

Stakeholder Analysis as a Medium to Aid Change in Information System Reengineering Projects

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ABSTRACT

The importance of involving stakeholders within a change process is well recognised, and successfully managed change is equally important. Information systems development and redesign is a form of change activity involving people and social issues and therefore resistance to change may occur. A stakeholder identification and analysis (SIA) technique has been developed as an enhancement to PISO[®] (Process Improvement for Strategic Objectives), a method that engages the users of a system in the problem solving and reengineering of their own work-based problem areas. The SIA technique aids the identification and analysis of system stakeholders, and helps view the projected outcome of system changes and their effect on relevant stakeholders with attention being given to change resistance to ensure smooth negotiation and achieve consensus. A case study is presented here describing the successful implementation of a direct appointment booking system for patients within the National Health Service in the UK, utilising the SIA technique, which resulted in a feeling of empowerment and ownership of the change of those involved.

Keywords: Case study, resistance to change, stakeholder identification and analysis, PISO[®], empowerment, SIA.

1. INTRODUCTION

Within the organisational environment, public and private sector managers are burdened with the demand for efficiency and economy from budgetary pressures [22]; and managers face constant pressure to efficiently use resources, save time, and ensure long-term effectiveness [4]. As such, specific alterations to policy and procedures can compel change or it can be the result of external pressure (e.g. government legislation, technological advances) [18]. Change can therefore be viewed as a necessary process with wide reaching effects.

Development and implementation of information systems can be viewed as a form of organisational change activity [21]. The importance of involving stakeholders within a change process has been well recognised by many authors [19], and involvement of system users in information systems development considered an important factor in improving its success for some time [10, 9]. Successfully managed change that encompasses organisational departments and effectually changes deeply entrenched cultures, combating resistance to change, is important.

As such the case study offered here is the result of stakeholders managing their own system change by utilising PISO[®] (Process

Improvement for Strategic Objectives), a method developed at the University of Sunderland. A stakeholder identification and analysis (SIA) technique also developed at the University, was employed to assess the influence stakeholders bring to bear on a system and to give focus to the effect of potential system changes on those stakeholders. This case study took place within the Tees and North East Yorkshire National Health Service Trust in the UK, and involved the introduction of a direct booking appointment system for mental health patients, which was the result of a Government initiative. The study discusses the changes required within the administrative and clinical areas, the impact on those involved in the change and the lessons learned during the process.

The following sections of this paper will view aspects of organisational change and its impact within information systems redesign, give a brief overview of PISO[®] and the social aspects of its framework, and then describe the SIA technique and how it was developed to consider the impact of system change on stakeholders. Consideration will also be given to the use of case studies to aid research. Full discussion of the reengineering of the system will not be discussed here, the emphasis being upon how the SIA technique aided in the successful change situation within the case study.

2. THE EFFECTS OF CHANGE

Change is a normal part of social and organisational life; "in a changing world the only constant is change" [4, p143]. However, within an organisational setting it can be "any alteration to the status quo in an organisation initiated by management, that impacts either or both the work and the work environment of an individual" [11, p. 10], therefore change has a far reaching effect. For Mullins [18] change within an organisation is inevitable due to;

- ◆ Demand for quality and a high degree of customer service and satisfaction
- ◆ Flexibility in organisational structure and management patterns
- ◆ Changing nature and composition of the workforce (p.822).

Change is, therefore, the accepted result of external requirements for speed and quality in services and goods and the internal pressure for economy and efficiency in providing those services and goods. There may even be increased turnover in critical staff [1]. The workforce could have to alter the way they work, change established patterns of behaviour, or

accommodate new workers [11]. Although Mullins [18] views the changing character and composition in the workforce as an instigator of change, this is also likely to be a response to change after considering Judson's [11] definition.

Luke [14] feels that "people-related issues" are often given too little attention in change situations. This notion is iterated by Buchanan and Boddy [3], who refer to a report by Kearney, 1990, where change in 400 British companies revealed only 11% as successful, and a main concern was "people issues". Stakeholders foresee change resulting in disenfranchisement and a redistribution of benefits; as a result organisational change often fails or a struggle persists between those supporting change and those resisting change [22].

3. RESISTANCE TO CHANGE

Resistance is an inevitable response to proposed change as people seek to defend the status quo if they feel their security is threatened [16]. If the proposed changes alter "values and visions" related to the existing order, then programs that satisfy one group could produce dissatisfaction in another [22, p.138]. In making decisions hidden goals and motives may be involved [12], thus some stakeholders may have a self-seeking agenda. To some organisational groups, the sharing of information they possess means losing influence and possibly power (Scarborough and Corbett 1992 cited in Juustila, [12]).

Mullins [18] iterates that people are generally uncomfortable with change and gives a set of common reasons for resistance;

- Selective perception. A person's own interpretation of a situation can give them a unique picture of an incident resulting in selective perception. This can create a biased view of circumstances resulting in resistance to any change.
- Habit. People respond to situations in a familiar way. Habits are also a means of comfort and security; as such any threat to regularity can result in resistance.
- Inconvenience and loss of freedom. Any change likely to be bothersome or impinge on freedom will incite resistance.
- Economic implications. People will also resist if there is any likelihood of reduction of pay and rewards or in job security.
- Security in the past. In times of confusion or worry or if faced with the unfamiliar, people may ponder on the past and wish to retain familiar and comfortable ways.
- Fear of the unknown. Faced with the unknown people will face anxiety or fear and are likely to resist change.

Luke [14] too advocates the consideration of human issues and adds: the reluctance to learn something new; the fear of doing one's job poorly because of changed demands; competition to use new equipment as well as a lack of understanding of new equipment; and overemphasis on improved productivity.

Resistance to change has proved to be one of the main causes of conflict within organisations, and has been traditionally seen as divergent opinions detracting from the proficiency of the organisation with the resistant worker being seen as subversive [23]. In a study at the University of Northumbria, Edwards and Walton [8] found that changes within the library system had negative impacts. They found that change had a "profound"

effect on various members of staff; conflict arose through suspicion between departments, stress to staff when departments converged and considerable conflict due to the rapid introduction of innovative teaching methods.

Mumford [19] sees resistance to change as a natural human phenomenon and proposes that people will welcome change if they believe it will bring personal benefit and oppose it if they feel it a threat. Mumford has long advocated user involvement in system design, arguing that most groups given the opportunity can effect major improvements in their work situations, and participation encourages good relations and cooperation [20]. Engagement of system users gives them feeling of ownership towards a system, giving greater commitment to it and less resistance to changes [15].

4. PISO® (PROCESS IMPROVEMENT FOR STRATEGIC OBJECTIVES) OVERVIEW

PISO® [7, 13] is a method developed at the University of Sunderland for the improvement of information systems to the satisfaction of both the system users and the organisation concerned. Employed in many successful implementations to date, much of its success is attributed to its engagement of the users of a system in the problem-solving and reengineering of their own work-based problem areas, and by taking into consideration the stakeholders of the system – those involved in its operation, those affected by it and those who have an effect upon it.

The PISO® method consists of a two-sided framework (Figure 1). One side is technical and incorporates structured techniques adapted from other well-known methodologies. The other side is social and supports the engagement of system stakeholders in the identification of a problem situation and the application of strategic objectives to give a workable solution to a system's problems. The framework has four different stages, numbered 0–3, with stages 1 and 2 running parallel. Each stage has a different view of the problem and gives explanation or suggestion of techniques for solving that element. The whole approach consists of thirteen steps; many of them can be iterated until consensus is obtained regarding any planned changes. A full discussion of the application of the PISO® framework within a systems redesign can be seen in Davison et al [5].

PISO® uses data flow techniques from structured systems analysis [13]. These are first used to create a data flow diagram of the current physical system. They are used again in the logicalisation of the data flow diagram for systems efficiency, to remove all physical constraints and thus develop a graphical representation of the policy behind the existing system.

Stakeholder analysis is advocated within PISO®, to meet the need to evaluate the relative importance of stakeholders to the system. Here the stakeholder groups prioritise their objectives to obtain a workable solution to the problem area, and these are synthesised into a set of operational objectives, or clear goals, to satisfy the majority of the relevant stakeholders. The operational objectives are then expressed in terms of dataflow notation and used as a basis for the final stage. It is here that a second logicalisation takes place, utilising a simple set of guidelines describing a subjective and creative process relying on the stakeholders' knowledge of the system and allowing their negotiated objectives to be applied.

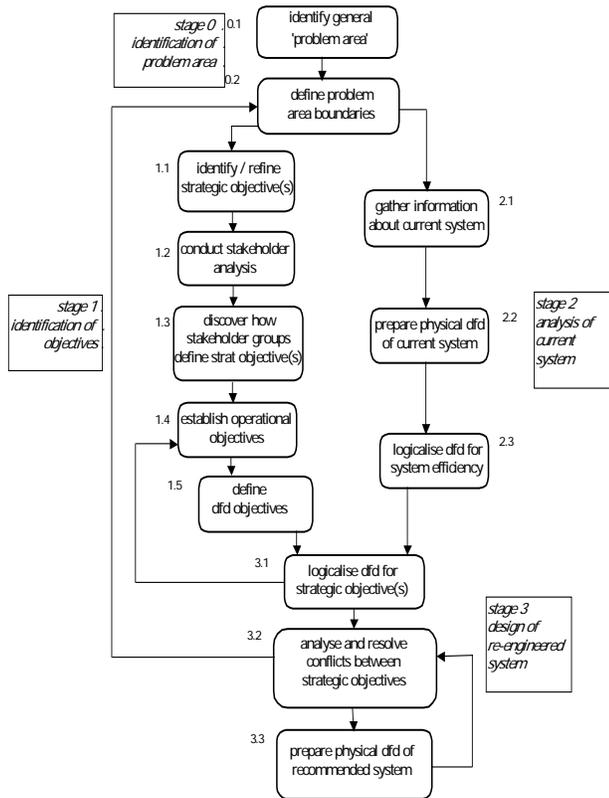


Figure 1. The PISO[®] Framework

Some iteration into previous steps can occur to ensure an acceptable model is achieved, and if conflicts arise the process can be iterated back to the first stage. The final step involves the preparation of a physical data flow diagram for the proposed system, and more than one physical representation can be prepared to gain consensus from all stakeholders for an acceptable system.

5. SIA (STAKEHOLDER IDENTIFICATION AND ANALYSIS) TECHNIQUE

Development of the SIA technique was as an enhancement to the stakeholder aspects of PISO[®]. Although PISO[®] advocates the involvement of stakeholders in the redesign of a system it did not specify a means for identifying who is a stakeholder within the area of improvement, relying on users to know who to involve, and in many cases identification was limited to those stakeholders appearing on the data flow diagrams. PISO[®] gave suggestions for stakeholder analysis but no tool or technique for this either. The technique was therefore initially developed to aid identification of stakeholders and to assess the likely impact of stakeholders upon a systems redesign. The outline of this initial development was presented at the SCI Conference 2002 [6], but will not be discussed fully here.

Having successfully piloted the initial SIA technique with groups of Masters students at the University, it was enhanced to reflect that changes occurring within a systems redesign would have an effect on related stakeholders and negotiation may be required. As a result, two more columns were added to the original SIA matrix (see fig 2) to allow for the plotting of likely system changes and to graphically display who would be affected, giving focus on areas that may require negotiation with relevant stakeholders.

Identification of stakeholders is carried out during the 'information gathering' stage of a project, and three stakeholder categories are considered, which subdivide into four stakeholder groups (fig 2). The Direct category consists of system engagers, who are those directly affected by an information system and who have the most impact on and interest in a system. They carry out the processes, are served by processes or serve processes. The indirect stakeholder category is subdivided into two groups; outside agencies and decision-makers. Outside agencies are external to the organisation and, though not immediately apparent within an area of change, could directly affect a system. Decision-makers are likely to be management within an organisation who ultimately allow any changes to be implemented. The Interface category forms a link between the direct and indirect stakeholders and consists of facilitators who are responsible for aiding the information systems development.

The purpose of stakeholder analysis is twofold; firstly, it ascertains the likely impact of stakeholders upon the system being reengineered by applying a combination of three attributes – power, legitimacy and urgency (based on the work of Mitchell, Agle and Wood, [17]) – to gain an understanding of the level of influence various stakeholders have within a system. By using a mix of the various attributes Mitchell et al identify seven groups of stakeholder. Those of low salience have only one attribute and are subdivided into dormant (power alone), discretionary (legitimacy alone) and demanding (urgency). Moderate salience has two attributes, which are subdivided as dominant (power and legitimacy), dependent (urgency and legitimacy) and dangerous (power and urgency). The 'definitive' group is highly salient and possesses all attributes. A later study by Agle et al [2] verified the validity of these attributes but using data supplied by CEO's of 80 large US firms, which confirmed that they were relevant to stakeholder salience.

The second purpose of stakeholder analysis is to assess the relevant priority and interests of stakeholder groups to distinguish those who must be included within immediate negotiation of change from those who may not require urgent attention. Projected system changes and their effect on relevant stakeholders can then be considered. At this stage, attention given to change resistance factors such as those described by Mullins [18], also assists the analyst in considering the effect of change on individuals to ensure smooth negotiation and to achieve consensus.

Stakeholder Category	Stakeholder Groups	Stakeholders	Stakeholder Attributes			Stakeholder Influence	Indicate Changes	Potential Area for Negotiation
			Power	Legitimacy	Urgency			
Direct	System Engagers The main stakeholder groups directly affected by the project. Those who carry out, are served by, or serve a process							
Interface	Facilitators Those responsible for aiding the systems development and negotiating with other stakeholder groups. Those guiding the PISO® method who may be initially gathered together because of the pending project							
Indirect	Outside Agencies Consists of Government or other regulatory bodies who may be the impetus for the impending system change. Could also include suppliers or contractors not apparent in area of change but could indirectly affect project. Decision-Makers Management body who would ultimately enable any change to be implemented. Likely to act on results of PISO® analysis and be responsible for if and how changes occur.							

Figure 2. Stakeholder Identification and Analysis Matrix

Stakeholder Category	Stakeholder Groups	Stakeholders	Stakeholder Attributes			Stakeholder Influence	Indicate Changes	Potential Area for Negotiation
			Power	Legitimacy	Urgency			
Direct	System Engagers	Patient GP Clinician Receptionist Secretary		x x x x	x x x x	Dependant Dependant Definitive Dominant Dominant	Given choice Change in referral process Decision making 'risk' identified Role changes) Role changes) Role changes)	Survey of sample patients Agree pro forma No change to clinic schedule Become part of change management; ownership resolves conflicts
Interface	Facilitators	ABC Project Lead ABC Analyst	x x	x x	x x	Definitive Definitive	New definitions New programme of work	- -
Indirect	Outside Agencies	Dept of Health NPAT Programme Lead	x x x	x x x	x x x	Definitive Definitive Definitive	Decision making target changes " " " Decision making	- - Changes to data collection to fit needs of mental health
	Decision Makers	IM&T Manager Performance Manager	x x	x x		Dominant Dominant	Decision making changes to system Decision making target changes	Funding outwith of Trust at initial stages of project Reporting systems agreed

Figure 3. Completed Stakeholder Identification and Analysis Matrix for Tees and North East Yorkshire Appointment Booking System

6. RESEARCH METHODOLOGY

Qualitative methodology was chosen for the research because it tends to be open-ended rather than controlling variables and looks at social settings in specific areas rather than the broad population [24]. Therefore it was ideally suited to explore how participants carried out PISO® projects within their own work-based situations and also later to discover the implications of using the SIA technique alongside the PISO® method.

As part of the methodology, case studies were used due to their flexibility; focus can be given to one case because of its unique qualities, or on multiple cases to make comparisons, build theory and make generalisations [25]. The early part of the research centred on cases using PISO® to gain an understanding of how it was utilised and how stakeholders were engaged during projects. Later cases were utilised in a more guided way to explore emergent themes [26] and also to evaluate the SIA technique. The study described here is one of the latter.

7. CASE STUDY

The case study is based within the National Health Service in the UK, and involves the development of an appointment booking process for mental health patients within Tees and North East Yorkshire NHS Trust. Patients traditionally wait for an appointment slot to be given to them by the relevant Healthcare Trust, but as part of a government initiative the introduction of a direct booking system was required to abolish waiting lists and provide improved patient access to services. A direct appointment booking system can be viewed as a shift in culture with patients now being faced with a choice and given the ability to book their own appointments. However, the change was seen to meet the needs of the patient within the parameters of the National Health Service and also to consider the complexity of the needs of patients within a Mental Health Trust.

Utilising the SIA technique the case study considers the impact and feelings of those involved within the change process and the

lessons learned during that time. An initial meeting of the staff involved within the change process allowed them the opportunity to express their concerns in view of the proposed changes, as it was seen to be imperative to address areas of concern in the early stages.

The SIA technique helped to identify the stakeholder categories 'direct', 'interface' and 'indirect', dividing them into system engagers, facilitators, outside agencies and decision-makers, as can be seen in figure 3. From this the relevant stakeholders were also identified with stakeholder analysis focussing on stakeholder impact on the system and considering the implications of change factors and power shifts. The remainder of this section will discuss in more detail the analysis and negotiation required and the SIA technique spotlighted where this was pertinent. Figure 3 shows the matrix developed by the project analyst.

System Engagers

This group identifies those directly involved within the project.

Patient. The project was centred on the needs of the patient but they could be regarded as a potential risk to its success as they have traditionally not been offered a choice of appointment. This could be construed as 'habit' as a possible resistance to change factor [18], as the notion of making a choice could have an adverse affect on the condition of a mental health patient. The patient was analysed as *dependent*, as they rely on being given an appointment slot in the current system and have no power to influence change. However, the invitation to become part of the change process is seen as an 'area for negotiation' to progress the changes required. To ensure direct patient involvement therefore, questionnaires were sent out to a sample of patients to evaluate their current experience of the service and to invite them to join the redesign team to ensure patients' needs were met.

General Practitioner. Although an external entity to the Trust, the GP is considered to be a *system engager*, as it is the GP's decision to refer a patient for treatment. The GP also needs to access the service in an uncomplicated way to ensure best treatment for the patient, but is dependent on the service to provide that treatment. Unlike Acute trusts where treatment is offered in most hospitals, the services of Mental Health are specialised and restrict referral options available to the GP. However, the GP must be involved in change to internal processes to ensure a seamless access to services and to agree referral pro forma.

Clinicians. This group was seen to pose the biggest risk to the success of the project. They have *definitive* influence, possessing all stakeholder attributes. Historically, they have great authority and influence within a hospital trust due to their speciality and position and change could be seen as "inconvenience and loss of freedom" [18] with some threat to their decision-making role. In the past the offering of patient's appointment choice has met resistance from this group, so it was seen as imperative to involve these stakeholders at the outset of the change process.

Receptionist and Secretary. Alteration to the way an appointment is booked is fundamentally an administrative change, therefore, this group of stakeholders must be involved. Their influence was seen as *dominant* and their acceptance of change was necessary. Factors that could affect their acceptance

of the project aims could include "security in the past" [18], the desire to maintain traditional methods; or "fear of the unknown" [18] in that new working procedures and technological change may affect their role and position. Ensuring this group becomes part of the change mechanism offers them the opportunity to take ownership of change as part of the decision making process.

Facilitators

This group includes the Project Lead and Project Analyst who have the responsibility to address issues and negotiate between stakeholder groups to aid in the implementation of the project. They are seen as *definitive* as they have an influence within the decision making process, have a legitimate purpose to ensure the success of the project, and their attention is required due to the pressures of time on the project. However, in this instance there is no requirement for negotiation with these stakeholders as the scope of their work is predefined. They do provide mediation between other stakeholder groups and require the ability to ensure that the right people are involved at the right time during the change process.

Outside Agencies

This group is not involved at team level, but their role is seen to be essential to the project success. They include the following;

Department of Health. The influence of this group, as a Government department, is seen as *definitive* as they are the impetus to the introduction of the direct booking programme, and have the power to change the direction, timescales and scope of the project. The *facilitators* ensure regular contact with this group to ensure changes are made in a timely way.

NPAT (National Patient Access Team). This stakeholder group is essentially part of the Department of Health, but it is their responsibility to disseminate changes to targets in the wider NHS. It is a national role but at local level responsibility is given to Programme Leads.

Programme Leads. They have a decision-making role, which allows local demographic issues and certain patient's needs to be taken into consideration. They disseminate information upwards to National level and downwards to Project Leads. Their involvement allows the 'specialist' needs of Mental Health patients to be considered and they can influence changes to definitions within the programme.

Decision-Makers

This group is responsible for enabling changes to be implemented.

Information Management & Technology Management. This stakeholder group will become involved where changes to IT data collection systems are required, although not directly involved in the current system their expertise is recognised as being required to implement changes. They have the power to influence required changes and also the time taken to implement such changes, and will also consider the cost implications of changes.

Performance Manager. This group has responsibility for relaying changes and providing data to the Trust Board. They influence how targets are measured and also how data is collected to show evidence of this. Again, not directly involved in the booking system they can become *definitive* stakeholders if they require specific targets to be met.

8. EVALUATION AND CONCLUSIONS

Within this study, the stakeholders were successfully identified and analysed, with the human mechanism to resist change and those involved within change management being considered. Stakeholder analysis was also seen to evolve as the project progressed and also ensured that the right people were involved in the change process at the right time to make certain the success of the project was not compromised.

The roles of the stakeholders are central to the system approach to achieve change. Change within this project involved changes to patient access, culture change for staff involved in the administrative process and for the Trust's operational structures. The facilitators bridged the gap between groups. The lack of information and involvement in projects that involve change often result in feelings of isolation and resentment; however interaction between staff in this study and their involvement at each stage of the implementation proved to be important. The outcome of the study was a feeling of empowerment and ownership of the change by staff within the team, and through their involvement in decision-making at local level. Identification of stakeholders in the early stages supported the process of stakeholder analysis, which discovered the impact particular stakeholders had within the system.

By focussing on change the SIA technique helped to highlight where negotiation of a pro forma was needed for the referral process and also emphasized where close and early negotiation was required with groups who had in the past resisted such changes. Stakeholders not directly associated with the direct booking system were also considered and involved in the change process. A further important aspect was that patients too were given the opportunity to effect change by representative groups becoming part of the redesign team. Change resistance factors were exhibited in the project but early attention given to these factors helped to allay any problems and aided a timely implementation.

In view of the success of this case study and others, the SIA technique is currently being used in selected commercial PISO[®] implementations. With repeated use refinement is being made as trials continue. The SIA technique has recently been registered as pisoSIA[®] and its own framework has been developed.

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