Approaches to Developing Information Systems\textsuperscript{1}

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Abstract Information systems development (ISD) is a core issue of information systems teaching, practice and research. In this chapter we provide a brief history of information systems development and then focus on ISD today, where speed-of-development issues have changed the scene greatly. We look at one approach, Dynamic Systems Development Method (DSDM), in particular as it strikes a good balance between speed and cost issues on the one hand and yet maintains many of the best practices of traditional ISD approaches.

A Brief History of Information Systems Development

In this section we examine some of the trends and issues related to information systems development until around 2000 (we discuss the current situation in the next section). It addresses methodologies for the development of business information systems, or what was called in the early days, data processing. As a result of analysing methodologies from a historical perspective, we have identified a number of specific periods or eras, which we argue have particular, identifiable, characteristics. Although described as eras, this does not mean that they are (or have been) experienced in exactly the same time period by every organisation or indeed every country. This will obviously vary. We break up our history into three eras: pre-methodology, early methodology, and methodology era.

Pre-methodology era Early computer applications, until around the 1970s and even early 1980s, were implemented without an explicit information systems development methodology. We thus characterise this as the pre-methodology era. In these early days, the emphasis of computer applications development was on programming. The two major skills required were that of the computer programmer, to ascertain requirements, and write, test and implement the programs, and the computer operator, to run them on the computer once implemented. The needs of the users were rarely well addressed with the consequence that the design was frequently inappropriate to the application. The focus of effort was on getting something working and overcoming the limitations of the technology, such as making an application run in restricted amounts of computer memory. A particular problem was that the developers were technically trained but rarely good communicators.

\textsuperscript{1} An extended version of this chapter with a case study is provided in: Grant, K., Hackney, R. & Edgar, D. (2010) Strategic Information Systems Management, Andover: Cengage.
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nor did they understand the needs of the business well. There was a distinct ‘gap’ between the technicians and the business users. The dominant ‘methodology’ was rule-of-thumb and based on experience. This typically led to poor control and management of projects. For example, estimating the date on which the system would be operational was difficult, and applications were frequently delivered late. The programmers were over-stretched, and spent a large proportion of their time correcting and enhancing the few applications that were operational. Most emphasis was necessarily placed on maintaining operational systems to get them right, rather than developing new ones. These problems led to a growing appreciation of the desirability for standards and a more disciplined approach to the development of information systems in organisations. It was also realised that having users and the business liaising directly with the implementers (programmers) was not the most effective approach. Thus the first information systems development methodologies were established.

**Early methodology era** As computers were used more and more and management was demanding more appropriate systems for their expensive outlay, it was felt that this rather ad hoc approach to development could not go on. There were four main changes:

1. There was a realisation that information systems needed to deliver value for money in a business context, with a calculation of the expected costs and proposed benefits.
2. There was a growing appreciation of that part of the development of the system that concerns analysis and design and therefore of the potential role of the systems analyst as a link to the business as well as that of the programmer.
3. There was a realisation that as organisations were growing in size and complexity, it was desirable to move away from one-off solutions to a particular problem and towards more integrated information systems.
4. There was an appreciation of the desirability of an accepted methodology for the development of information systems.

These changes led to the evolution of the Information Systems Development Life Cycle (ISDLC) as the approach to the development of information systems. This was an early methodology, although at the time it was not yet known as such. An information systems development methodology is defined by Avison and Fitzgerald [1] as: ‘a recommended means to achieve the development, or part of the development, of information systems based on a set of rationales and an underlying philosophy that supports, justifies and makes coherent such a recommendation for a particular context. The recommended means usually includes the identification of phases, procedures, tasks, rules, techniques, guidelines, documentation and tools. They might also include recommendations concerning the management and organisation of the approach and the identification and training of the participants’.

The early-methodology era was characterised by an approach to building computer-based applications that focused on the identification of phases and stages that it was thought would help control and enable the better management of systems