

A SOFT SYSTEMS CASE STUDY INVESTIGATING THE INFORMATION SYSTEM OF A SMALL BUSINESS AND DEMONSTRATING THE USEFULNESS OF RICH PICTURES

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ABSTRACT

Soft systems methodology is a creative, if minor, approach to organisational problem solving. As reported in this paper, SSM is used, in a flexible and individualistic manner, to analyse the flow of communication and the use of information technology in ABC & Co, a wholesale book and goods seller. Firstly, a brief description of the ABC & Co. provides historical background of the company with attention given to the use of information technology. The client, problem solvers, problem owners and overall early impressions of the flow of information in the company provides a starting point for the soft systems analysis. In my opinion, the more important contributions of SSM revolve around the use of pictorially metaphoric and potentially symbolic depictions of the situation in the form of rich pictures, and in the truth revealing power of, and the analysis necessary to create, the root definition. Hence, a diagrammatic summary of the organisation is presented in the form of a rich picture, highlighting the flow of communication and issues of concern. A root definition, developed from the main functions of the firm, summarises the primary business activity. Evolving from the root definition, the conceptual model logically analyses the tasks needed to successfully operate the firm. The conceptual model is compared to the rich picture, with similarities and differences observed. Arising from the conceptual model, an ideal rich picture is developed, incorporating systemically desirable and culturally feasible changes. Recommendations provide some practical strategies to enable the business to improve the flow of information in the organisation in order to remain competitive in the future. In concluding, I speculate on the possible power of rich pictures to reveal hidden aspects of organisational dynamics and to act as triggers for organisational development as shadow sides of the organisation are revealed.

INTRODUCTION

Soft systems methodology provides a useful process for analysing both quantitative and qualitative information in an organisation. This methodology is outlined and then applied to ABC & Co to analyse the use of information technology and the flow of communication in the company. Some recommendations arising from the analysis are provided to enable the company to achieve its strategic goals.

ABC & Co. is a small, privately owned Western Australian company which imports Christian literature and church goods to sell to (predominantly) Catholic churches, schools and individuals through its retail outlet, ABC Christian Shop. It began in 1973 - as an owner operated business by Ben ABC. 24 years later, the business has grown to include a staff of 13 and several specialised departments.

Being a small business, there is a flat organisational structure, with all staff reporting directly to the proprietor. The administration department receives orders from customers and passes them on to either the retail or wholesale department. It is also responsible for ordering stock, corresponding with customers and suppliers, processing accounts and preparing the fortnightly payroll. The wholesale department receives inventory from overseas and processes and packages orders from larger customers such as churches and schools who purchase goods wholesale. It also supplies inventory to the retail department. The retail department sells goods to the public and processes packages smaller orders. Figure 2 highlights the organisational structure of the firm. As ABC & Co. has grown, it has sought to remain current with information technology suitable and useful to operating a small business. The firm believes that staying up to date with contemporary communications technology and procedures that will enable it to be competitive in the local and global marketplace.

REVIEW OF SOFT SYSTEMS METHODOLOGY

Underwood (1996) and Hicks (1991) note that soft systems methodology (SSM) was developed by Peter Checkland in the 1960s with the aim of applying systems engineering principles to business problems to overcome some of the deficiencies evident in traditional systems analysis. Forbes (1995) believes that SSM is a useful procedure as part of an organisation's strategic planning process. Finnegan (1995) explains that:

the concepts (of SSM) are based on practical application and experience in a wide variety of complex managerial systems. The methodology is designed to allow the human element of

such systems, which is typically unstructured and poorly defined, to be incorporated into system design work.

The emphasis of SSM is to deliberately keep the problem as unstructured as possible for as long as possible to allow for alternative perspectives on both the problem and solution to emerge (Finnegan 1995). Platt and Warwick (1995, p.19) recognise that “SSM deals with problem formulation at the strategic level. It partly aims to structure previously unstructured situations, rather than to solve well-structured problems”. Checkland and Scholes (1991) identify a seven stage process of inquiry.

The strength of SSM lies in the application of a methodical process which considers qualitative information to facilitate systemically desirable and culturally feasible changes (Hicks, 1991, p. 252). Flood and Jackson (1991, p. 177) conclude that “SSM is essentially a means of introducing some ordered, structured systems thinking into the flux of events and actions that is everyday life”.

EARLY IMPRESSIONS

The company is continually looking for new techniques and applications that can advance and enhance their use of technology, including online systems, with the net result being beneficial to the company in terms of sales and information flow.

Concerns were raised by retail staff with periodic inventory shortages. Occasionally stock requisitioned from the warehouse was not available. With ABC & Co.’s commitment to excellent customer service, this was seen as a hindrance to maintaining a high standard of service. Concern was also expressed by warehouse staff with occasional inventory shortages. Stock is ordered by the proprietor when alerted to low supplies by warehouse staff. Orders placed with overseas suppliers sometimes remained in the country of origin until the company had a sufficiently large enough order to take advantage of cheaper freight shipment charges, resulting in delays and a prolonged time period between order and delivery. Stock required urgently was delivered by air, at a significantly higher cost to the firm. Shortage of storage space was also highlighted as a concern by warehouse staff. Although the premises is large enough to store inventory, floor cracks appeared due to stock weight, alarming both warehouse staff and retail staff in the premises below.

OVERVIEW OF INFORMATION SYSTEM

The information system of an organisation should facilitate an efficient flow of communication and enable the firm to function more efficiently. It is a tool that provides the means for the company to organise, manipulate and analyse information that can be used to improve business operations and decision making. Gates (1996, p. 35) acknowledges that “small businesses have been the greatest beneficiaries of computers, because low-cost hardware and software have permitted tiny outfits to compete better with large multinational corporations”.

RICH PICTURE

The rich picture provides a pictorial representation of the interaction and flow of communication between the internal functional areas of the business and the external entities. To arrive at the rich picture the following categories were considered.

Issues of Concern

- threat from Internet commerce
- shortage of warehouse space
- flow of communication between retail and wholesale
- stock shortages experienced by retail and wholesale department
- expand operations to interstate?
- what strategies do competitors intend adopting?

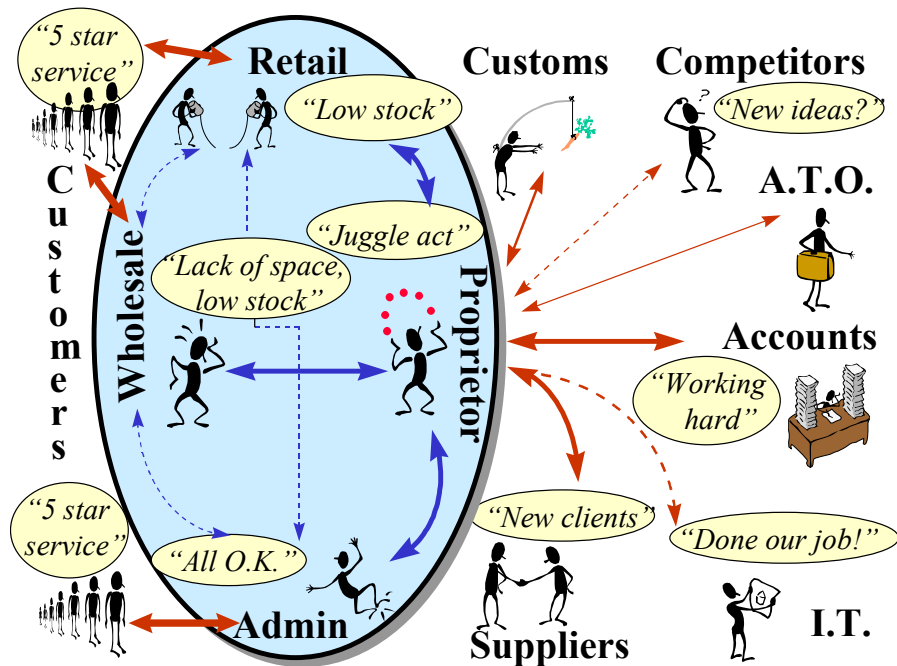


Figure 1. Rich picture illustrating the flow of communication in ABC & Co. between the company's internal and external entities. Staff and service providers' responses highlight areas of concern.

External Flow of Communication

From the rich picture, figure 5, it can be seen that ABC & Co. has developed good customer relations and provides excellent service, demonstrated in the strong communications links. The competitors are looking for new ideas and marketing strategies to stay competitive with the firm. A broken communication flow indicates that ABC & Co., while staying informed (as much as possible) on competitors' strategies, does not actively seek to communicate with other firms in the same market. The company maintains strong communication links with suppliers by is aware of the threat of direct customer access to suppliers via the Internet. Good communication is maintained with the information technology supplier, although, because the firm has not been fully aware of its requirements, the information technology firm has not supplied a wholly suitable software programme. (This will be discussed more fully later). Preparation of general purpose financial statements and tax returns is outsourced to an accounting firm. Good communication is maintained with this firm. Satisfactory communication is maintained with regulatory bodies (Australian Taxation Office and Australian Customs Service).

Internal Flow of Communication

The proprietor is actively involved in all areas of the business and is well informed on concerns expressed by the different departments. Like many owner operated small businesses, the proprietor likes to participate in the day to day running in all areas of the business. The administration is operating according to the current business's procedure. Concern is expressed by the both retail and wholesale departments regarding inventory levels.

ROOT DEFINITION

Hicks (1991, p. 239) defines a root definition as "a concise verbal description of the system" under investigation. Sasse (1996) acknowledges a root definition can describe four different systems - primary and issues based systems and service and non-service systems.

ABC & Co. is a privately owned, limited liability commercial system which imports Christian books, church goods and religious material from overseas suppliers (in accordance with government regulations) and sells and distributes these goods to churches, schools and individual customers in Western Australia through its retail outlet ABC Christian shop.

CONCEPTUAL MODEL

The conceptual model emerges from the root definition as the ideal system, "a notional entity which could adapt and survive, via a process of communication and control, in a changing environment" (Checkland, 1989, p.284).

Underwood, 1996 recognises that the criteria for this model must be efficacy, efficiency, effectiveness, ethicality and elegance.

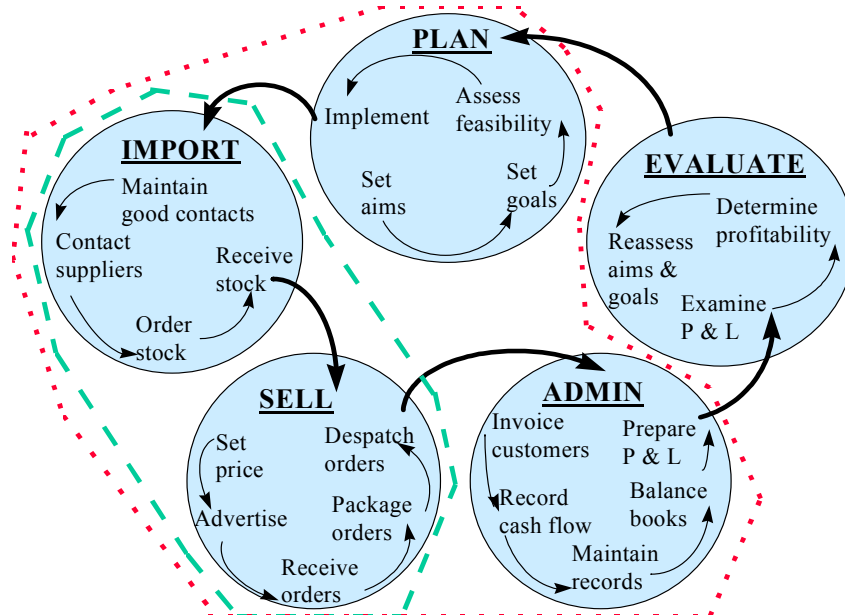


Figure 2. A conceptual model highlighting the main functions of ABC & Co. This model incorporates the operational, monitoring, controlling and formulating activities of the business.

The conceptual model shows the two primary business operations of the firm, namely importing and selling. In order for importing to take place effectively a number of secondary activities need to occur. Good contacts with suppliers need to be maintained, both in terms of effective communication links and access to a diverse range of relevant suppliers. Suppliers need to be contacted in an efficient and timely way so that stock may be ordered. Once the order has been placed, stock is received from overseas suppliers.

The selling process involves establishing retail prices for customers and trade discount policies. Inventory is then advertised, outlining product line and price. Catalogues are distributed to known customers and advertisements placed in publications that access target groups. Orders are received, packaged and dispatched to customers. The planning and administrating functions help the primary business activities to operate effectively and efficiently. Administration supports both importing and selling. It records transactions to and from suppliers and customers, maintains these records and provides information for the preparation of general purpose financial statements.

Planning involves setting broad aims (both long and short term) for the business and establishing strategies and objectives to achieve these aims. These objectives need to be realistic and achievable so that they can be effectively implemented.

Evaluation is an important phase of business operations in that it provides an opportunity to assess the aims and objectives of the firm in the light of actual performance. This may be measured in terms of profitability or other targets. The evaluation process feeds back into the plan phase to provide information for new business aims.

RICH PICTURE AND CONCEPTUAL MODEL COMPARISON

The new ideas being sought by competitors provides a challenge for the firm to maintain and develop new strategies to remain competitive in the future. This will impact on the planning stage of the conceptual model. The new clients being sought by suppliers acknowledges that they are looking for new business opportunities to expand their operations. This again impacts on the planning stage by encouraging the firm to maintain strong communication links with these overseas firms.

The recognition of discrepancies between the rich picture and the conceptual model allows the firm to modify its current business practices and develop new strategies to cope with future challenges. This enables more informed problem solving techniques to be used and equips the business with information to communicate to relevant support firms such as the accounting firm and the information technology firm. They in turn will be better able to provide services tailored to the unique requirements of ABC & Co.

From the rich picture it can be seen that good communication links have been established and are currently being maintained with customers and suppliers. Therefore, the importing and selling functions of the business are operating efficiently, effectively and ethically.

The rich picture highlights staff concerns with inventory levels. Comparing this to the conceptual model, it can be recognised that although the administration department is carrying out its duties efficiently or effectively in accordance with current procedures, the ordering procedure may need to be reviewed to meet the requirements of the retail and wholesale departments.

IDEAL RICH PICTURE

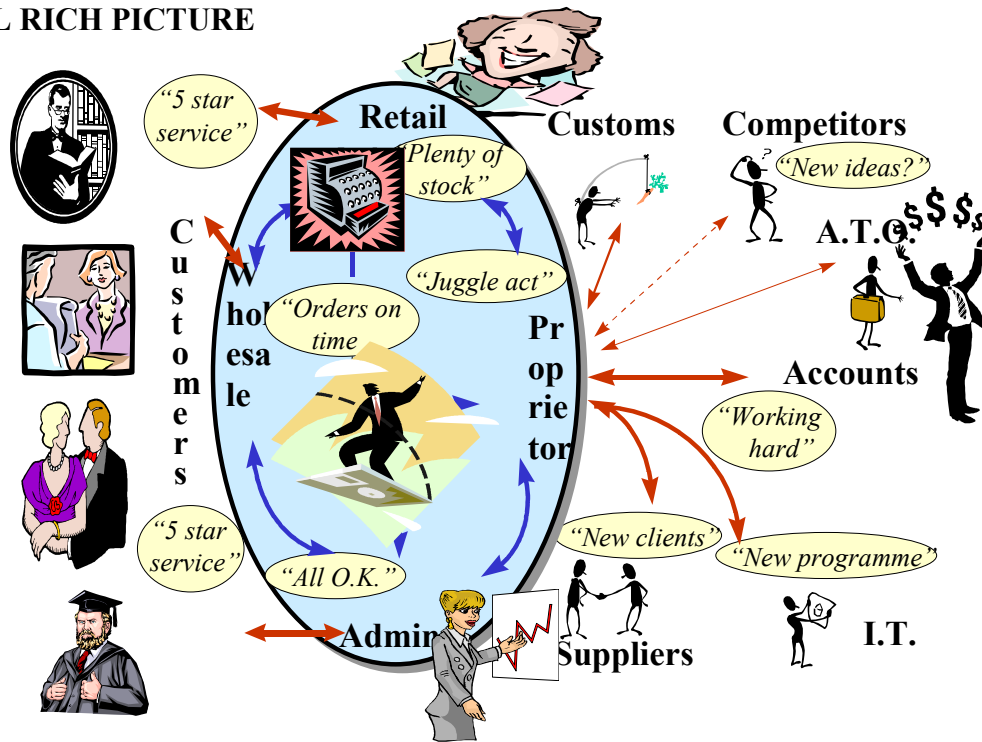


Figure 3. Ideal rich picture highlighting improvements in the flow of communications within the business. Enhanced procedures result in more contented staff.

The internal and external entities of the business remain the same. Improved ordering procedures by administration enable the warehouse to receive its orders in a more efficient and timely way. This in turn means that the retail outlet does not experience stock shortages. More informed communication between the company and the information technology firm has resulted in better understanding and more relevant and appropriate information system development.

SYSTEMICALLY DESIRABLE AND CULTURALLY FEASIBLE CHANGES

The recommendations that are suggested need to be systemically desirable and culturally feasible if they are to be successfully implemented. Underwood (1996) supports this by recognising that “changes which are not agreed on will not happen”. They should stimulate debate regarding desired improvements (Forbes, 1995).

Recommendations

- An inventory software programme that highlights inventory levels and alerts management to order more stock, taking into consideration delivery time from overseas. This will overcome the inventory shortages experienced by the wholesale and retail department.
Costing: \$2,000 for custom designed programme. (Cost not including internal labour. cost of data entry)
- Link to the Internet will facilitate e-mail communication with the suppliers and the customers
- Creation of a home page on the WWW will access both current and potential customers
Costing: \$30 per month maintenance fee
- Internet access will enable ABC & Co. to look for new business opportunities.
Costing: \$30 per month access fee and \$200 modem

It should be recognised that not all of the problems identified in ABC & Co. can be overcome. The lack of space identified by warehouse staff would require a large capital outlay (in the form of new premises) which is not feasible at this stage.

DISCUSSION

In conclusion, it can be seen that ABC & Co. is a small business that is currently meeting the needs of its customers. To do this in the future it needs to keep up to date with current communication and information technology. This will enable it to maintain its competitive advantage in the local and global marketplace. The Internet access and Web site will allow the firm to strengthen links with its existing customers, access a wider range of potential customers as well as facilitate efficient communication with its suppliers.

On a deeper level of analysis, I find it interesting to compare the rich picture with the ideal rich picture in a symbolic manner to reveal hidden or shadow aspects of the organisation. The first thing that strikes me is the exuberance of the figures in the ideal rich picture, compared to the dull and stressed postures of the people pictured in the rich picture. What can I make of this? Why does the shadow drawn under the oval representing boundaries of the system of the organisation appear so prominent in the rich picture but fade to be balanced in the ideal rich picture?

Perhaps the fact that all the people in the rich picture appear like little, two dimensional black/white figures creates the impression of an organisation in the shadows, with the words "low stock" strangely repeated. (Does this hint at "low morale", or "low outlook"?) The ideal rich picture gives an image or a metaphor of humour, fun, with three dimensional coloured-in people rising out of the shadows of the system to get on with life, buying and selling and allowing the money and ideas to flow. The words in quotation marks speak for themselves.

Is it too much to suggest that what is needed, at the deep level of human vision and morale, is not the repeated words of "low stock", but the ideal rich picture word "plenty" and the images of vital human beings being human and moving out of the shadows, customers and staff alike, into exuberant life, abundant life? Remembering that the last two words echo from the mouth of the founder of the activities that the organisation resources, the ideal rich picture could well provide an appropriate motivating metaphor for organisational transformation.

REFERENCES

- Birham, J. (1997). Pervasive Information Systems. *Communications of the ACM*, 40, (2). pp. 40 - 41.
- Brown, A. (1993). Soft Systems Methodology: A Case for User-Dependent Methodology - A Reply. *European Journal of Information Systems*, 2, (4), pp. 309 - 311.
- Checkland, P. & Scholes J. (1991) *Soft Systems Methodology in Action*. Chichester, John Wiley & Sons.
- Checkland P.(undated). *Soft Systems Methodology (SSM)*.
http://www.sfc.keio.ac.jp/~masanao/Mosaic_data/ssm.html
- Flood, R. & Carson, E. (1988) *Dealing with Complexity - An Introduction to the Theory and Application of Systems Science*, Second Edition. New York: Plenum Press
- Flood, R. (1991). *Creative Problem Solving: Total System Intervention*. Chichester, John Wiley & Sons.
- Finnegan, A. (1995). *Fuzzy Logic and Soft Systems Methodology - A Complex Connection*.
<http://www.bf.rmit.edu.au/~andrewf/fuzzyssm/fuzzyssm.htm>
- Finnegan, A. (1995). *Investigating Fuzzy Logic and Soft Systems Methodology*.
<http://www.bf.rmit.edu.au:81/~andrewf/fuzzyssm/invest.htm>
- Forbes, P. (1995). *Strategic Thinking: A Role for Soft Systems Methodology*.
<http://www.sls.wau.nl/vlk/pef/cpsm/ACSM2/acsm.html>
- Gates, B. (1996). The Road Ahead. *Working Woman* (21) 1. pp 34 - 40.
- O'Leary, T. & O'Leary, L. (1996) *Computing Essentials: Annual Edition 1996-1997*. New York: McGraw-Hill
- Hicks, M. (1991). *Problem Solving in Business and Management*. London: Chapman and Hall.
- Hutchinson, E. & Sawyer, C. (1992). *Computers: the User Perspective*. New York: Irwin.
- Kreher, H. (1993). Critique of Two Contributions to Soft Systems Methodology. *European Journal of Information Systems*, 2, (4), pp. 304 - 308.
- Kroenke, D. (1992). *Management of Information Systems*. New York: McGraw-Hill.
- Paller, A. (1997). Lessons Learned in the Data Mine. *Byte*, 22, (2), p. 40.
- Platt, A. & Warwick, S. (1995). Review of Soft Systems Methodology. *Industrial Management & Data Systems*, 95 (4), pp. 19-21.
- Sasse, A. (1996). *Defining the Problem: Soft Systems Methodology*.
<http://www-dept.cs.ucl.ac.uk/staff/A.Sasse/b123/chp4/chp4-.html>
- Sims, J. (1997). Evaluating IT: Where Cost-Benefit Can Fail. *Australian Accountant*, 67, (4), pp 29-31.
- Underwood, J. (1996). *Models for Change: Soft Systems Methodology*.
<http://linus.socs.uts.edu.au/~jim/bpt/ssm.html>
- Wilson, B. (1992). *Systems: Concepts, Methodologies and Applications*. Chichester, John Wiley & Sons.