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Evaluating contingency approaches to information systems design

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Abstract

The search for contingency approaches to information systems design (ISD) began in the early 1980s when it was recognised that there is no single best methodology for all ISD projects and when there existed heterogeneous methodologies to select from. Twenty years later, there is now in the IS field not one, but three contingency approaches: 'contingency at the outset', 'contingency with a fixed pattern', and 'contingency along development dynamics'. While the variety of contingency approaches provides IS developers and users with richer insights and greater flexibility to tackle diverse, complex and uncertain ISD situations, to realise the promises and potential benefits of these approaches demands further research on at least three questions: the question of 'which contingency approach', the question of rigor, and the question of cultures. © 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Information systems design; Contingency approaches; Multiview; Culture

1. Introduction

The search for contingency approaches to information systems design (ISD) began when it was recognised that (1) there is no single best methodology for all ISD projects/situations and (2) there exists a variety of methodologies to select from.

This paper suggests that the search has so far produced three kinds of contingency approaches, namely: contingency at the outset (choosing a single methodology or a fixed combination of methodologies for the whole lifecycle of an ISD project), contingency with a fixed pattern (selecting methodologies according to a conceived linear working sequence of human-technical issues in the ISD process) and contingency along development dynamics (employing various methods and tools as the dynamic complexity of ISD unfolds).

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The development of contingency approaches in such a historical order is not accidental but was informed by the failures (and successes) in ISD practice in the last twenty years, as well as by advances in other disciplines such as sociology, organisation studies, cognitive sciences, systems and management sciences (see, e.g., Burns & Stalker, 1961; Child, 1984; Flood & Jackson, 1991; Galbraith, 1973; Kast & Rosenzweig, 1981; Lawrence & Lorsch, 1969; Perrow, 1973; Pugh & Hickson, 1976; Thompson, 1967).

This paper is not particularly concerned with the wider debate since the 1970s on the contingency approach to organisational management in general (for an introduction to that significant debate see, e.g., Donaldson, 1985, 1995, 2001); rather, it will mainly address the on-going search in the field of information systems for flexible, rigorous and workable design approaches.

Further, the paper will not present the details of each contingency ISD approach (interested readers may consult related materials listed in the references). The major objective of the paper is to bring together and present to the IS community an overview of the variety of such approaches, to surface their assumptions, to analyse similarities and differences, and to suggest directions for further research.

2. Contingency at the outset

As early as 1981, it was established that one serious deficiency in ISD is the lack of recognition that different projects require different development approaches. No longer could developers apply the same development methodology to all ISD projects, systems or situations. The ability to choose the most appropriate methodology or a combination of methodologies to fit a particular case was seen as increasingly important (McFarlan, 1981).

The issue of selecting methodologies became more realistic and urgent when the prototyping methodology became available in the early 1980s in addition to the more traditional system life cycle methodology (SLCM). It is further claimed that there was a third methodology: a 'mixed methodology' that integrated 'the best' of the two methodologies—SLCM and prototyping (Alavi, 1984a, b; Alter, 1977; Boar, 1984; Dennis, Burns, & Gallupe, 1987; Earl, 1982; Gorry & Scott Morton, 1971; Martin, 1982; Naumann & Jenkins, 1982; Naumann, Jenkins, & McKeen, 1980). The major rationale behind the favouring of combined methodologies at that time was usually that complementary use of prototyping might help clarify user requirements, especially during the initial analysis phase of the formal SLCM process (Alavi, 1984a, b; Gorry & Scott Morton, 1971).

As selecting methodology(ies) became realistic and necessary, approaches that assist and guide such a selection needed to be, and indeed have been, sought. These approaches have, since then, often been called contingency approaches; some prefer other names, e.g., 'situational approaches' (Saarinen, 1990).

The type of contingency approaches available at that time reflected an assumption that it is possible and necessary to classify system (project) types and to match them with corresponding development strategies. I call this kind of approach 'contingency at the outset', since it emphasises (1) selecting a single methodology or a fixed combination of methodologies before developers begin their project, and (2) subsequently following the same selected methodology or combination

throughout the whole project process (see Davis, 1982; Gorry & Scott Morton, 1971; Naumann & Davis, 1978; Naumann et al., 1980).

The best-presented contingency approach of this kind might be Burns and Dennis (1985) and Louadi, Pollalis and Teng's (1991) two-dimensional framework (illustrated in Fig. 1). The advocates of this framework consider uncertainty and complexity to be inherent characteristics of the development of information systems and therefore propose to classify system types according to these two dimensions: project uncertainty and project complexity. Along the first dimension, they use three contingencies to determine project uncertainty: degree of structuredness, degree of user-task comprehension and degree of developer-task proficiency, while along the second dimension, they use four contingencies to determine project complexity: project size, number of users, volume of new information, and complexity of new information production (Davis, 1982; Davis & Olson, 1985; Ginzberg & Ariav, 1986; McFarlan, 1981; Naumann & Davis, 1978).

According to the conceived 'high' and 'low' complexity and uncertainty, then, transaction processing systems (TPS), information reporting systems (IRS), end-user developed applications (EUDA) and decision support systems (DSS) are located as representatives in the four boxes of the two-dimensional framework.

It is further suggested that, for one thing, the greater the uncertainty of a project, the greater the need to use iterative requirements determination strategies such as prototyping; for another, the more complex a system, the greater the appropriateness of a structured, SLCM-like, methodology. Based on the interaction of the two dimensions, the advocates argue, high complexity–low uncertainty projects (e.g., TPS) should be tackled by SDLC complemented by Level-1 prototyping (prototyping user interfaces), high complexity–high uncertainty projects (e.g., IRS) by SDLC complemented by Level-2 prototyping (prototyping user interfaces as well as record and file interactions), low complexity–low uncertainty projects (e.g., EUDA) by Level-3 prototyping throughout (prototyping from the beginning to the final system), low complexity–high uncertainty projects (e.g., DSS) by Level-3 prototyping complemented by SDLC (for the 'levels' of prototyping see Cerveny, Garrity, & Sanders, 1985; Johnson, 1983).

The 'contingency at the outset' approach provided an urgently needed rationale and model for choosing ISD methodologies (SLCM, prototyping, and various combinations of the two) for different systems types. There are, however, two inherent problems in it. First, the approach is fundamentally technology-oriented, lacking a 'people focus', a crucial factor for successful ISD

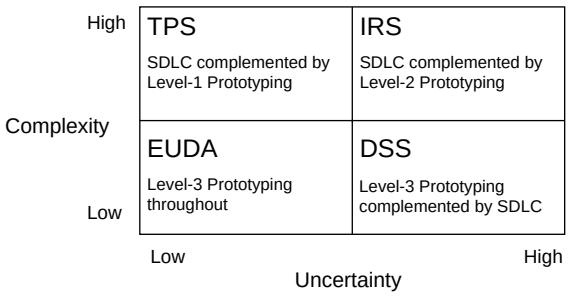

Fig. 1. A two-dimensional model for selecting a methodology at the outset (source: adopted from Louadi et al., 1991; Burns & Dennies, 1985).

(McLeod, 1992). Second, IS projects may take on different characteristics as they progress, rendering a choice at the outset unviable (Avison & Taylor, 1997). Due to these deficiencies, it has been found (Saarinen, 1990), that organisations often choose methodologies 'inconsistently' with the recommendations from contingency approaches of this sort.

3. Contingency with a fixed pattern

The best-known form of this second kind of contingency approaches, particularly in the UK, can be found in Multiview (Avison & Wood-Harper, 1990, 1991). Multiview can be seen as a development based on a conscious reflection on the deficiencies of 'contingency at the outset'. From the Multiview perspective, complex situations are usually so because of the mix of human, social and organisational complexity as well as technical difficulties that underlay the ISD process. Therefore, Multiview suggests, techniques and tools should be chosen according to particular problem situations and issues in ISD—not at the outset, but at each individual stage, of a project. Indeed, the Multiview five-layer framework and five-stage methodology manifest an effort to combine differing tools, techniques, methods, models, paradigms, 'hard' and 'soft', human-focusing and technology-oriented, etc., to assist in dealing with dominant issues at different ISD stages.

Multiview directs developers' attention to five key questions: (1) How is the computer system supposed to further the aims of the organisation installing it? (2) How can it be fitted into the working lives of the people in the organisation that are going to use it? (3) How can the individuals concerned best relate to the machine in terms of operating it and using the output from it? (4) What information system processing function is the system to perform? (5) What is the technical specification of a system that will come close enough to doing the things that have been written down in the answers to the other four questions?

Accordingly, the five Multiview stages are: (1) analysis of the human activity systems, (2) analysis of the information (entities and functions), (3) analysis and design of the sociotechnical system, (4) design of the human-computer interface, and (5) design of the technical aspects.

The order of these stages is, the advocates claim, influenced respectively by the advanced works in sociology and systems-management sciences, as well as by more conventional, structured ISD approaches, e.g., action research (Checkland & Scholes, 1990), ETHICS (Mumford, 1995), rapid application development (Martin, 1991), SSADM (Ashworth & Goodland, 1990) and business systems planning (IBM, 1975).

Compared with 'contingency at the outset', Multiview stresses that (1) human issues are as crucial as technical design, (2) no single methodology can handle them all, therefore, (3) diverse methods are needed, and (4) different methods should be chosen and employed according to major issues in different stages and situations, not to the 'system type' of a project as a whole (Fig. 2).

Obviously, Multiview intends to provide developers with greater flexibility for dealing with diverse ISD situations, since the approach does not require developers to define the characteristics and hence the 'system type' of a project at the outset, a task becoming more and more difficult and unrealistic given the increasing uncertainties and complexities in the development environment, in the 'system' itself, and in the knowledge, skills, cognitive abilities and power relations of and

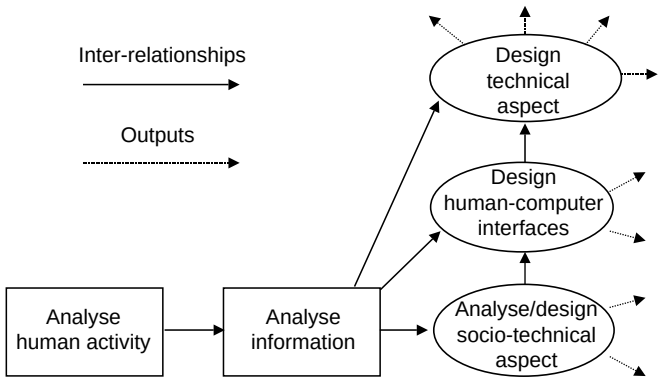

Fig. 2. Multiview1: a five-stage methodology (source: adopted from Avison & Wood-Harper, 1991).

among developers, as well as end-users. Therefore, the intention of Multiview should be very much welcomed.

The problem of Multiview, however, lies in the 'waterfall model' in its linear conception of the working sequence of human and technical issues. While Multiview suggests employing methods contingently according to different issues, i.e., social, organisational, human, or technical, its image of the working of these issues is not so contingent, but static. In Multiview, the issues, problems, tasks and methods are arranged always along the same, prescribed, fixed path.

The linear image is not the result of a misreading of the approach by methodology users, but pushed forward clearly and forcefully by the advocates themselves, in a manner that can hardly be mistaken or ignored. As recently as 1995, it was claimed that

> Multiview … incorporates these ['soft'] ideas as a first stage towards developing a computer information system, and later stages are more influenced by a 'hard' systems viewpoint. … The five stages move from the general to the specific, from the conceptual to hard fact and from issue to task (Avison & Fitzgerald, 1995, p. 42 and p. 377).

As real ISD situations are hardly as well-ordered as this image describes, it is not surprising that the recommended Multiview procedure has invited questions and criticism (see, e.g., Jackson, 1992, 1997).

To overcome this difficulty, or, to become more 'contingent', the advocates have recently 'redefined' their approach. The result is Multiview2 (Avison, Wood-Harper, Vidgen & Wood, 1996). In Multiview2, 'the five stages have been reduced to a four-box structure' (Avison & Taylor, 1997, p. 78), which can be illustrated in Fig. 3.

It is not clear whether the word 'reduced' can be understood as 'replaced'. What is clear is that, in this 'reduced' form, 'Multiview offers an exploratory though perhaps not systematic guide to any information systems development intervention' (Avison & Taylor, 1997, p. 79).

In other words, Multiview is no longer a methodology but merely a 'framework' since, by definition, a methodology should have, as a key component, distinct procedures for action, as the Multiview advocates themselves once agreed—'[a methodology is] a system of procedures, techniques, tools and documentation aids …' (Avison & Fitzgerald, 1995, p. 10; as cited in Avison & Taylor, 1997, p. 73).

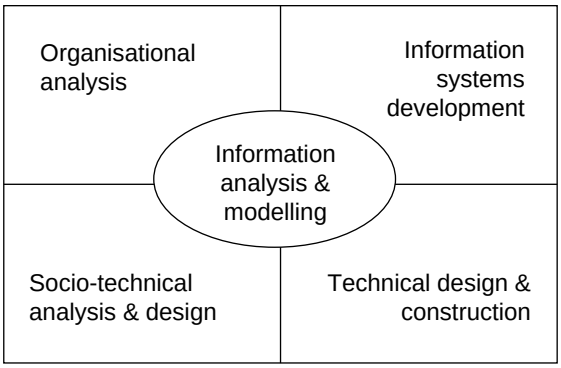

Fig. 3. Multiview2: a four-box framework (source: adopted from Avison & Taylor, 1997).

Actually, there are more confusions regarding 'what Multiview is', even in the advocates' own minds. Is it an approach, a methodology, a framework, or merely a metaphor (see, for example, Avison & Wood-Harper, 1991; Avison & Taylor, 1997; Watson & Wood-Harper, 1995)? Sometimes, Multiview is said to be all these 'things', albeit one at a time. On some other occasions, it is argued to be not a methodology at all (for the debate on these confusions see, e.g., Jackson, 1992, 1997; Watson & Wood-Harper, 1995).

In the view of this author, the confusions around Multiview cannot be easily clarified by a 'reduction' from stages into boxes, or by playing of words (e.g., definitions of those 'things'). As long as one holds an isolationist and static view of human vs. technical issues, there is no any other options but to choose either a prescribed, fixed, 'social issues first—technical design later' sequence, or no methodological procedures at all.

4. Contingency along development dynamics

An approach has recently emerged in the East that presents what I call 'contingency along development dynamics', in that the approach moves a further step to admit that various issues that shape ISD do interact continuously with each other in an unpredictable manner, which, like it or not, can only be appreciated and tackled at each unique development moment, as the complexity of ISD unfolds, rather than in a prescribed sequence.

The approach is called *Wuli-Shili-Renli,* or WSR for short. *Li*, the key concept of the approach, is in Chinese both a noun and a verb. When translated into English, *li* means essence, organism, order, logic, pattern, tendency, principle, reason, reasoning, investigating, engaging, managing, responding, coordinating, caring, etc. *Li* also denotes human knowledge about all these 'things', actions and interactions.

There are multiple *li*s that are different manifestations of the general *Li*—the *Tao*. *Wuli* presents regularities and principles that form and govern the material-technical aspects of the world. *Shili* denotes the psycho-cognitive dimensions of human activity, i.e., the ways individuals as well as groups choose to see, to think, to model, to present and to act. *Renli* highlights the social-political

relations in human life, i.e., patterns of motivation, negotiation, communication, power structuring, value shaping, love and hate, confrontation and co-operation, etc.

The WSR theme has been deeply ingrained in the Chinese life. It can be traced back to an ancient Confucian classic, *Da Xu* (*The Great Learning*), in which 'Eight Wires' were set for the Chinese as a Bible for acquiring sageliness within and kingliness without. The Eight Wires are: investigating things, extending knowledge (in the WSR reconstruction these two are grouped into *wuli*), making the thought sincere, rectifying the mind, cultivating the self (these three are grouped into *shili*), regulating the family, ordering the state and harmonising the world (these three are grouped into *renli*). The Eight Wires and hence the WSR theme, commonly held by the Chinese, thus have ontological, epistemological, methodological as well as moral implications.

To WSR, all real-world situations and hence ISD projects can be pragmatically seen as conditioned by the continuous interplay of *wuli* (relations with the world), *shili* (relations with the mind) and *renli* (relations with others). In conducting projects and doing management, we humans are, ideally, inquiring into three action domains: to investigate and model *wuli*, to be concerned with and reflect on *shili*, to coordinate and harmonise *renli*. Rather than replacing the domination of *wuli* with any other domination, WSR urges participants to embrace all *wuli, shili* and *renli* considerations, concerns, models and perspectives into a communicative dialogue, and accordingly search for appropriate methods to address various *li*s.

Differentiated as they are, *li*s are always interacting with and ever conditioning each other. In ISD terms, technical problems and social issues usually penetrate and transform each other. *Wuli*, e.g., computer networks and the Internet, continuously shape how we humans interact with the world as well as among ourselves. *Renli*, e.g., power structures, dictate not only our ethical conceptions of how IS should work but also our 'technical' decisions on what equipment to purchase, where, from whom and why, etc. Our conceptual ways of situation-framing, sense-making, meaning-sharing as well as value-shaping, i.e., *shili*, are underlain by technological (*wuli*) and power (*renli*) conditions, as much as they are transformed by new knowledge we obtained during our learning process (Fig. 4).

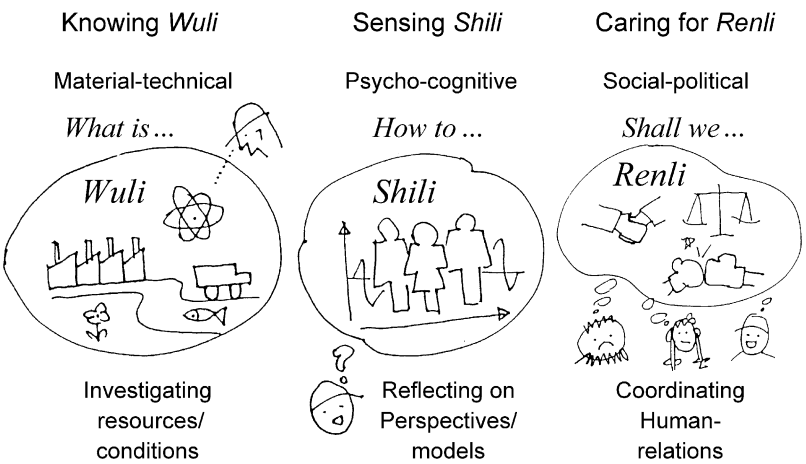

Fig. 4. The philosophy of WSR (source: Zhu, 2001, p. 76).

It is not new, in the East as well as in the West, to see ISD in particular and human activities in general through a multidimensional model (see, for example, Churchman, 1979; de Raadt, 1989, 1995; Linstone, 1984, 1999; Mitroff & Linstone, 1993). What is new in WSR is the emphasis on the unpredictably dynamic interplay of the multiple dimensions, perspectives and actions.

Metaphorically, W, S and R are seen as bubbles. Like the dancing up of bubbles in water, the behaviours, interactions and mutual influences of and among W, S and R are highly uncertain, unpredictable, always breaking away from any sort of prescribed sequential order. It is neither realistic nor productive to deal always with a single particular kind of issue first and with other kinds later. Fixed orders can only be found in textbooks, not in the real world.

Methodologically, to handle this 'bubble dynamics', WSR does not adopt the established and fashionable (in the West) 'social-technical' or 'soft–hard' sequence. Rather, ISD activities in WSR are arranged based on a deep-underlying pattern, according to which humankind are concerned with, try to answer, and subsequently seek plans and take actions with regard to a few key questions.

First, participants in a concrete situation, motivated by desire for change, improvement, the reduction of uncertainty, etc., are encouraged to express what they feel and what they want, asking the question, 'what do we need'? Next, participants focus on investigating what resources they can deploy and what constraints they have to tackle in order to realise the expressed desires, answering the question, 'what do we have'? Then, by comparing the desired and the existing, users may be able to specify what is feasible, discussing the question, 'what shall we have'? The following stages are concerned with converting the feasible requirements into a structured solution (what shall we do?), putting the solution plan into operable configurations (how shall we do it?), and evaluating the outcome obtained, the methodology employed, and what participants have learnt from the whole process (how well have we done?). The element of 'coordinating relations' demands that the discussion and tackling of those questions should be conducted in a collective way, collective in terms of resources, expertise, opportunities, agendas, etc.

Thus, in WSR, the *wuli–shili–renli* interplay on the one hand and the ISD operational stages on the other are conceived as constituting a *li*-stage matrix. Based on the matrix, developers are guided to go through the ISD process in a spiral manner, always preparing to tackle W, S, and R simultaneously at any ISD moment, not in a linear '*renli* first–*wuli* later' order (Fig. 5).

WSR even suggests that an IS solution should not be presumed at the outset. Rather, participants are encouraged to engage in each problem situation such that any project is but a small round of the wider, never-ended, spiral general problem-solving (GPS), i.e., organisational management, process. Projects thus do not necessarily begin as ISD ones, and logically the WSR methodology should not take an ISD form or language by default. Only when participants reach an appreciation that an IS solution is needed and that a formal ISD methodology is meaningful, should the GPS-ISD transformation be intentionally pursued. The transformation is possible because, to WSR, general management (GPS) and ISD processes are but varying manifestations of a similar underlying logic (Fig. 6 and Table 1).

Then, due to the specific requirements of ISD, when transformed into an ISD form, each WSR stage can be further divided into several more manageable steps, which can be intentionally geared towards incorporating available activity elements from various ISD methodologies. For example, the 'information needs appreciation' stage can be arranged into three steps: exchanging feelings and concerns, expressing desires, exploring possible solution options; the condition analysis stage

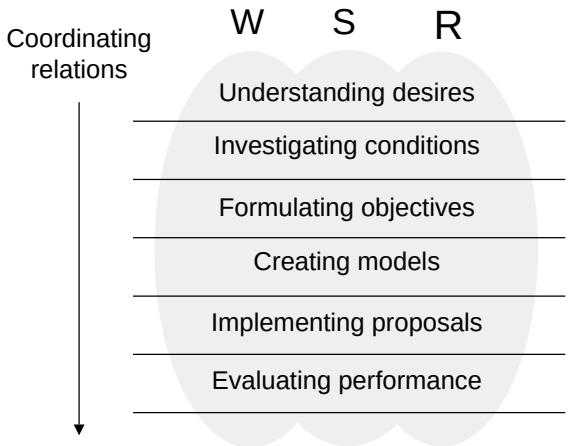

Fig. 5. The WSR *Li*-stage matrix.

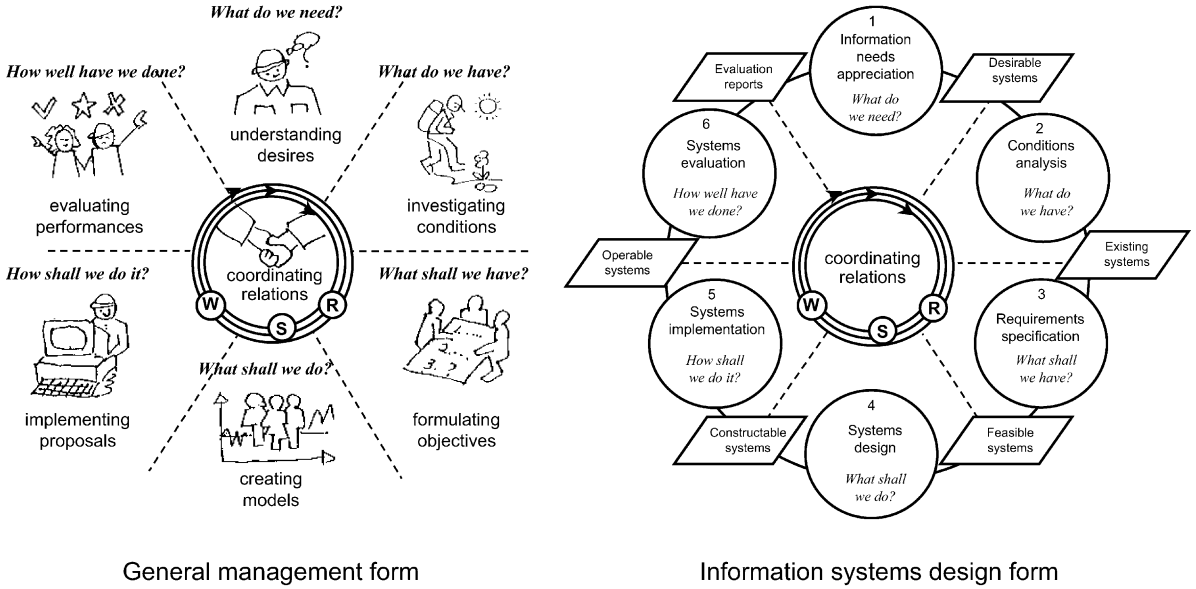

Fig. 6. Isomorphism: the GPS and ISD forms of the WSR methodology (source: Zhu, 2001, p. 82).

into four steps: planning investigation, framing situations, discussing findings, writing reports; the system design stage into six steps: logical design, physical design, testing design, conversion design, training design, evaluation design, etc.

In each WSR stage or sub-step, participants should, ideally, be able to access whatever methods, techniques and tools they consider appropriate. For example, information needs appreciation can be assisted by techniques and tools such as interviews, questionnaires, brainstorming, rich pictures, conceptual models, data flow diagrams, flow charts, prototyping,

Table 1
Underlying logic, GPS and ISD forms of WSR (source: Zhu, 2001, p. 83)

Underlying logic	GPS form	ISD form
What do we need?	Understanding desires	Information needs appreciation
What do we have?	Investigating conditions	Conditions analysis
What shall we have?	Formulating objectives	Requirements specification
What shall we do?	Creating models	Systems design
How shall we do it?	Implementing proposals	Systems implementation
How well have we done?	Evaluating performance	Systems evaluation
	Coordinating *wuli–shili–renli* relations	

demonstrations from suppliers, visiting organisations in the same industry, seminars by managers, professionals, users, etc. At the beginning, no method should be excluded; at the end, no method by itself can be sufficient. Users are encouraged creatively to apply various methodologies, in whole or in parts, as long as they consciously surface and make transparent the basic assumptions of those methodologies, models, techniques and tools. Indeed, participants are urged to take WSR as merely a starting point for learning and empowering. As they become familiar with the multidimensional and dynamic conception of ISD, users are encouraged to move beyond WSR, so as to create a unique methodology for each ISD situation (for the WSR philosophy and ISD applications see Zhu, 2000, 2001, 2002).

5. Unanswered questions

The task set for this paper is modest—to bring together, and inform the IS community about, the variety of existing contingency approaches. In doing so, the paper may have raised many unanswered questions, of which three are briefly addressed below.

5.1. The question of 'which contingency approach?'

The core message of this paper is that, in the IS field, we now have not only a variety of ISD methodologies to select from, but also a variety of contingency approaches that intend to guide how those methodologies are selected, combined and applied. This second variety provides IS developer and users with more choices, while at the same time demanding considerations and decisions at a higher conceptual level, the 'meta-contingency' level. Which contingency approach should we adopt? Is one of the approaches always more meaningful than the other? If yes, which one, and why? If not, should we adopt the contingency approaches contingently in different ISD situations? If so, what are the determining contingencies that we should look at in making such decisions? Or, shall we not necessarily pick up one contingency approach while turning down the others, but draw the 'best insights' from all these approaches, even for the same project, so that our ISD becomes better informed?

5.2. The question of rigour

The purpose of contingency approaches is to provide developers with flexibility for tackling complexity and uncertainty in ISD. However, flexibility alone may not necessarily be the solution; it can be the path to other problems. It might become an invitation to anarchism. Without being checked, 'the very promotion of flexibility can be seen as at odds with the concept of rigour and hence even with the idea of "method" itself' (Rackley, Webb & Betts, 1998, p. 170).

The more flexibility an approach provides, the more challenging the question of rigour might become. With 'contingency at the outset', once it has been decided which technology-oriented ISD methodology to adopt, rigour is, logically if not practically, no longer a problem: one can, and indeed must, follow the associated set of principles, procedures, tools and control measures, which are there exactly to ensure rigour. With 'contingency with a fixed pattern', one obtains, ideally, increased flexibility, i.e., 'hard' methodologies to solve technical problems as well as 'soft' ones to manage human issues, at different ISD stages. However, whether an ISD difficulty at hand is a technical or a human one is largely a subjective judgement usually impossible to be made or agreed upon in a 'rigorous' manner. As to 'contingency along development dynamics', ISD appears to be treated more like an artful activity that demands difficult-to-codify-and-measure knowledge, skills and conducts, rather than as an engineering discipline which should, by definition, be rigorously controlled. May be, in terms of the previous question, rigour is one of the dimensions in considering 'which contingency approach'?

5.3. The question of culture

It is interesting to notice that the three contingency approaches were developed in different cultural contexts: 'at the outset' in North America, 'with a fixed pattern' in Europe, and 'along development dynamics' in China. Do cultures have a role to play in shaping the 'personalities' of these approaches?

There may be some patterns to discern. The technical orientation of the 'outset' approach appears to fit well with the performancism that dominates the industrial culture in North America. It looks equally natural, given the deep-ingrained, outstanding critical and humanistic spirit in the European intellectual tradition, that Multiview incorporates human issues, social concerns and organisational, behavioural factors firmly into the ISD agenda. As to WSR, its 'interconnectedness' view of ISD, its 'bubble dancing' metaphor, its cyclical perception of activities, its preference for user-friendly language over technical jargon, and so on, seem to reflect the unique temperaments of Confucian pragmatism and Taoist naturalism. If such an analysis is reasonable, then national cultures can be another candidate dimension of the 'which contingency approach' question.

Some research has been done on the influence of national cultures on IS. For example, Martinsons and Westwood (1997) discuss what they call the 'misfit' between management information systems and the paternalism, personalism and high context communications in the Chinese business culture. Boisot and Child's (1996) work, although not particularly targeted at the IS discipline, analyses the tendency in the Chinese culture to resist the codification of information, law and regulation, suggesting that the Chinese may take a unique route towards capitalism. So far, these works have focused exclusively on the relationship between national

cultures and information systems at the macro level, leaving the micro issue, i.e., the influences of national cultures on ISD situations and processes, unexplored.

Detailed discussion of these unanswered questions is beyond the target of this paper. Nevertheless the questions may deserve further research in order to realise the potential benefits of the variety of contingency approaches.

6. Conclusion

As developers and users face the increasing uncertainty and complexity in ISD situations as well as the wide range of heterogeneous ISD methodologies, contingency approaches that assist in selecting, combining and applying appropriate methodologies have been insistently sought. Today, there has in the IS field developed not one, but a variety of contingency approaches, of which three are discussed in this paper: contingency at the outset, contingency with a fixed pattern, and contingency along development dynamics.

The purpose of contingency approaches is to provide flexibility to understand and manage the complexity and uncertainty in technology, the marketplace, human relations and cognitive capabilities that shape ISD. However, the promise comes hand-in-hand with challenges. To tackle these challenges and to realise the potential benefits of contingency approaches, further research is urgently needed and can begin with three questions: the question of 'which contingency approach', the question of rigour, and the question of cultures.

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