Dysfunctional Development Pathways of Information and Communication Technology: Cultural Conflicts

G ROLAND KAYE, Open University Business School
STEPHEN LITTLE, Open University Business School

This paper argues that there are three factors, which counter the inevitable movement towards globalisation. Firstly the incremental force of technology as illustrated by the growth stage model of the development of Information and Communication Technology (ICT) is flawed. This model implies a linearity of development and an inevitability of stage following stage. While this stage model may provide historic explanation for the development in the developed world and amongst the mature users, the model fails when used predictively for the developing nations or for the late adopters. Secondly the imperialism of technology overcoming all barriers fails to reconcile the cultural dimensions of both the developing context or the application domain. Technology is not culturally neutral but is developed in a cultural context and in the case of information rich applications carries that cultural within its design. Applications of culturally developed systems, such as office and management systems assume the user’s compliance with the design culture, but this inevitably leads to cultural clashes as we apply outside the design context. Thirdly the assumption of universality of economic access and development is incompatible with both the reality and development paths in both developed and developing countries. This inevitably will lead to a divided society split between the internationally mobile, technology-supported communities and those communities disadvantaged economically and technologically but culturally rich. The failure to bridge this gap may leave society as a whole weakened through lack of access to ‘variety’. The paper discusses these perspectives and illustrates the case with evidence from NE Asia and the United Kingdom. In particular it focuses on software development and information-rich contexts.

Technological Inevitability - Growth Stage Model

Gibson and Nolan (1974) provide a growth stage model (GSM) of the development of Information and Communication Technology (ICT). The initial model had four stages: Initiation; Expansion; Formalisation; and Maturity.

Nolan (1979) extended this model to a six-stage model reflecting recognition that there were more sub stages reflecting the growth of knowledge and technology from the implementations. The model reflected not only a shift in the objectives being sought (explanation of budgetary expenditure on ICT) but the involvement of management and the control and orientation of the evaluation. The revised model (fig 1) demonstrates a balance between slack permitting growth and innovation and phases of control ensuring cost effectiveness and integration. The rate of growth inferred in the graph below is quite gentle but for many the actual rate is explosive causing problems of control. The stages reflected distinct categories of evolution from batch processing through time-share data processing, to PC’s and networks of communicating processors. With hindsight that may have been the experience of the larger US companies who had been involved with computers from the early days. This could not be described as the experience of the later entrants often small and medium enterprises (SMEs) whose first foray into the arena came with turnkey and proprietary software or the more recent entrants with commodity based PC’s and software.

Friedman (1994) suggests that GSM is not purely a description but rather reflects a dynamic process embracing all of the stages and dictating their order of appearance. It is the “likely crises in the organisation’s experience of computers” and management reactions to large scale and poorly understood technical events and organisational change. Friedman suggests that the underlying emotional characteristics are:
• Caution when dealing with unfamiliar subsidiary issues
• Optimism that follows success
• Pessimism that follows disappointment
• Balance that follows experience of variations.

GSM inevitably suggests a product life cycle S-curve but perhaps the difficulty encountered with the model rests with the lack of separation of the life cycles of individual component technologies from the longrun product life cycle. If we select any phase within the model we find that this incorporates several technologies of which are in maturity others that are only emergent and some are expanding. This overlapping of life cycles confuses the long-term trend as some technologies superseded stepwise changes, other technologies were additional (fig 2). In the early phases certainly many hardware developments led to straightforward replacement but later complex networks developed involving several generations of hardware and likewise software.

One area where the proliferation of technologies may be found inter-working is the office in which office automation has not replaced but rather led to increasing varieties of technologies used to perform overlapping tasks. Only recently have we seen attempts at reducing the redundancy and integration of the technologies of printers, faxes, copiers and scanners. This represents the micro-level of the problem represented by the “information archipelago” of MacFarlan and McKenney (1982) in their extension of Nolan’s model to office automation in general.

The GSM model purports to provide identifiable stages and identifiable categories. However the empirical evidence to this position is lacking and the underlying time dimension, as expressed in age of IS function, does not correlate. Despite the evidence from, Drury (1979, 1980, 1983), Benbaset et al (1984) the model continues to be used either explicitly or similarly: Galliers and Sunderland (1991), Jayasuriya (1993), Wastell and Sowards (1995) to project and suggest development pathways for ICT. Friedman suggests the continued usage reflects:

1) The only explicit model of time pattern of IS function development.

2) Clear and testable hypothesis
3) Prescriptive content
4) The model does summarise some experiences of organisations.

Alternate Models

Earl (1996) accepts the prescriptive nature of the GSM model, and argues for its use to judge the balance between users focus and specialist focus as a measure of technological maturity. Mature use should by now be common, yet the “productivity paradox” arising from the lack of correlation between performance measures and IT expenditure suggests that the mature phase itself is either elusive or extremely varied in outcome. Brynjolfsson and Hitt (1993) and Brynjolfsson et al (1994) offer evidence that productivity gains are achievable ultimately, reflecting a tendency towards smaller IT driven organisations.

Friedman with Cornford (1989) divided the history of Information Systems (IS) into a series of phases reflecting the domination of a particular problem that was seen as a constraint on computerisation. They separated the phases into: hardware capacity constraints - until mid 1960s; software productivity constraints - mid 1960s to early 1980s; user relations - early 1980s to 1990s; and, organisation environment constraints- 1990s and on. Friedman (1994) suggests these phases may be seen as overlapping but with increasing stretch resulting in the shift in the location of IS control. He argued that at the boundary between the phases there was mediation between the respective environments. This shift in control demonstrates how IS reaches out to seek to control and influence its boundaries as each problem or constraint is overcome.
7 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage:
www.igi-global.com/article/dysfunctional-development-pathways-information-communication/3532?camid=4v1

www.igi-global.com/e-resources/library-recommendation/?id=2

Related Content

An Empirical Study of Determinants of E-Commerce Adoption in SMEs in Vietnam: An Economy in Transition
www.igi-global.com/article/empirical-study-determinants-commerce-adoption/67583?camid=4v1a

High-Tech/Low-Tech: Appropriate Technologies for Developing Nations
www.igi-global.com/article/high-tech-low-tech/51307?camid=4v1a

E-Government, Democratic Governance and Integrative Prospects for Developing Countries: The Case for a Globally Federated Architecture
www.igi-global.com/chapter/government-democratic-governance-integrative-prospects/28607?camid=4v1a

A Study of the Attitudes of Indonesian Managers Toward Key Factors in Information System Development and Implementation
www.igi-global.com/article/study-attitudes-indonesian-managers-toward/51313?camid=4v1a