

COMPOSITE CASE STUDY DEMONSTRATING THE USE OF SOFT SYSTEMS METHODOLOGY FOR ANALYSING INFORMATION MANAGEMENT

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Abstract

The paper an example of how soft systems methodology was incorporated as part of a systems analysis for a software development and information technology outsourcing company. As an interpretive approach suited to understanding ill-defined problems in real world situations, the methodology revealed problems with power and internal politics in the company. Even though it was found that these problems could not easily be addressed, the very fact that they were revealed is seen to be of value.

Key words: soft system methodology, power, politics,

INTRODUCTION

At the Second Annual Rank Xerox Lecture of the Worshipful Company of Chartered Secretaries and Administrators, Checkland (1988) has pointed out that ... information systems has been dominated by the method of hard systems tradition (Checkland, 1978), changes in technology make problematical the view of organization as the purposive-rational, goal seeking matches which that tradition implies ... and he concluded that we are at a stage where soft systems thinking has a role to play both in thinking about and carrying out information systems development (in Lewis, 1991).

This paper explains the ways in which soft systems methodology (SSM) made a contribution to understand information systems development practices in a real word situation, namely, JKL Associates. In doing so, first it looks at a brief over view of SSM followed by the method of analysis. Second, it outlines the background of problem situations of JKL Associates. Third, It attempts to understand the ill-defined nature of the JKL Associates in applying the SSM and finally it drafts a feasible and desirable changes, with consideration given to the influence and constraints of other systems have been proposed as a series of recommendations, which is followed by a conclusion to the paper.

It should be noted at the beginning that all names and features that could be used to identify persons and firms have been changed to ensure anonymity and confidentiality.

REVIEW OF SOFT SYSTEMS METHODOLOGY

Soft Systems Methodology (SSM) is a process of inquiry developed during the 1970's by Peter Checkland of Lancaster University for analysing human-related activity in ill-defined situations due to the failure of Systems Engineering in less structured environments. Peter Checkland (1981, p.318) defines SSM as "Systems based methodology, for tackling *real-world problems* in which known-to-be-desirable ends cannot be taken as given." This approach has been further developed through application and research to become a relevant methodology for use in the 1990's (Checkland & Scholes, 1990).

Soft Systems Methodology is a seven-stage, heuristic problem solving process of inquiry resulting in discussion and action for change. The stages may be initiated and repeated at any stage as understanding and insight into the problem is enhanced, as described by Forbes (pforbes/cpsm/ascm2.htm#abstract p.19) and Hutchinson (1997, p.26). According to Checkland these steps are interrelated as a "mosaic of activities having certain relationships with each other rather than a required sequence of activities" (1981,p.19).

The benefits of applying SSM to analyse real world situations which are problematic nature is that its interpretive ability and the methodology is well recognised as being an approach which is; inclusive of members of the organisation (Finegan, www.csu.edu/au/ci; Forbes, 1995), and is unique to the context of each situation (Finegan et al.; Forbes, 1995; Ledington & Donaldson, 1997; Stowell & West, 1994). Benefits from this member participation include developing organisational learning skills through involvement in the process, as well as improved problem ownership and commitment to change. Furthermore, recognition of the interpretive context-dependency of the problem provides opportunities for organisational members to discuss and question their perceptions of the situation in relation to the functions of the organisation, enabling opportunities for practicable change to be recognised and acted upon.

The SSM is both an activity based and information-focussed approach. It is therefore particularly suited to inquiring into the organisation's information system. Checkland and Scholes comment that "SSM offers a process through which an organization can continually reflect upon its aspirations and tasks, thus continually reviewing its information strategy" (1990, p.313). This is also supported by Finnegan (www.bf.mit.edu.au: 81). Even though soft systems methodology has been influential, it has also undergone criticism not being considered the constraining effects of existing power relations, and likely to be geared to the interests of the powerful (Jackson, 1992). However, in a later version of SSM, Checkland and Scholes (1990) include some analysis of power and conflict issues.

Method of analysis

Data on the information system, gathered through interview and inventory, has been analysed using the seven-stage process of SSM. This analysis enquires into the social, power and structural systems in the organisation that may impact upon the targeted information system. An initial interview with the staff of the organisation has been conducted under the themes such as, the history of the organisations' information systems, the hardware, software, data (database), procedures, communications and the people, and the challenges facing the organisation's information systems, and possible solutions. An analysis of the current situation has then been presented pictorially in a 'rich picture', illustrating communication flows within the system and also highlighting the concerns of stakeholders.

A 'root definition' describing the primary processes and functions has been developed using a 'CATWOE analysis'. The emerged definition has then been compared with the developed 'conceptual model', an illustration of the process flow and dependencies of the primary functions described in the root definition. The comparison of the root definition and conceptual model has further led to the inclusion of an ideal rich picture within this research to illustrate a possible ideal situation.

Background of JKL associates

Former software development employees of Campbell Klark Accounting Computing Services (CKA) established JKL Associates in 1997. JKL specialises in software development for a diverse range of vertical markets including airline revenue accounting services and local government systems. JKL also provides hardware and support services enabling client to outsource their Information Technology (IT) departments. Head office is located in Perth with expansion to Sydney in 1995 to service eastern markets. Initial concerns were expressed as a result of stagnation in software sales figures. Results indicate that following a significant increase in sales, a general trend of relatively fixed figures have been evident. The central focus for this analysis has been identified as the organisation's information system.

JKL is owned and managed by three partners with 25 general staff. Due to the nature of the organisation all staff are computer literate with skill level and areas of expertise dependent upon position within the organisation. As a consequence of the size of the business individuals perform a number of roles and therefore have access to a diverse range of information. The majority of staff are located in head office in Perth, with a small group working from the Brisbane based office.

Application of SSM for JKL associates

EARLY IMPRESSIONS

Initial interviews with the client elicited information about the general structure and operations of the organisation, information systems, individuals and groups of individuals involved. These key players within the change programme were identified as follows.

Client

JKL Associates has been identified as the client for the proposed study.

Problem Solvers

Partners, Richard Hudson and Victor Antheny have been identified as the current main problem solvers or change managers. This recommendation is based upon their position in the organisation having the rank, through partnership, to affect change and provide support to one another during the process. In addition other advantages include extended length of service within the organisation since its establishment in 1985, indispensability of their positions, and socially, both parties are highly-regarded by other members of the organisation and also within the client base.

Problem Owners

Those groups with ownership to the problems and opportunities include all the partners, general staff, and the clients. Some groups are adversely affected by the current situation, whilst others receive benefits. Significant power appears to exist between opposing group's i.e. those either negatively or positively affected by the current situation.

Overall Early Impressions

Early impressions did not clearly indicate issues or problem areas to be addressed within the information technology system. Initially, it was observed, through norms of behaviour, that a balance of power had been created, in that one partner had become, in effect, a defacto senior partner, to the detriment of the other partners. The senior partner exercised political power while innovation and application of the technology, including day-to-day management skills were observable in the tasks of the other partners. Implications of this situation within identified areas of concern were considered during subsequent stages of the investigation.

RICH PICTURE

The rich picture provides a pictorial overview representation of the current situation, indicating the structural elements, flow of communication, and the climate or individuals' interpretations of the situation.

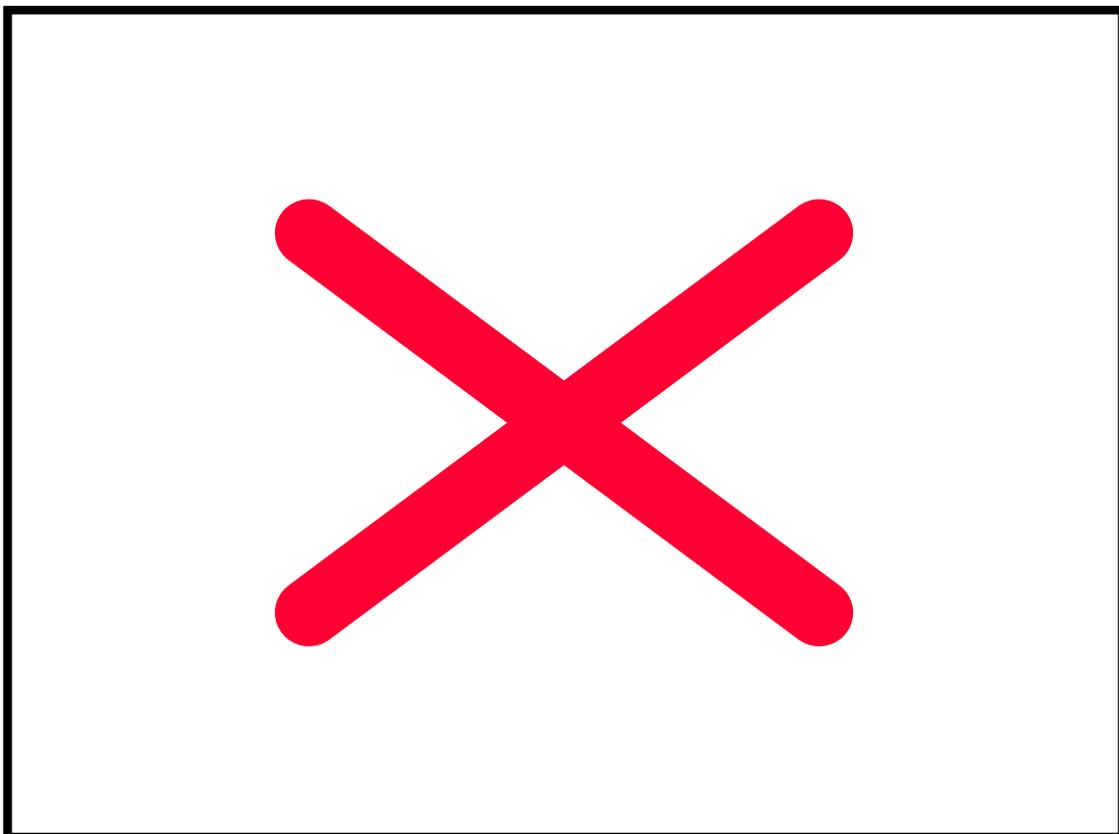


Figure 3. Illustrates the rich picture for JKL. It is evident that staff, clients and some partners perceive a number of concerns. Information flows are noted as being generally central with some one way communication flows existing in such areas as development and at managerial level.

CATWOE Analysis

An analysis of the constitution of those individual elements in the system assists in developing a comprehensive root definition. This is achieved or can be checked through a CATWOE analysis, an acronym for those elements in the system, see Table 1.

	<u>DESCRIPTION</u>	<u>JKL AND ASSOC.</u>
C	Customers- the people affected negatively or positively, within or outside the system.	- clients - employees - partners
A	Actors- the people, in roles, who carry out the activities.	- employees - partners
T	Transformation- the process of converting inputs to outputs.	- the design, development, manufacture, market, sales, installation and training in application software, and the maintenance and support of that software.
W	Worldview- the interpretation or view of the environment in which the system is placed.	- commercial enterprise in a niche market.
O	Owners- Those with the power to terminate operations.	- partners
E	Environment- the environment in which the system is placed.	- competitors, information technology industry, rapid innovation.

Table 1: CATWOE analysis.

Table 1 outlines the key elements in the system, which has then been applied to develop the Root Definition below, describing the functions and purpose of JKL. The analysis indicates a wide range of people and the key functions of the organisation, which are also affected by the current situation.

Root Definition

The root definition provides a statement of the elements, which their function and purpose in the system. Forbes (1995, p.8) describes the root definition as that " which defines what the activity is and why it can be held to be meaningful. Figure 2 describes the root definition for JKL Associates. In developing the root definition the information system is considered as part of an open system. Therefore other relevant systems have also been examined to assist in designing the root definition.

The root definition is: JKL and Associates is a privately owned company within the I.T. industry which: designs and develops for a range of vertical markets, using PIC operating software with a Windows front end format; produces and sells the software; installs and train clients in the use of the

software; provides ongoing support and maintenance to clients through Internet access; and provides a broad range of associated I.T. services to clients including outsourcing of I.T. services to JKL, Internet Service Provision and training courses in Windows applications; in a dynamic and competitive market to support clients in establishing and maintaining effective information technology systems.

Other relevant systems include the structural systems as the formal design; policies, procedures and patterns of authority have been noted as impacting upon the information system. The technical system has also been considered to identify the primary functions and activities of the organisation and the information system, especially in regard to equipment and processes. Furthermore, the psychosocial system has been addressed to account for patterns of communication, roles of individuals, networks, and politics and power.

CONCEPTUAL MODEL

The conceptual model (see fig. 2) illustrates the flow and dependencies of the activities described in the root definition. This has been achieved by identifying the primary tasks and transformations and making links between these. Furthermore these tasks have been grouped into three systems those being, the knowledge, operational and monitoring systems of the organisation.

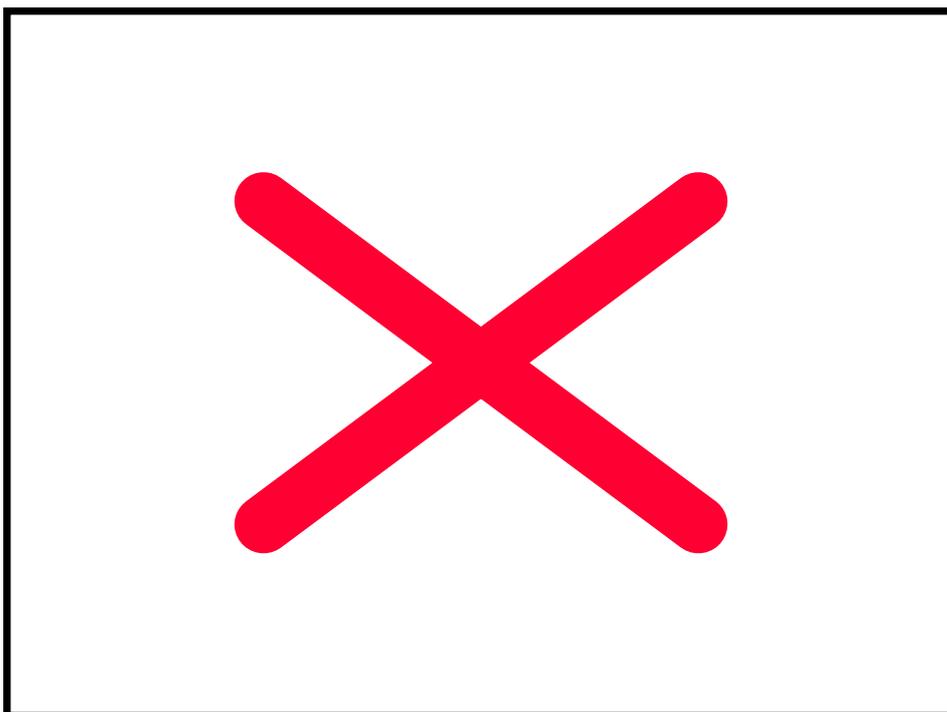


Figure 2. Shows the conceptual model for JKL.

It is noted that the primary knowledge functions are to design and develop software. The operational functions include production, marketing, sales, installation, training, maintenance and support, as well as outsourcing and other training. The help desk-tracking programme achieves monitoring functions.

Issues of Concern

Issues of concern were identified after comparison of the rich picture with the conceptual model, which highlights the following areas.

- Security of data- all employees have full and unrestricted access to all data including
- Reactive response to research and development- No coordinated approach exists for development function or key responsibility in a central location. Several individuals working on areas of interest without input from clients. Generally, a range of clients will repeatedly request an innovation, often to different individuals, before considered for development.
- Millennium bug not tested for- Up to date a proactive response to Y2K compliance has been taken however the final step of testing systems is not planned.
- Inefficient use of Internet- Internet currently used for a range of functions however is not being currently fully utilised.
- Hardware updates- Plans for hardware updates exist, however the central file server at head office is now at a minimum level without a timeliness for its update. This is a key piece of hardware.
- Flow of Communication- A significant one way flow of information and resources, detrimental to the operation of the organisation, exist at upper level management.

IDEAL RICH PICTURE

The ideal rich picture (see Figure 3) addresses areas of concern. This shows external elements such as clients and prospective clients are more easily able to communicate with the organisation. As JKL tailor design software to suit the needs of individual companies increased input from those parties is an advantage. This is demonstrated through the support and development divisions illustrated above. A greater awareness of the external environment has also been achieved through improved awareness of competition. Internally, human resource and finance functions are secure. A two-way flow between upper management also demonstrated improved functions within the organisation.



Figure 3. Ideal rich picture.

This rich picture shows that management is operating with a common mission. The flow of information has now become predominantly two-way, with the external boundaries having been opened to allow external elements to assist JKL in developing business rather than hindering it.

COMPARISON OF RICH PICTURE AND CONCEPTUAL MODEL

A comparison of the ideal rich picture and the conceptual model identify areas for improvement and change. The conceptual model identifies the processes that JKL Associates undertake, however the ideal rich picture identifies the flow of information required performing those activities effectively and efficiently. A comparison shows of these figures demonstrate that two-way communication, achieved through a secure and centralised information system, is essential for the individual elements to function at their peak. This comparison also recognises that knowledge and resources exiting the system are also required to remain within the system for peak performance. Additionally, the integrity of the information system must be maintained in order to support these core functions.

Concerning power and politics, in legal terms the three partners have equal status in the affairs of the company. However, it was discerned that the apparent conflicts between partners, as perceived by researchers, revolved around the principle partner's domination over the other two by a concealing of vital information which were essential for the managing of day to day operations. This situation was made more difficult in that the senior partner was perceived to have vested interest outside the organisation other which may have compromised his position.

SYSTEMICALLY DESIRABLE AND CULTURALLY FEASIBLE CHANGES

The issues such as implementation of security procedures, clarification of interests roles and responsibilities, increase of internet exposure and continuing hardware upgrades have been suggested as a catalyst for reflection and debate upon possible areas for change. Confirmed changes however, will not be evident until the parties have undertaken these discussions.

The nature and extent of the change; the impact of the change on all systems; the ease of change; and culture be taken into consideration by the client when debating these changes. It is seen to be essential that the inequitable distribution of power and internal political force should be addressed when considering the change process.

CONCLUSION

This research was based around a simplified version of the SSM used as a management consulting approach to investigate the management of information in the organisation chosen by the researchers. The case study was based on the assumption that soft systems methodology is best used in a flexible and adaptable manner to suit the particular purpose of the investigation. Initial data were pictured by researchers and clients, in the form of cartoon style diagrams of the challenging situation being considered. These rich pictures were used as creative insights into developing the *root definition* of the system under consideration. Furthermore, when the rich pictures are compared to the resultant *conceptual model*, ideas for systemically desirable and culturally feasible changes were recommended.

We have noted that the soft systems methodology is weak in dealing with issues of power and internal politics. The analysis presented, in this case study demonstrated the conservative nature of this approach in dealing power and resultant domination situation among the partners of the JKL Associates. However, the very fact that issues of power and internal politics were clearly revealed in the rich pictures and subsequent discussions is more than just a beginning to solving these challenges. In a practical sense, the expression of a formally 'taboo' matter, is, in itself, a healing and a way forward. It is interesting to note that it was in the drawing and presentation of the rich pictures that the

issue of power come to the fore. In our opinion, this is an example of the importance of rich pictures in the soft systems process.

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