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### Citation

Bell, Simon and Wood-Harper, Trevor (2014). The innovation of Multiview3 for development professionals. *Electronic Journal of Information Systems in Developing Countries*, 63(3) pp. 1–25.

### URL

<https://oro.open.ac.uk/40109/>

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**THE INNOVATION OF MULTIVIEW3 FOR DEVELOPMENT PROFESSIONALS****Simon Bell**

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[atwh@mbs.ac.uk](mailto:atwh@mbs.ac.uk)**ABSTRACT**

The Multiview Methodology for Information Systems Development has never been a widely used or mass-market approach. It has always had a small user base, a localised approach to a global issue: coherent IS development. This paper concerns the underreported innovation of the Multiview3 methodology for Information systems analysis, design and development – specifically designed for non-specialists working in developing countries. The innovation emerged from the identification of a methodological ‘gap’ in support for non-specialists struggling with Information Systems problem structuring challenges. The Multiview3 story tells us how IS methodology can be innovated to address the needs of users. This version of Multiview is argued to be theoretically distinct from previous versions in terms of its focus (developing countries) and application (problem solving and co-learning in practice).

**Keywords:** Multiview, Action Research, PSM, participatory, methodology, Developing Countries

**1. INTRODUCTION AND BACKGROUND – WHAT IS MULTIVIEW?**

This paper concerns methodology and innovation. The authors are concerned to set out the evolution of a methodology for information systems – a methodology which contains within itself problem structuring capacity. The objective of this paper is to explain how it emerged, why it is important and what it has achieved.

Some clarification is needed on terms. By methodology we mean the science or understanding of method and by innovation we mean to make something new (Webster's 1924). Innovations in Information Systems (IS) Methodology presents as a topic of interest to the information and wider organisation community. Although there was a conspicuous production of methodology in IS in the 1980s and 1990s – in part at least to meet the acceleration of IS relevance and uses, the authorship around IS methodology provides longitudinal evidence to the topicality of the field (for a brief but erudite overview see: Galliers 1990; Baskerville and Wood-Harper 1998; Agerfalk 2010).

Problem Structuring Methods or PSMs are regularly reported upon (e.g. see Mingers & Rosenhead, 2004, Bell, 2012 and the two special issues of the Journal of Operational Research on the topic: Vol 57, No. 7 and Vol. 58, No. 5). PSMs relate to processes for groups and individuals to gain clarity in contexts and with issues which frequently present as being ‘soft’ or ‘wicked’ (Rosenhead 2006; Morton et al., 2007).

We consider that all IS methodology is involved in some level of PSM because IS projects involve subtle mixes of social and technical issues. Further, we argue that all methodology is self-reviewing and necessarily evolves and innovates to meet the needs of changing times and various levels of diffusion (be this rational or knowledge-based (Beynon-Davies and Williams 2003)). One significant methodology of recent times is Soft Systems Methodology (SSM). SSM has had various evolving ‘moments’ involving both progressive movement in the internal organisation and the gradual inclusion of the method in new and various fields (Checkland and Poulter, 2006).

Of necessity IS methodology spans social and technical systems. Therefore, IS has at its core the double challenges of technical/ scientific precision and social relevance in what Emery, described as “turbulent environments”. Such a description could be said to be highly

relevant to the conditions in many developing country contexts. However, the balance between technology and society can be difficult to maintain and recently the value of experiential learning and the importance of understanding IS change as a consequence of wider organisational change have been noted (Pillay et al., 2012). Lee (2010) has reviewed the history of IS with a focus on the four “pillars”: information, theory, system and organization. This four-fold structure will be applied throughout this paper as a heuristic to compare and contrast the various phases of Multiview.

Lee (2010), to some extent supported by Baskerville (2010) suggests that the anxiousness of IS Discipline to ‘science-ify’ the subject has led to an artificial divorce between IS science and art and this might be argued to imply a division between quantitative and qualitative, hard and soft, objective and subjective, theory and practice. In the history of IS methodology innovation this tension is clearly represented. Multiview, and most specifically the third presentation of Multiview (MV3) may be said to have a qualitative and quantitative IS methodological focus and such approaches are missing in much IS work. The very slow trend towards greater use of soft and qualitative methodology is noted in the research literature into methodology application in Management Information Systems (MIS) (Palvia et al. 2003; Palvia 2004) but, describing the use of qualitative methodology Palvia et al. (2003) note

“It was stated in the previous research that many IS researchers who reported results between 1993 and 1997 were not trained in using this methodology and therefore reluctant to use it. It was expected that this methodology would gain acceptance in years to come, but the methodology is still does not find wide acceptance by the IS community.” (Palvia et al. 2003 p. 540).

This may be thought to be surprising given that the value of qualitative methodology has a long history. It may be that the value of qualitative approaches is well understood but the use is less appealing than more quantitative approaches (also noted by Palvia et al., 2003).

The development of the Multiview (MV) methodology relates to Lee’s observation in terms of the frissons between IS science and IS art and, it will be argued, is in constant dynamic to accommodate both – the quantitative and the qualitative.

We will show how MV has innovated quietly alongside the debates in the IS methodology mainstream. MV3 will be argued to be a methodological innovation to fill a gap and meet the needs of those who need a stakeholder orientated and wide-ranging thinking and planning aid to assist them in their problem structuring and in the resulting selection and development of Information Technologies (IT) of all kinds. MV might be said to contain within itself an embedment of Paul’s (2008) observation: “IS = IT in use”.

## **2. THE ACTION RESEARCH ROOTS OF MULTIVIEW**

Multiview has its roots in practical judgement or *phronêsis* (Lee 2010) and Action Research (AR). AR literature emphasises the need for the analysis of social action to be grounded in the context of the action of persons, groups and/or organisations. The morphology of AR is well documented elsewhere (for example see: Kakabadse and Kakabadse 2002) however, Bottrall provided early guidance on the application of AR as a means to achieve transparency and inclusion in development practice (Bottrall 1982). Bottrall’s early work has been extended and discussed in many fields – often related to Information Systems (IS) issues (Stowell et al. 1997; Baskerville and Wood-Harper 1998; Checkland and Holwell 1998; Lousberg and Soler 1998; Paton 2001). More recently, the reach of AR has been tied into issues of self-reflection and vulnerability in IS practice (Bell 1998; Bell et al. 2000) and as a viable means to deal with conflicts and competing stakeholder requirements (Johnsen and Normann 2004).

The demands of Action Research are key to the MV IS methodology innovation because MV is concerned to capture the needs of users. More than this MV3 is intended to be produced by as well as for the eventual users of the information system.

The field of Information Systems Development has been variously described in historical and formative terms (e.g. Avison and Fitzgerald 2003). In support of the need for structure, sequence and coherence, a succession of instructive texts provided guidance to the developers of Information Systems (e.g.: Maciaszek 2001; Dennis and Haley-Wixom 2003).

The context of international development provides an opportunity to reflect on the cross-cultural value of MV in terms of theoretical and use boundaries (Romano et al. 2010). We are interested in understanding the way in which an IS approach developed in North European context has been applied and what implications this has had for enabling non-specialists in developing countries to engage with and own their IS. In diverse cultural contexts it can be argued that the role of any IS approach needs to be particularly sensitive to turbulent environments. The cultural responses to ICT vary globally and across organisations (see for example: Sarker et al. 2010). Action Research might be expected to have potential to bring out the understandings of stakeholders presenting different perspectives in IS contexts.

Question for this paper are:

- Can it be shown that MV3, with its origins in interpretivist approaches like AR, provides a successful means for non-specialists to explore Information and Communication Technology (ICT) realities in diverse cultural contexts?
- Beyond this, does the innovation of Multiview provide any clues to the wider successful prospective of the IS project? The innovation of Multiview may provide some clues.

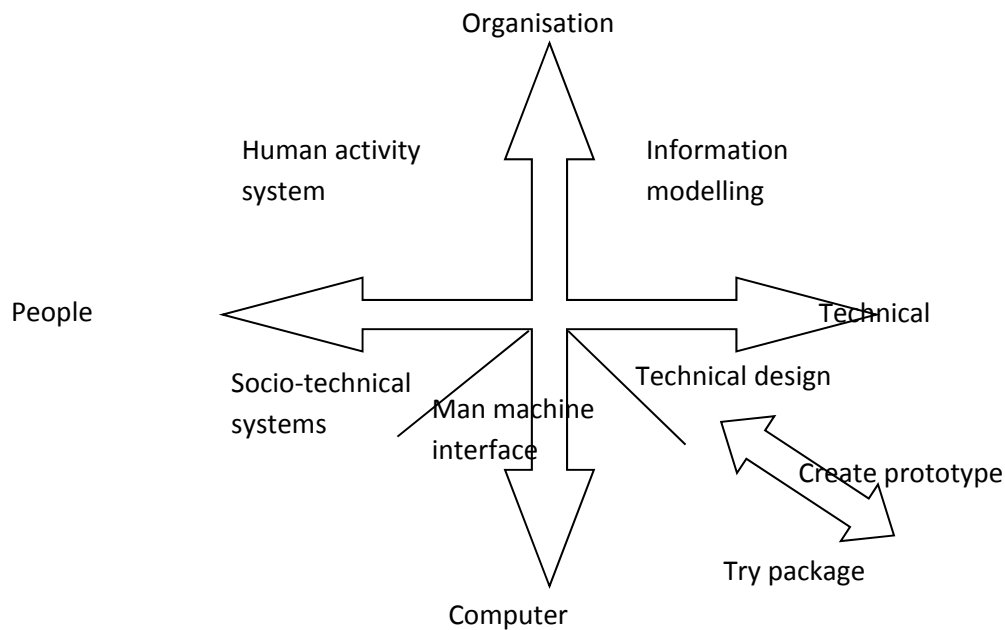
### **3. MULTIVIEW'S INNOVATION OVER TIME**

The development of MV is set out here in terms of three phases supported by major publications. Each one of these phases is demonstrative of a stage in the innovation of the methodology.

#### **3.1 Multiview 1 – MV1**

Avison and Fitzgerald have provided a model of the evolution of MV (Avison and Fitzgerald 2003). Multiview 1 (MV1) was developed for students working in Computer Science and Finance and Accountancy at the University of East Anglia and had its first major presentation in the Antill and Wood-Harper book of 1985 (Antill and Wood-Harper 1985). The final year students carried out action research cases for small businesses using the method in practice. Wood-Harper's initial view was to provide a multi-view of the Information Systems Development (ISD) context, the MV1 version of Multiview introduced provides a sense of the abiding '5' elements of the methodology.

The figure “shows a graph with different viewpoints of the system along the two axes. The vertical axis shows a gradation between the organization on the one hand and the computer on the other. Many users have complained that the computer system takes too much account of the computer and too little of the organization whose needs it is supposed to serve. The horizontal axis goes from the people using the system to the technical (or functional) requirements of the system” (Antill and Wood-Harper 1985 p. 108).

**Figure 1 the five views of systems analysis**

(Antill and Wood-Harper 1985 p. 108)

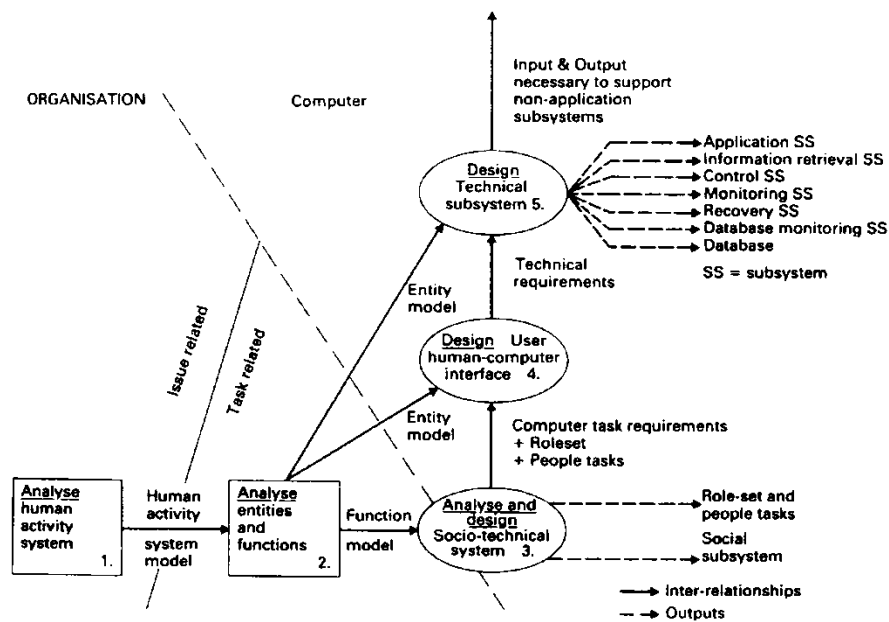
MV1 provided at the time a breakthrough in, as Avison and Fitzgerald put it, not just giving a hotchpotch of techniques but:

“It takes account of the fact that as an information systems project develops, it takes on different perspectives or views: organizational, technical, human-orientated, and so on” (Avison and Fitzgerald 2003 p. 497).

Wood-Harper, Antill and Avison developed the approach (Wood-Harper et al. 1985). In their 1985 book the authors elaborated the sequence of the MV1 approach (see Figure 2).

“The stages of the Multiview methodology and the inter-relationships between them are shown... The boxes refer to the analysis stages and the circles to the design stages. The arrows between them describe the inter-relationships. Some of the outputs of one stage will be used in the following stage. The dotted arrows show other major outputs” (Wood-Harper et al. 1985 p. 17).

Sequence and coherent linkage between elements was important but flexibility of the MV1 was also evolving.



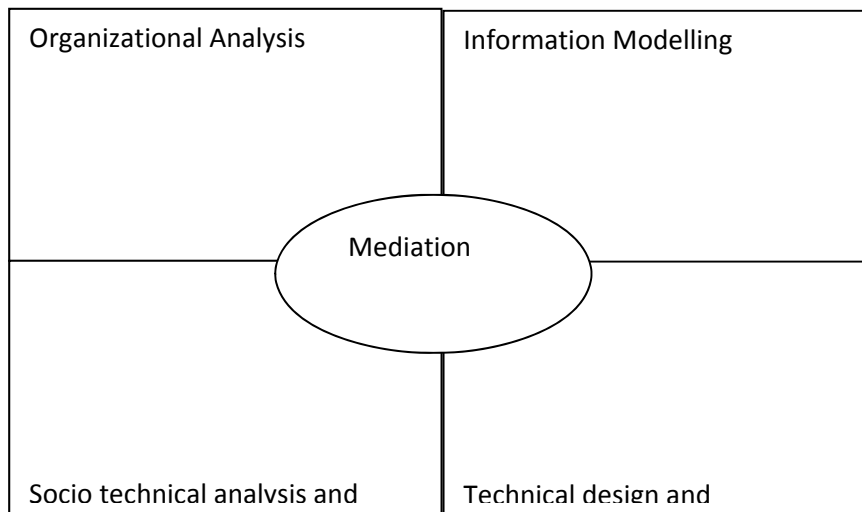
**Figure 2. The Multiview Methodology (Wood-Harper et al. 1985 p. 17)**

“Working from the middle outwards we see a widening of focus and an increase in understanding the problem situation and its related technical and human characteristics and needs.” (Avison and Wood-Harper 1990 p. 24). But although MV1 provided for a range of perspectives it was limited in its flexibility vis-à-vis the role of the analyst. If we consider the features of MV1 in terms of Lee’s four-fold retrospect on information, system, theory and organization certain observations can be made.

In MV1 information and data seem conflated or not significantly segregated in use terms; Systems are nominally intended to mean ‘systems’ but, as Lee puts it, systems concepts references are: ‘only occasional and not plentiful’ (Lee 2010 p. 341); Theory in use does seem to effectively balance between theory for explaining and predicting and theory for design and action; and in terms of organization, MV1 has a focus on what Lee calls: ‘organization as a system’ but maybe references this too closely to an IS perception of organization as opposed to a wider business perception?

### 3.2 Multiview 2 – MV2

The second mode for Multiview was introduced in 1998 (Avison et al. 1998) although it had been suggested earlier (Avison and Wood-Harper 1990). The key issue for the methodology was to be seen in the fluidity of the relationships between the analyst, the situation and the methodology. In this revised version the three foci – organizational analysis, socio-technical analysis and technical design are complemented and drawn together by the emerging information model. All four constituents are mediated by the analyst. The elements of MV2 could also be seen as being more fluid, more systemic in relationship than sequential in stage.

**Figure 3 The Multiview Methodology**

(Avison and Fitzgerald 2003 p. 506)

Mediating a wide range of constituent parts such as stakeholder analysis, object orientated analysis, ETHICS, Ethnographic approaches and Prototyping, this second mode of exploration: “offers a systematic guide to any ISD intervention, together with a reflexive, learning methodological process, which brings together the analyst, the situation and the methodology”. (Avison and Fitzgerald 2003 p. 509).

MV2, as represented in the publications of Avison and Fitzgerald, provided a further basis or pillar to establish the intellectual coherence of the multi-perspective methodology and brought it into relationship with contemporary software tools and techniques applied in Information Systems Development. It is also worth noting that Multiview was achieving more attention in academic journals at this point, but less as a standalone means to develop IS, rather as a significant element of the IS methodology debate, for example Baskerville and Wood-Harper (1998) remains the second most cited paper published by the European Journal of Information Systems.

Reflecting on Lee’s four pillars:

- With MV2 information is more diversely interpreted but clarity to end users in terms of data and information remains an issue.
- MV2 is still a specialist use tool for IS planning and is designed to be most clearly coherent internally to that specialist audience.
- Systems are understood to be still largely in the world but also in the mind of the analyst
- Theory, as with MV1, it is certainly widely engaged in many segments of the IS context
- Organization is increasingly related to the business reason for the IS intervention.

MV2 provided a strong sense of innovation from method to methodology; from recipe approach to reflective IS development, towards a freer and more epistemologically self-knowing form of exploration.

### 3.3 Multiview 3 - MV3

The evidence for methodological innovation and flexibility in developing countries is well established (for a recent example see: Hosman et al. 2008). Primarily, the third mode of

Multiview was innovated from working with professionals and Continuing Professional Development students from developing countries (as opposed to Information Systems practitioners and doctoral students). It was influenced by the needs of developing countries as the potential for IS to make significant impact on all aspects of private and public sector agencies became more apparent. Although IS per se was a relatively new discipline and area of practical concern in international development in the early 1990s, Action Research was a much applied method in developing country contexts (e.g. see: Eyben and Ladbury 1994; Craig and Porter 1997). Chambers work in participatory stakeholder approaches in particular sought to focus attention on non-specialists and to 'Put the Last First' (Chambers 1983) and this has remained as an on-going theme (Chambers 2002). This stakeholder participation ethos, with its implicit focus on inclusion and wider engagement in the analysis and design process finds contemporary equivalence in a number of fields, for example, organizations of all kinds are concerned with inclusion (Cordoba and Midgley 2008) as are those engaged in such diverse concerns as climate change (Kloprogge and van der Sluijs 2006), Forestry (Kangas et al. 2010), policy making (William et al. 2002) as well as in mainstream IS literature (Kreps 2010; Reid et al. 2010) and represented specifically in the development of the Agile IS approach (e.g. Kent et al. 2001, Balijepally et al. 2006, Doerflinger et al. 2013). Much of the innovation in MV3 has been in response to this trend for greater stakeholder inclusion in identifying, structuring and managing IS problems. MV3 also exemplified an early expression of concern for methodology to be positional in terms of practitioner awareness in relation to impacting local processes within macro political-economic contexts (Reilly 2011, Avgerou 2010),

MV3 in theoretical terms has three primary foci, all of which can be seen as being problematic in developing country contexts.

Firstly; to sustain the tradition of the approach as a multiple-perspective methodology. This is of primary importance if the approach is to have value for a variety of stakeholders in diverse cultural and technical contexts but raises the problem of requiring the IS practitioner/learner to have capacity to engage with a wide range and challenging set of analysis, design and development skills.

Secondly, to evolve the methodology as a planning and design approach applicable for the use of non-specialists in IS. This is a significant departure from earlier versions of Multiview. Developing countries differ widely from each other. To some extent the term 'Developing Country' is problematic. What does it signify? How does it affect decision making? These and other questions require caution in the extrapolation of ideas which represent developing countries as a whole. The IS tools requirements in developing countries (in a general sense) are argued to be significantly different from those of more industrialised economies (Madon 2005). For example, often a discreet cadre of IS professionals or proto-professionals does not exist and, IS methodologies need to be more accessible for non-specialists who have IS responsibilities (Davison and Chiasson 2005). MV3 is a methodology purpose-intended for this context and we argue that the use and value of MV3 remains obscure because its core user group – non-specialist practitioners in developing countries – is near invisible in the literature (Gill and Bhattacharjee 2009 p. 219). This is far from being a new issue in development studies (Posnett 1980) but, it in turn means that the outcomes and impacts of MV3 also remain largely un-known to those who could learn most from them.

Thirdly, as a means to improve reflectivity in practice, MV3 was engineered to provide those engaged in analysis and design with an explicit means to record and reflect the perspective of the analyst/ analyst group from within the IS enquiry. However, this requirement adds the task and therefore potential problem of requiring the MV3 analyst to engage in active reflection on practice.



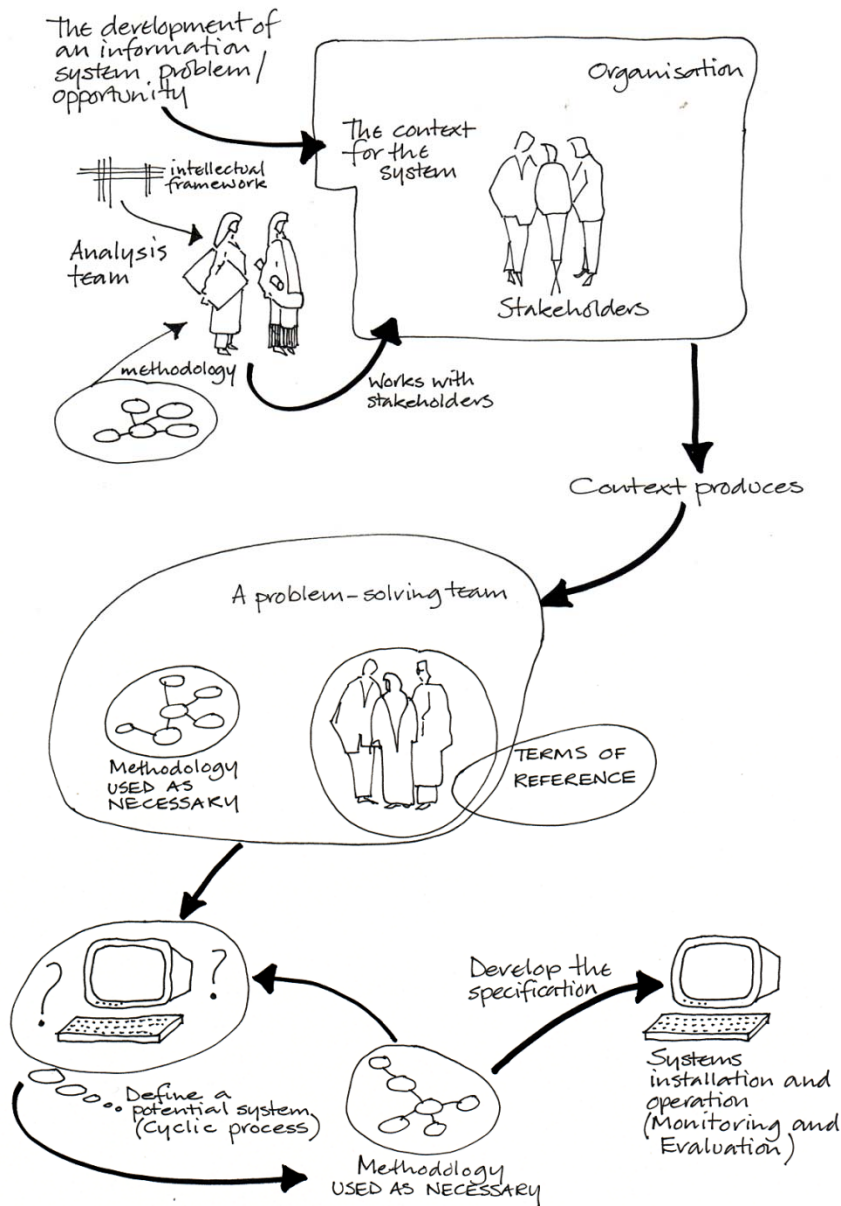
These three foci can be argued to contribute sequentially to the wider historic legacy of Multiview:

- As a means to review and structure a problem context from a range of perspectives (evident in the 1985 origins of the methodology)
- As a requirement of the ‘made simple’ origins of MV1 (Antill and Wood-Harper 1985) and to the reflective practitioner aspect of MV2.

MV3 is shown in outline in Figure 4.

MV3 is systematic and therefore comparable to MV1. However, this systematic format is supported by a focus on reflective concerns as set out in MV2. Figure 4 indicates the importance of stakeholder engagement and the flexibility of the use of methodology dependent upon the prior requirements specified by the stakeholders engaged in the IS project. Systematic application and self-reflection by the analyst on application was set out most clearly in Bell (1996). In this work the analyst’s self-reflection was formalised into a distinct pre-analysis phase. One example of this pre-analysis is shown in Table 1.

Figure 4. MV3 (Bell and Wood-Harper 2003 p. 158)



**Table 1 A simple self-analysis tool**

1.	2. The intellectual framework	3. The methodology in use	4. The area of application	5. The analyst
Frame 1	Development-studies literature based on the planning tradition (making things happen). Some geographic information-systems literature.	DataPro (a software selection tool adapted to system planning).	East Africa. Many imponderables. Critical issues of data requirements of the system.	Technical constraint on the individual, functionalist, consensus regulation.
Frame 2	Focus on harder systems approaches due to the need for quantitative details of incoming systems.	Adapted DataPro. Adaptations focusing on rigour in specifying the requirements (in data terms) of systems.	West Africa. Again data blind spots but linked to hidden agendas on the part of donors and recipients.	Mechanical efficiency, conservative, consensus regulation.
Frame 3	Critical of the hard tradition. Recognition of the Lindblom view 'muddling along'. Some interest in softer methodology.	Second amended and adapted DataPro. This time with more emphasis on political and social considerations.	West Africa. Very disorganised views of systems by both donor and recipient. Methodology again too inflexible.	Social forces, interpretative, consensus regulation.

(Adapted from Bell 1996 p. 77)

As an aside on the matter of the personality of the primary analyst, It can be argued that MV3 shares some of the characteristics of methods currently widely used in IS such as Agile (Kent et al. 2001). The focus on individual interactions, collaboration with customers and responsiveness to change (Barlow et al. 2011) are common – as is the interest in the character of the analyst and how this affects the resulting design (Balijepally and Mahapatra 2006).

Learning and self-analysis (as shown in Table 1) provides the MV3 analyst and analysis with the capability to consciously review methodology in use, intellectual focus and area of application. This kind of three way review is evident in Soft Systems literature and implicit in prior versions of Multiview, but it was in MV3 that the exercise became a pre-requirement of the analysis.

As noted at the outset of this paper, IS are social and technical constructs. With the inclusion of explicit means to self-assess the motivations of the analyst, MV3 developed a third psychological aspect to the IS planning mix and, building on this, MV3 involves a

reflective use of methodology, and an internalised approach where elements of the approach can be applied in or out of sequence (as noted in Figure 4). Initial problem structuring is dependent on stakeholder and context and so, to some extent, MV3 migrates from an approach focused on IS to a wider problem structuring approach concerned with all aspects of the context under review. As Rosenhead and Mingers argue in their seminal text: “problem structuring methods provide a repertoire of methods for making progress with ill-structured problem situations” (Rosenhead and Mingers 2001 p. 9). “ill-structured problem situations” sums up the usual context for the application of MV3 very well indeed. If the guiding spirit of MV2 is a learning reflective process, then the spirit of MV3 is self-reflection and mutual learning in action in variable cultural and organisational contexts. However, equally important for MV3 is the focus on non-specialist phronêsis in IS – this is where MV3 finds a significant gap in the existing methodological provision.

The need for local empowerment and buy-in to development process has been put by Bessant:

“The fact that operations carried out in 'black boxes' are invisible and require specialist support and maintenance means that there will be minimal technology transfer or opportunity for 'unbinding' – breaking the package down into elements more suitable for assimilation in developing countries. Perhaps most significantly, control is retained by the supplier, and the opportunities for imitation by developing countries are reduced”. (Bessant 1987 p. 166).

Consistent with this argument, MV3 was specifically developed for assimilation and application by non-specialists (Bell and Wood-Harper 2003). It includes stages outside those which would normally be ascribed to analysis and design such as procurement, project planning tools (Dale 2003) and monitoring and evaluation of final systems implementation. A further innovation in MV3 was the development of a simplification of the information modelling stage. Information Modelling is arguably the most technically demanding element of MV. Given the requirement of MV3 to be accessible to non-specialists it includes a user-driven version of Information Modelling called End User Information Modelling. This provides a means for organisation stakeholders to assess their existing information and data needs and to model new scenarios.

### **3.4 A Multiview 3 Case Study in Brief**

A brief worked example will help to demonstrate the way MV3 was experienced. The case in point was developed in China and was related to the development of a Financial Appraisal System. We will not go into the detail of the system itself but the manner in which MV3 was applied provides insights into its practicalities.

On the identification of the project objective a meeting was held with Chinese stakeholders in the host organisation and the overall MV approach was described. At this time the social and technical requirements for the team were identified (e.g. likely and necessary inclusion of skills in programming, system building, database design as well as financial and accounting abilities) and a team of seven practitioners was assembled and a team leader was put in place. It needs to be noted that the assembled team did not meet all the technical requirements – such skills were not readily available - but it was believed that they did possess the necessary curiosity and confidence to be able to explore the project brief and gain and/ or find the skills necessary to deliver the project goal. The project was in part funded by an international agency and therefore the team set up was to some extent a compromise between local selection and international requirement. The final team satisfied both sets of requirements.

Following the initial set up the team gathered to engage in the preliminary Soft Systems analysis of the context. During this phase they explored the project brief, their own capacities and the needs of the clients. The project was complex and would, of necessity, be

developed in a modular manner – allowing small sections to be developed rapidly, tested in context and then extended and linked to new sections.

The project would be testing to the team both in terms of the financial information being organised, the computational and technical elements and the organisational requirements to fit the system to the final users.

Part of the output from the first, soft phase of MV3 was to provide an assessment of what could be achieved rapidly. Following this, the Team, led by the Team leader and assisted by one of the authors completed a run through of the MV3 approach. During this process, which took several weeks:

The phases of MV3 were undertaken in a systemic manner – e.g. the Soft Systems overview focused on initial project deliverables, these were mapped out in terms of an agreed defined systems model supported by an information model (mainly relating to financial and commodity data) which would produce a series of indicators and other information products. The information model was then assessed in terms of its social and technical requirements (what level of people and technical skills would be needed to deliver it and what were the major deadlines to be met); this in turn was roughly reproduced as a series of interface suggestions which could be the front end for a management information system and, finally, the suggested systems was planned in terms of hardware, software, training needs and an implementation strategy.

The team then needed to work out what skills they needed to learn. These ranged from computer skills (mainly learning software packages), financial skills (learning how to implement certain kinds of financial analysis within networked computer contexts), operational skills (implementation, risk analysis, project management) and people skills (recruitment, personal assessment and organisational analysis).

Following this a training programme for the team was initiated. The training was undertaken whenever possible within the context of the project but some international training also took place. At these times elements of the final system were used as the basis for training.

This was all part of setting up the Team. The Team made a decision to undertake a full MV3 analysis, including a skills analysis of themselves, prior to beginning the actual project work. They also decided that they would undertake all additional training within the context of the project... all training would be practical and project based rather than being academic or unrelated.

A few changes were made early on in the use of the methodology. In an early meeting it was noted that the team did not have a uniform understanding of the task that they were addressing. To help with this they included an assessment of the Strengths, Weaknesses, Opportunities and Threats or SWOT of the context. This helped them to share their assessment of context and gain an consensus on what was most likely/ least likely to work. The Team also decided to apply Soft Systems Analysis in a less structured manner, allowing phases to occur in and out of sequence and on demand as the task developed. This allowed more flexibility in response to changing circumstances. This was very much an all-Team process with responsibility for the analysis being shared.

Finally, the project took place over a two year period and this included on the job training both in China in other locations. Various team members were encouraged to gain new skill sets and to explore roles with which they were not familiar. During this process the MV3 approach itself was considered and critically assessed and this in turn led to changes in its sequence, application and evaluation.

Within the two year period a prototype system was produced and explored in country. All seven Team members gained training in specific skills as well as in the overall MV3 process.

### 3.5 More Examples of Multiview 3

A brief selection of additional MV3 projects produced by professional working on CPD at the University of East Anglia are provided in Table 2

In 1985 the Overseas Development Group at the University of East Anglia (UEA) began teaching Multiview to non-IT Professionals. The short course aimed at non-IT Professionals, with requirements to build ICT applications within their organisation. Applying MV3, dozens of non-ICT practitioners have provided un-published plans for IS in a large number of developing country contexts. The table provides an overview of a sample of MV3 projects undertaken by professionals attending Short Course and Master Class events at the University of East Anglia. A number of points emerge from considering this set.

- They represent work undertaken in MV3 between 1999 and 2011
- The reports indicate that the methodology can be applied in degrees, involving intensity and completeness
- The majority involve the main five stages of MV3
- Innovation in the methodology relates to a three primary forms:
  - o The addition of technical stages
  - o The addition of conceptual
  - o Methodological recast
- The use of MV3 is evidenced as being applicable in a global set of scenarios.

An example of each innovation type demonstrates the stakeholder engagement in active methodology evolution.

Table 2. Example projects with MV3 from UEA

Country	Year	Nature of project for MV3 treatment	Use of all five stages? <sup>1</sup>	Nature of innovation on the MV3 method	Type of innovation
Bangladesh	2004	Impact monitoring and MIS	SSM and IM only but in great depth	Direct policy of social inclusion in the early stages Logical Frameworks for project planning in final stage	Additional conceptual element Additional technical stage
China	1999	Financial Appraisal Information Systems	All five stages in great depth	SWOT analysis alongside SSM mode 1. SSM in mode 2 at times Refreshing and reworking – the adoption of a Learning Cycle to the use of MV3 Sequence not applied in order – a freer use of MV in line with SSM2.	Additional technical stage Methodological recast
Ethiopia	2000	Health Management Information System	All five stages in great depth	Development of a stakeholder matrix to help with the SSM Risk analysis in IM stage Logical Framework for project planning in final stage	Additional technical stages
Ghana	2003	Proposed computerised MIS for HIV/AIDS National Response in Ghana	All five stages	Specification of a ‘priorities activities model’ following technical details	Additional conceptual element

<sup>1</sup>MV3 has five formal stages: Soft Systems, information modeling, socio technical systems design, human computer interaction/ interface design and design of the technical details.

Jamaica	2005	MIS for Jamaica	All five stages in great depth	Elaboration around the socio technical systems stage. Individual weighting of a wide range of social and technical factors with the development of an algorithm to sort out the best combination.	Methodological recast
Nigeria	2011	MIS for the Administration	Focus on first stages	More of an organisation capacity analysis than a systems analysis Detailed analysis of tasks and issues into Systems of Challenge (innovation from SSM type approach to Imagine type approach). Transfer of IM to Access	Additional conceptual element Additional technical stages
Pakistan	2006	MIS for Monitoring and Evaluation	All five stages in great depth	Detailed analysis of tasks and issues into Systems of Challenge (innovation from SSM type approach to Imagine type approach). Transfer of IM to Access	Additional technical stages
Sierra Leone	2011	Programme Monitoring for Decentralised Service Delivery Programme	All five stages	Transfer of IM to Access Development of a range of indicators from the MIS – performance, impact, sustainability and strategic	Additional technical stages
Zimbabwe	2002	Improve the management information systems for the school without walls.	All five stages in great depth	SWOT analysis in SSM Development of project Logical Framework	Additional technical stages



### **The addition of technical stages**

In a number of examples stakeholder groups have included phases to MV3 – these are generally included in order to provide sequence and schedule to a proposed IS intervention or for the testing of the IS output in a formal organisational context. Also important are innovations in the presenting technical stages of MV3. For example, in cases in China and Pakistan the form of Soft Systems Methodology was adapted. The most common but trivial innovation noted in this technical category is the migration of a worked information model into potential software.

### **The addition of conceptual stages**

The conceptual innovation of MV3 is shown most particularly in an example drawn from Nigeria. In this case MV3 is less useful as a formal means to develop information systems and is more specifically applied as a means to explore and structure the current processes of an organisation. In this sense MV3 is less about a technical analysis of information flows and more concerned with understanding the deeper organisational nuances and requirements (primary attributes of a PSM).

### **Evidence for this is shown in such features as:**

A concern with all major processes in the organisation

Movement from analysis focus to design focus on structural change rather than informational change

Concern with human relationships over and above those necessary for information purposes.

### **Methodological recast**

A good example of this rarer form of innovation is taken from a report produced for Jamaica. In this example the stakeholder needed a high degree of clarity regarding the social and technical costs and benefits of various means to realise the final information system. In the conventional form of MV3 the various alternative combinations of social and technical assets (e.g. training, other forms of educational development, departmental incentives, hardware, software, infrastructure support, etc.) are combined and then compared for costs and benefits. In this case each of the various assets were individually assessed for cost and benefit, allocated a distinct value and then combined. Although this innovation may sound trivial it provides a much more precise sense of the disaggregated costs of a specific combination of human and technical elements for a suggested IS and this in turn is easier to model into a financial plan.

A number of observations emerge from the various cases and forms of innovation.

Firstly, MV3 is being applied in all almost all cases by professionals but not Information Systems or Information Technology professionals. The level and regularity of successful conclusion of MV3 applications provides evidence that the methodology is open to stakeholder involvement and not the preserve of a technical specialist class.

Secondly, a high degree of the applications of MV3 are argued to be ‘innovative’ in that the user of the methodology, irrespective of their level of existing expertise, has felt able and capable to make addition and /or change to the approach in the light of practice. Much of the innovation noted in MV3 relates to the nuancing of the methodology to the specific problem structuring (noted in part 1 of this paper) dictated by the location. We argue that this implies that the methodology can be

transferred in such a manner as to provide the user with the confidence to make adaptation to the specific context in which they are acting.

Thirdly the methodology is readily transferrable to a diversity of cultural and ethnic groupings. Also, although innovation is relatively common in the examples chosen, the core of the five stage methodology remains intact and coherent.

To return to Lee's four pillars of retrospection:

In MV3 information is defined by the non-specialist within his or her context. The nature of information is therefore implicitly linked to stakeholder defined context specifics.

System are primarily seen as being in the mind of those engaged in the context. This 'soft' view is noted by Lee as being particularly valuable (Lee 2010 p. 345). MV3 is action and context orientated .. in this sense the place of theory is less overt in use terms.

The *raison d'être* of MV3 is to provide structure and relevance to problem context. In this sense organization is now defined by those engaged in context and can extend beyond the ICT and the business to the wider organization concerns.

#### **4. DISCUSSION: MV1 – MV3**

To return to the two questions set at the outset:

Can it be shown that MV3, with its origins in interpretivist approaches like AR, provides a successful means for non-specialists to explore Information and Communication Technology (ICT) realities in diverse cultural contexts?

Beyond this, does the innovation of Multiview provide any clues to the wider successful prospective of the IS project?

The answers to both questions is at present non-conclusive but we believe important points are evident.

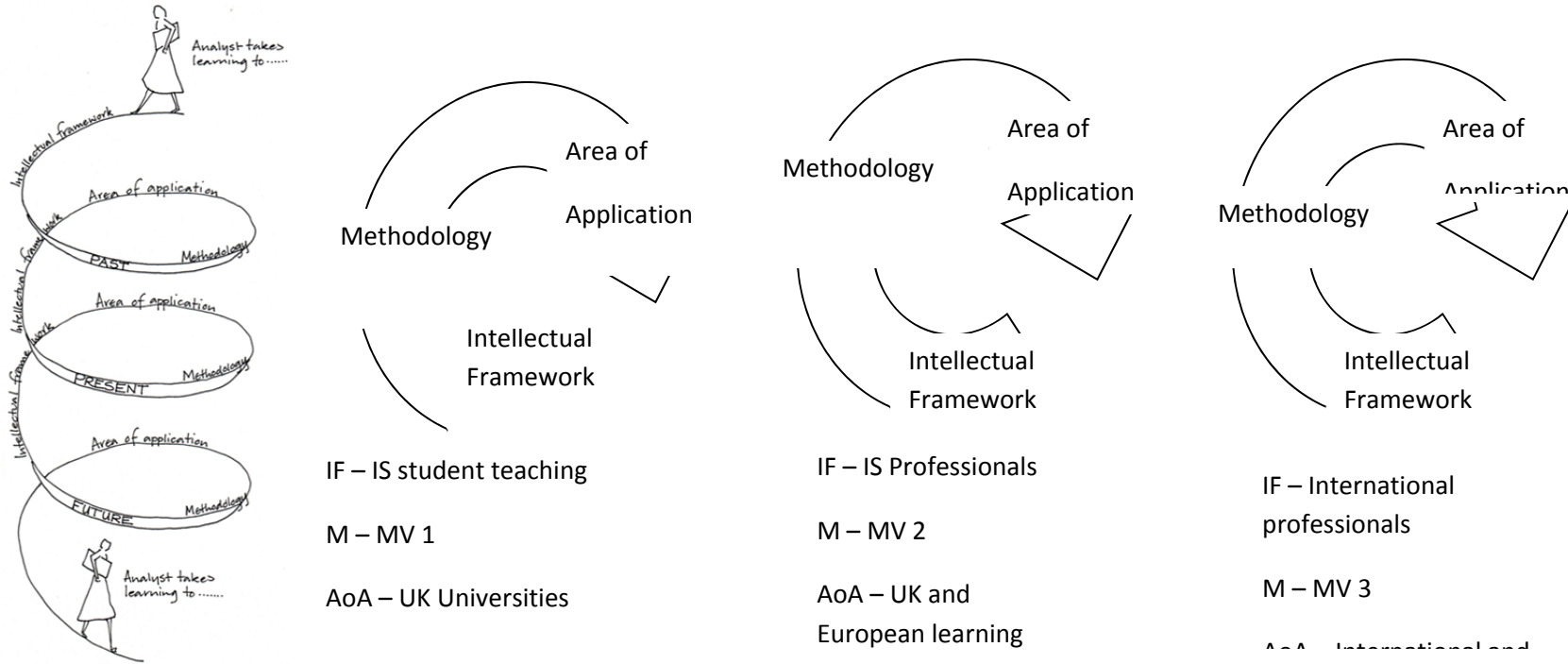
We have explored the origins, modes and innovation (both by academics and by stakeholder participants) of Multiview. The authors argue that, building on Avison and Wood-Harper's observation, Multiview has three distinct and separate modes of application which have built on each other. MV1 was primarily concerned with the application of interpretivist and action research orientated approaches to information systems applications largely in academic teaching settings. MV2 focuses its attention on the systemic development of the analyst within a learning IS context applying itself to more recent developments in software applications. MV3 has emerged from the perceived need for non-specialist analysis and design tools as well as self-reflection for the analyst operating within a variety of cultural contexts or 'turbulent environments'. MV3 is also assumed to operate within contexts where potentially self-contradictory needs for rapid, user-friendly yet precise approaches to IS are applied in developing countries by non-specialists.

Multiview is not a mass-use approach but, in its various modes it has been applied and or used as a guiding theme in a wide range of contexts recorded in the literature from Land Administration system (Silva 2006) to web systems (Vidgen 2002; Vidgen et al. 2002); from cultural analysis (Zhu 2000) to micro finance systems design in Bangladesh (Bell and Wood-Harper 2006; Bell and Wood-Harper 2007). In the UEA context it has been applied by professionals but non-specialists in IS terms even more diversely in countries as different as New Zealand and Afghanistan; in contexts as diverse as the development of systems to handle post rape services, monitoring HIV Aids and Avian Influenza. Within its specification Multiview is expected to provide the analyst or analysis/ stakeholder team with the means to capture, structure and explore wide visions of IS contexts in a manner which is open

to stakeholder direction and open to change. From MV1 to MV3 there would appear to be a consistent requirement to gain clarity from the context (often referred to in Soft Systems terms as a problem situation) and to meld and model in a coherent but sensitive way an IS solution (if this is seen to be necessary on reflection). Other approaches claim to do similar things. Strategic Options Development and Analysis (SODA) recognises the value of the analyst's (consultant's) personal journey in the understanding process (Morton et al., 2007). Capability Maturity Model (CMM) focuses heavily on structure and staged processes of development (Batten 2008). Euromethod is intended to cover the whole scope of analysis and design and, like MV3, includes procurement and monitoring and evaluation (Turner and Jenkins, 1996). Requirements Analysis, whilst having a focus on technology, incorporates organisational requirements closely linked to technical capabilities (Maciaszek, 2001). In this sense Multiview might be argued to be one of many IS approaches which take problem structuring and socio-technical systems as being central to the project.

The conceptual development of Multiview in modes 1 – 3 are shown in Figure 5. In a stylised form the Figure demonstrates the evolution of Multiview, altering in terms of context or Area of Application – primarily to meet the practical judgement needs of the users of the approach; from Computer Science students in the UK, to UK and European Professionals in the IS business to the wider international professional and IS stakeholder community. Adaptation of methodology follows from the learning of the author and the context of the application. Therefore, the authors would argue that the changes in Multiview have been less to do with marking trends in the sophistication of the ICT market (although this is noted most specifically in the technical focus of MV2), but rather in the emerging importance of micro-level development of IS, i.e. what we might call “the rise of the stakeholder”. In MV3 this is linked to the increasing importance for a reflective process for the analyst leading in the IS process. MV3 arose from an understanding of the needs of non-ICT specialists in developing countries to apply tools which help them to structure and plan their IS needs – in this sense it could be said to offer an emancipatory aspect to IS planning (along the lines of: Fals Borda 1996; Moggridge and Reason 1996; Callo and Packham 1997). However, MV3 has a potential resonance with diverse groups.

Figure 5. Stripped down Conceptual Development of Multiview – modes 1 – 3.



Building form Bell and Wood-Harper 2003 (Bell and Wood-Harper 2003 p. 36)

With the continued outreach of the products and innovations of Information Systems to a wider range of stakeholders in organisations and the general public in civil society globally (for example the application of Twitter, Facebook and YouTube), MV3 can be argued to have potential for the non-IS specialist and provide this user group with thinking and practice tools to model and plan their expanding IS development, implementation and use. We would draw a distinction here between MV3 as a methodology and as a theory. In a sense the power of the third incarnation of Multiview is more in terms of the precepts of the theory more than the details of the methodology. The empowering of non-specialists in the process of IS development is the key precept of the theory.

To some extent, this opens up IS methods to engage in contexts not merely in narrow definition 'information' focus but also, as already noted, in the wider spectrum of Problem Structuring Methods (see, for example: Rosenhead and Mingers 2001; Bell and Morse 2007) and in change management (Pillay et al. 2012). In this mode IS development may be better placed to manage the range and magnitude of issues which beset contemporary IS.

To better answer the questions set out at the beginning of this section, areas which would be enriched by further analysis include:

- A review of the value of MV3 in context. This could be achieved by means of on-line interviews with past CPD students from the UEA module.
- Analysis of the sustainability of these MV3 interventions and
- An exploration of any sense of diffusion following initial use.

## 5. CONCLUSION

In conclusion, the authors would like to draw on the findings of this study to emphasise what we feel are the major themes addressed by the Multiview project – as a theory and a methodology.

The focus on developing countries. MV3 is deeply concerned with the ways in which human beings, specifically those living and working in developing countries interact with IS. The lack of focus on this important and more holistic feature of human interaction is noted by Zhang et al. (2005) who also note that human interaction is:

“considered far too little (only the screen interface) and far too late in the IS development process (only at the design stage). Thus, often a gap exists between satisfying organizational needs and supporting and enriching human users” (Zhang et al. 2005 p. 512).

The design properties of an IS methodology are important but, as noted by (Siau and Tan 2005).

“The findings of this study show that methodology use and deliverables are also relevant, if not as important, in evaluating ISD methodologies.” (Siau and Tan 2005 p. 870).

MV3 is an approach primarily designed to enable and facilitate non-specialist use. Paul Feyerabend, suggested that when it comes to developing methods:

“It is clear, then, that the idea of a fixed method, or a fixed theory of rationality, rest on too naïve a view of man and his social surrounding ... there is only one principle that can be defended under all circumstances and in all stages of human development. It is the principle: anything goes” (Feyerabend 1988 p. 19 (authors italics)).

Whilst MV3 is not an exemplar of ‘anything goes’ it does relate to the need to innovate methodology into the gaps where existing methodology does not reach, in this case primarily the non-specialist structuring IS issues in developing countries.

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