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Systematic Literature Review of Soft System Method Use in Information Systems Field

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Systematic Literature Review of Soft System Method Use in Information Systems Field

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ABSTRACT

Currently it is crucial for researchers to use soft system methodology in their study for social related issues in order to have operational, bureaucratic and attitudinal changes. SSM creates a set of achievable & socially suitable activities which can be engaged to recover the problematic condition. SSM can answer management (administrative) or business difficulties in IS task for diverse sights like technology, community, socio-technical and processes. Therefore, Soft System Methodology offers a tool to examine a wicked problematic condition.

This paper has reviewed the different existing literatures using systematic literature review technique by exploring how SSM is being used in IS field and identifies productive areas of activities. Then after identifying its use in IS field, and screens out the areas, additional study is required by mixing with other methods or techniques to be more efficient and should be applied in innovative companies for product improvement.

Keywords: IS field, SSM, SSM use, Systematic literature review.

INTRODUCTION

In today's research world different papers are published every time and everywhere. The same is true for information systems (IS) field worldwide by using different methods for different problems. As we all know information system is an interdisciplinary field and studies information related to or contains with technology, human and organizational issues. Most of the time these three features are emphasizes on ill organized problems which is not goes with hard ones. Therefore, these problems can be handled by using a proper way of tool using soft system methodology (SSM) which is a good fit for confused or messy problems. This study focuses on SSM use in the IS field.

Soft system methodology was developed by Checkland in 1981 at Lancaster University in UK, and focuses on the tricky condition which is hard to describe by raising the query of what the system ought to do. Soft systems methodology is an advanced, well-examined discourse technique that has been practiced in several means in numerous situations and the weight is concentrated on discussion (Midgley, 2003).

The advancement of managerial structures or systems is branded through taking together hard and soft aspects in that institution. The "hard" features naturally covenant through hardware and software schemes, however the "soft" features naturally covenant through managerial, administrative, and ethnical schemes i.e. human issues. Although abundant issues has existed by writing on how to fix the "hard" feature of scheming managerial systems, the "soft" or social feature has gained relatively fewer recognition. Largely the absence of achievement of various administrative systems has further to do with the letdown to contemplate non-technical aspects in planning and improvement (Presley et al., 1998).

Soft System Methodology aids to construct a multifaceted structural and governmental conditions and appears to answer whose can be greater than just practical (Weeks, 2015) and as well as mostly valuable once a necessity happens to cultivate convincing work proposal to meet difficult or societal conditions in which individuals are getting complicated, or grasp divergent sights, the condition and roots of the problem circumstances, how it can be met and what objectives are to be operated about. The collected process assists publics to realize a common ruling that can be the foundation for deeds to solve the problem conditions.

Soft System Methodology uses extensive interviews to recognize the problem condition. This can be denoted by using "rich picture" and then by making a "root definition" by 'CATWOE' (Customers, Actors, Transformation process, World view, Owner, Environmental constraint) principle or standard. These are a base to create a "conceptual model". This leads to a need of "feasible and desirable change" and then "applying actions" on the ground.

An essential concern for this technique is increasing members' mentality of several global outlooks and categorizing on how to contain them. Another significant issue is the technique's side in constructing approved proposed work and executing them, instead of closing the progress with a set of combined decisions. This "soft" i.e. purpose discovering method is good for big organizational matters or complicated problems (Wang et al., 2015).

Soft System Methodology creates a set of possible and ethnically suitable activities which can be brought to advance the problem condition (Checkland and Scholes, 1999). These activities might be helped to give a lot of IS necessities, however it is largely uses to understand them as a bunch of managerial process enhancements, where a process is a group of managerial works done decisively through individual's performer(s).

Soft systems methodology is a less organized discourse technique than several else. It emphasizes on activities inside a systems viewpoint and the determined activities examined a system by itself communicating with additional systems.

A numbers of studies are a focus of study and this paper covered 20 publications selected by following the scientific literature review techniques. This systematic literature review is about to identify Soft System Methodology use in the IS field. Therefore the research question was:

- What are the soft system methodology uses in information systems field?

The outline of this paper review covered the introduction of Soft System Method, the description on how the systematic review was performed, the body of knowledge (discussions) and finally the conclusion.

SEARCH PROCESS

In using systematic literature review the search process taken a great influence on gathering the top and qualified papers in this arena (Brocke et al., 2009). A set of processes and strategies must be kept to guarantee the merits of the retrieved literatures to accomplish trustworthiness and validity. The validity implemented when examining the publications by gathering the desired resources from databases and journals. Much of the publications are from the international Information System journals but also from specific Soft System Methodology related journals and conference papers.

These are some of the lists from where the literatures were composed of:

Academic Databases

Research Gate

Science Direct

International Journals

MIS Quarterly

Association for Information System (AIS)

International journal of e-education, e-business, e-management and e-learning

International journal of combinatorial optimization problems and informatics

International journal of education and development using ICT

International journal of computer science issues

International journal of advanced computer science and applications

Some Special journals

E-learning and digital media

Computers and electronics in agriculture

Information and computer security

Conference proceedings

European conference in information system

SELECTION OF THE LITERATURES AND INCLUSION CRITERIA

The first search process brought 309 potential literatures. In the following stage, those literatures' were screened and selected by aiming on the identified international journals, known conference papers and specific journals. The titles, abstracts, conclusions were scanned if required sometimes the entire write up was also seen and the literatures within 20 years period incorporated and for the searching process the following keywords (inclusion words) were used.

No	Phrase
1	(soft system method OR soft system method use) AND (information OR information system OR organization)

Table1. Searching keywords for Soft System Methodology use in IS research

By evaluating the contents of the publications 32 papers were remaining then further reduced to 20 papers by eliminating the integrated ones i.e. Soft System Method with other methods, techniques or approaches. So, action research, grounded theory and Unified Modeling Language methods combined with SSM are

excluded from the selection. So, at last a pure SSM studies are remaining. And also much of the papers were found from the known international databases (3 Articles), journals (14 Articles) and conferences (3 Articles) were filtered.

THE VARIOUS SOFT SYSTEM METHOD USES IN IS DISCIPLINE

Various literatures were gathered which utilizes SSM in IS field and can be separated into 3 primary portions: first investigating the present conditions or state, then constructing frameworks and finally applying activities (Checkland, 1981). The necessity of utilizing Soft System Methodology is enabling the whole stakeholders to be included and to determine the present and the needed frameworks. It must be noticed that a framework might be specialized and financially plausible from a hard framework viewpoint yet at the same time also dismissed by different reasons. The soft issues are frequently identified with identity acknowledgment and societal attainability. In this manner, issues, for example, morals, genuineness and positive attitude might affect inspiration or novelty arrangement (Wilson, 1990).

Using Soft System Method, it is logical and ready to alter by addressing the requirements of the problem circumstances and it has a diverse utilization for various types of organizations (Hillier and Vogel, 2003). As indicated by the Sorensen et al. (2010) the coordination of organizational IS expected to educate administrators' with respect to proper guidelines, suggested rules and certification desires for different basic leadership forms for Farm Management Information System (FMIS) as an essential for a devoted modeling of data. Here SSM uses to demonstrate FMIS for arranging and managing of crop production. Along these lines, SSM directed the developmental procedure of dissecting the data streams, characterizing the records, information insertion and necessitates for electronic management.

SSM is a viable methodology for supporting different sets of institutions meet up to recognize necessities for institutions frameworks (Presley et al., 1998). By including clients into the advanced procedures, incorporated the enhancement of a strategy and assisting arranged apparatuses for the vital clearance of opportunities in organizational business innovation; an advising technique for actualizing ceaseless enhancement in little enterprises; a key IS to help authoritative basic leadership and an approach for business execution administration.

The Hillier and Vogel (2003) built up a soft frameworks process for the examination and meaning of frameworks issues in Small and Medium Enterprises (SMEs). The aim behind this procedure is to act as a leader for frameworks experts in their work with SMEs. The motivation was to give a procedure that thinks about the specialized, hierarchical, individual and shared measurements of a frameworks improvement

issue. They attract a proof from the soft frameworks, different points of view and frameworks improvement writing to clarify the premise of the aimed procedure.

The Electronic Data Interchange (EDI) is a multifaceted and in between enterprise improvement (Kamsah and Wood-Harper, 1999). The specialized, political, financial matters, in between enterprises should be at the same time given genuine contemplations to guarantee the reception and combination of EDI into a current IS framework will really profit the embracing enterprise. Here Soft System Methodology gives hopeful highlights which are proper for EDI advancement on the ground that Soft System Methodology has adaptable, unforeseen and taking action methodology as usual.

Soft system methodology must give significant advantages in overseeing desires and prerequisites for a product or application centric system (Niu et al., 2011). A case study was utilized to investigate the job of SSM in accepting the activities of requirement engineering and studied a social and practical application established by a group of studying institutions. It is discovered that SSM has a wider view and surely distinguish a generally entire arrangement of requirement engineering defects.

In other investigation a conceptual model was created in order to assess the utilization of Soft Systems Methodology for the enhancement of educating personal computer to expertise them in ladies' schools (Al-Jarallah, 2018). The accomplishment of Soft System Methodology use was exhibited in the “rich picture” which appeared to be useful particularly in showing the contention on both the learners’ and the instructors’ requests by protecting the impediments of the situation for improved comprehension of the circumstance.

This investigation tried to discover the present troubles and impediments confronting the innovated teaching-learning of ICT from the instructors and learners points of view in utilizing Soft System Methodology as a PC instructing apparatus to encourage the assessment and enhancement.

Author(s) of the study	Study title	Specifically SSM used for
(Yadin 2013)	Soft Systems Methodology in an Educational Context-Enhancing Students Perception and Understanding	-Educational purpose -Student centric learning
(Al-Jarallah 2018)	Application of Soft Systems Methodology for Computer Module Evaluation for Teaching Computer Technology in Girl’s Secondary Schools in Al Qassim Saudi Arabia	-Computer module evaluation -Teaching computer technology
	Defining innovation: Using soft systems methodology to	-Innovation of technology in

(Cox 2010)	approach the complexity of innovation in educational technology	Education
(Sensuse and Ramadhan 2012)	Enriching Soft Systems Methodology (SSM) With Hermeneutic in e-Government Systems Development Process	-E-government systems
(Sensuse and Ramadhan 2012)	The Relationships of Soft Systems Methodology (SSM), Business Process Modeling and e-Government	-E-government -Business process modeling
(Nair 2014)	Soft systems methodology for personalized learning environment	-Personalized learning
(Diaz-Parra et al. 2014)	Soft Systems Methodology for the Strategic Planning of the Enterprise Computer Security	-Computer security in organization -Strategic planning
(Chunpir et al. 2014)	Using Soft Systems Methodology (SSM) in Understanding Current User-Support Scenario in the Climate Science Domain of Cyber-Infrastructures	-Cyber infrastructure for user support issues
(Damenu & Beaumont 2017)	Analysing information security in a bank using soft systems methodology	-Information security in the banking sector
(Sorensen et al. 2010)	Conceptual model of a future farm management information system	-Information system in farm management
(Presley et al. 1998)	Participative Design Using Soft Systems Methodology	-Organizational system
(Hillier & Vogel 2003)	Soft Methods for Systems Projects in SMEs	-Information Systems projects -Small and Medium Enterprises

(Kamsah & Wood-Harper 1999)	Soft Systems Methodology for Modeling Business Processes in EDI Implementation	-Business process in system implementation
(Probert 2003)	Soft Systems Methodology, Phenomenology and Information Systems Development: A Critical Analysis	-Information System development -Phenomenological development
(Niu et al. 2011)	Using soft systems methodology to improve requirements practices: An exploratory case study	-Requirement practice in organizations
(Mingers & Walsham 2010)	Toward ethical information systems: The contribution of discourse ethics	-SSM role in humans ethical information system
(Saad et al. 2002)	Soft systems methodology: A conceptual model of knowledge management system initiatives	-Knowledge management
(Mehregan et al. 2012)	An application of soft system methodology	-SSM use in different organizational systems
(Winklhofer 2002)	A case for soft systems methodology. Information analysis & information systems evaluation during organizational change	-Organizational change of information analysis -Organizational change of information system evaluation
(Bena et al. 2017)	Implementation of Soft System Methodology: Lesson Learned from Case Studies	-For safety performance evaluation in complex organization -Valuable insights into the different stakeholders -Solving organizational chaos

Table2. Lists of mostly used SSM uses in IS field

As we can see from the above table, most of the uses of SSM in the Information System field from the last filtered literatures are listed and they are generalized in four main uses, based on their relatedness of the study and concepts, namely organizational systems, educational, security and e-service uses.

Therefore, the first four mostly used SSM uses are: for

- Organizational systems
That is eleven studies including like information system quality, information management, knowledge management, information systems in different sectors, information system evaluation like for performance, organizational change, information system development, information system implementation
- Education
That is three studies including like educational technology and innovation, module evaluation, student centric learning
- Security
That is four studies includes like computer security, cyber security, infrastructure security, information security of banks
- E-service
That is three studies includes like e-governance, e-learning, personalized learning

When these are analyzed based on the literatures, most of them are dealing on these points and around four of these uses. One can learn from this is that, one should use SSM for innovative purpose in massive because it mostly related with new technology and product development. So there is a need of assessing its practice in organizations. A great emphasis should be given in using SSM for what purpose, understand the philosophy behind, and need to understand how it is working.

Therefore, SSM alone cannot give the needed result, if there is a governing tradition inside the company to change the working habit of the organizations. So, other uses related to Soft System Method integration with theories and techniques or methods should be assessed for future study.

CONCLUSION

Generally, Soft System Methodology helps to define the unstructured difficult conditions in the institutions to be resolved and frequently contain socially related feeling & hence, cannot be solved by the “hard” approaches or techniques. According to Mehregan (2012) the soft system methodology focuses on the complicated managerial activities and practices, investigating loosely (unorganized) problems in a wider outlook, and uses to give a pure way to the modifications that must to be did to formulate the ultimate problem conditions. According to Watson (2012) at the time of using Soft Systems Methodology it takes the leading to grasp method based instructions and conditions of issues. It provides a consideration of how individuals attempt to recipe a goal oriented activities concerning the analyses of the conditions (Holm and Fredrick, 2011).

The existing literatures were systematically refined and analyzed with the objective of reviewing those publications with Soft System Methodology use in Information System discipline. This review showed the four most Soft System Methodology uses in the IS field and most of the time it has been used for security, e-services, education and organizational systems.

The benefits of applying Soft System Methodology permits to make it easier the organizational set up and structure of problem conditions of complex institutions and compels the user to do in elastic and smooth manner, it is also an obligatory instrument to be used when there is very difficult security problems (Diaz-Parra et al., 2014). Those individuals used Soft System Method for a deliberate designing of organizational Computer Security.

To sum up, combining other methodologies with SSM will create a meaningful result for solving complicated problems and the diverse view of customers complaints in a more innovative and systematic way. Once these actions are applied, it will open a new road for the adoption of information system in the organization with less effort. Soft Systems Methodology has an answer for tricky problems and uses system thinking approach concepts and ways. Soft System Methodology mainly used in different sector of management, health related systems, in various systems as a whole. Therefore, there is a need of investigating new areas in Information System field which will use soft system methodology to integrate the social issues in a different way.

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