgets and time scales, and where the system is regarded as *completed*. However, it is now recognised that systems development is evolutionary, leading to IS that are classified as evolutionary systems. Examples of such systems are the World Wide Web, Internet, and extranets. Other software systems are designed to evolve too. These are usually found in process based systems development (Warboys et al., 1999).

Traditional measure-oriented evaluation techniques are not suitable for such systems. Consequently, the concept of EIS suggests that we have a class of IS that requires a radically different perspective on IT/IS evaluation. An alternative approach for evaluating EIS is proposed in this chapter as composed of interpretivism (Walsham, 1993; 1995), post

Table 1: Distinction Between Evolutionary and Non-Evolutionary IS

	Evolutionary IS	**Non-Evolutionary IS**
User Requirements	Changing, Ongoing	Established, fixed
System Functionality	Changeable	Fixed, non-changeable
Adaptability	Yes	No