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Implementation of an information system within a bureaucratic environment: an understanding of the human issues

W.J. Marais
Department of Defence
Pretoria, South Africa
williemar@absamail.co.za

C.J. Kruger
Department of Informatics
University of Pretoria
Pretoria, South Africa
neels.kruger@postino.up.ac.za

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Key words: Information system implementation; bureaucratic environment; soft issues; human issues; romantic appreciation; adoption and use

1 Introduction

Originally, implementation of computerized information systems (IS) was considered to be a purely technological issue, that is technology installation (Peng, Chen and Lin 2001:55), with the emphasis on ensuring that technology meets user requirements (Southon, Sauer and Dampney 1999:33). There has since been general acceptance that the implementation of IS within an organization requires not only consideration of the hard, technical issues, but also an understanding of and insight into the soft, organizational and human issues involved in the introduction of technology (Hackney and McBride 1995:17). Human issues exist in any type or size of organization and their extent depends on the people involved, while organizational issues may vary widely depending on issues such as organizational culture, politics, size and level of bureaucracy (Lorenzi and Riley 2003:198). Therefore, the context within which an IS is implemented affects its acceptance (i.e. adoption and use) and 'ultimate value' to the organization (Hackney and McBride 1995:18). By highlighting the importance of human action and viewing the organization as a 'living organism with powerful internal forces and conflict', Dahlbom and Mathiassen (1993:120) provide a *romantic* view of IS implementation that considers it to be 'an organizational political process' that cannot be addressed by providing and rigidly adhering to precise specifications (Du Plooy 1996:4). The mere definition of the human and organizational content of the issues that are to be addressed is a misapprehension of the psychological and organizational complexity of the context in which the implementation takes place (Hornby, Clegg, Robson, Maclaren, Richardson and O'Brien 1992:166).

While nearly all previous analyses and case studies have focused on modern organizations that are concerned with performance in a competitive environment (Southon *et al.* 1999:34), the context of this study is an organizational culture formed by a bureaucratic tradition. A bureaucracy, or multi-layered (hierarchical) organization with a rule-bound culture, is also known as a 'control culture', with power as the primary motive (Schneider 2000:26). A typical example is the military environment, which has very clear lines of authority and well-defined rules. It tends to be *mechanistic*, without being sensitive to the *romantic* needs of its employees, and resistant to change (Du Plooy 1996:13) and, therefore, poses special challenges for the implementation of IS. In this article there is not only a reflection on and confirmation of some of the traditional human issues; it is also suggested that our understanding of the relevant issues in a bureaucratic environment needs to be improved.

In an attempt to identify some of the special challenges and to provide an understanding of the human issues involved, the partial implementation of an IS within a typical bureaucratic environment is considered in this article. The IS, which will be called the 'business support information system' (BSIS), is an integrated system for the management and cost-effective optimization of weapons systems (i.e. aircraft, ships, vehicles, etc.). It incorporates all the functions related to technical, commodity and operational support and planning; and its approximately 700 users operate across two of the hierarchical levels of the organization. Budget restrictions, organizational transformation and a prescribed bottom-up implementation approach resulted in a six-year implementation process.

The question now arises: What exactly are the human issues that may arise when implementing an IS within a bureaucratic environment? By unravelling this question, one will gain valuable insight into the scope of the human issues within a bureaucratic context. This can then be utilized for the remainder of the implementation effort as well as for other implementations in similar contexts.

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2 Aim

The aim of this article is to provide an *understanding*, through the analysis of user perceptions and opinions, of the human issues related to the implementation of an IS within a bureaucratic environment.

In the article the focus is not on the hard, technical issues or the organizational issues of the BSIS implementation, nor on providing a list of criteria against which the success of such an implementation can be measured, or even a set of rules to be followed blindly. The aim is to provide insights (i.e. an understanding or a descriptive feeling), based on the BSIS, of those intangible human issues that are relevant to the implementation of an IS within a bureaucratic environment.

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3 Review of literature

Since technology is the product of human action (Orlikowski 1992:409), it can be argued that information systems are implemented by people for people (adapted from Du Plooy 1998:99) and, in order to be of value, they need to be adopted and utilized by people. New technology does not add or subtract anything (Postman 1993:18) – it changes everything in an ecological manner. With information technology not being value-neutral (Du Plooy 1998:24), the implementation of an IS in an organization affects both the people and the organization at large. There is an interplay between the IS, the people and the organization, which Orlikowski (1992) refers to as the 'duality of technology'. The resulting human and organizational issues create serious and often unforeseen problems, and the extent of these is typically quite difficult to predict, as they remain dependent upon the complex reactions of people (Lorenzi and Riley 2003:200). A body of literature addresses the human and organizational issues, of which some typical issues are summarized in Appendix A**.**

As organizations continue to invest heavily in IS, the behaviour of users has become an important issue to consider. According to Avgerou (1998), adoption and use depend on how people perceive the use of technology, the interpretation of the intentions of those who decided to introduce the change in the first place, as well as the personal interests, power relations and cultural norms that exist within the organization. It can therefore be argued that the success of an IS depends largely on the users, their knowledge of the system, their attitude towards it and the degree to which it matches their perception of the processes and actions it is to support (Westelius 1996:67). Many IT applications fail to meet performance expectations owing to a lack of attention given to human issues (Lucas 1975, 1981; Hornby *et al.* 1992; Cleland, Bidanda and Chung 1995; Martinsons and Chong 1999; Au, Ngai and Cheng 2002).

Dahlbom and Mathiassen's (1993:255) contrapuntal notion of a 'mechanistic world with computers and technology' and a 'romantic world with people and organisations' provides a *romantic view* that considers people and how they interpret the change. This means that system implementers have to combine a *mechanistic* understanding of the technology with a *romantic* appreciation of the complexity of human beings and organizations (Dahlbom and Mathiassen 1993:45). Thus *romantics* acknowledge that each person has a unique view of the change, which is in part formed by the context and culture of the organization in which they find themselves.

3.1 Bureaucratic context

People working in organizations such as the military with its rank-based authority generally

find themselves in a strictly regulated environment with relatively little room for improvization (Macredie and Sandom 1999:250). The strong hierarchical structure tends to be *mechanistic* without being sensitive to the *romantic* needs of its employees, and limits the opportunity for change unless imposed by higher authority.

Various researchers have studied IS and its implementation in bureaucratic organizations such as the public sector (Bellamy and Taylor 1996; Hackney and McBride 1995; Nilsson, Joefsson and Ranerup 2001; Walsham and Han 1993), banking (Hornby and Clegg 1992; Liao and Landry 2000), health care (Berg 1999, 2001) and the military (Macredie and Sandom 1999).

Macredie and Sandom (1999), for example, found that despite the influence of a hierarchical organization's culture on the adoption and use of technology, improvizational changes occur when the level of user dissatisfaction is greater than the cultural influence. Walsham and Han (1993:207) conclude that although adoption and use can sometimes be achieved by political pressure, that is imposed by higher authority (Flynn 1992), the users who do not share the expressed goals of the IS can ignore it or even undermine its application. In a bureaucratic environment, decisions are normally taken at higher levels and lower-level personnel (typically at the transactional level) are told what they should and shall do (Auriacombe 2002). Having an IS virtually forced upon them as part of their task could, according to Lucas (1981:8), easily lead to 'alienation and even sabotage' of that system.

3.2 Typical human issues

The implementation of an IS is a type of major organizational change (Hirschheim and Newman 1988:406) and its adoption and use constitute an intervention in the regular activities of the organization (Du Plooy 1998:107). Resistance to this change is natural (Martinsons and Chong 1999:130) and is one of the most problematic issues in technology implementation (Cleland 1995:23). Hirschheim and Newman (1988) provide a theoretical and practical perspective on the complexity of user resistance to IS. Based on how users perceive the implementation and its effect on their goals, they may adopt a number of dysfunctional behaviours (Hirschheim and Newman 1988:398), that is, a tendency to blame the system for other business problems. Users can therefore typically react by, for example, providing inaccurate information or evincing lowered morale. User expectations (Whyte and Bytheway 1996) and user satisfaction (Bailey and Pearson 1983) are often linked to IS utilization and success. It is, however, often argued that user satisfaction alone is not indicative of a successful system, as the possibility exists of having systems that are perceived as being successful, but do not satisfy users (Au *et al.* 2002:451).

Davis (1989) views the matter from a slightly different angle and argues that perceived usefulness (in that people tend to use an application if they believe it will help them to do their job better) and perceived ease of use (effort in using the system) are the two fundamental determinants of user acceptance. The applicability of his model in an environment where utilization is likely to be mandatory is questionable since perceived usefulness could become meaningless. To assist this acceptance process, users will have to be trained in both aspects, namely how to operate the technology and how to do the job better. Martinsons and Chong (1999:130), for example, describe different types of IS training that can be used to help realize the potential benefits and minimize user stress and discomfort.

Different individuals and groups have their own needs, interests and values, which must be met if they are to accept any change. Users therefore need to be involved (Mumford 1990) but, as Hornby and Clegg (1992) rightly argue, participation is not a unitary phenomenon and its extent is strongly influenced by the organizational context within which it is

undertaken. They argue, for example, that a bureaucratic environment tends to promote a 'regulated' type of participation with the higher managerial levels exerting more influence than the lower levels.

It is clear that issues of culture are vital when evaluating the situation surrounding the implementation of an IS and the effect it has on that organization (Hackney and McBride 1995:22). People will form alliances either to resist or promote the IS. Besides the shared values and beliefs of the organization as a whole, there are also the views of the sub-cultures, which could have different perceptions of both the IS and its role. The perception of more than one sub-culture should therefore be considered in an analysis.

3.3 Towards a theoretical model

It therefore seems appropriate to assume that the complex nature of human beings will result in certain human issues arising when change is introduced by implementing an IS in a bureaucratic environment.

Based on the work of the above-mentioned authors, it can be concluded that a typical bureaucratic environment would probably not be conducive to change and would probably favour forced adoption and use. Since the responsibility for decision making traditionally lies with management, the chance of 'open and direct' user participation (Hornby and Clegg 1992:294) is highly unlikely, which could result in a lack of user involvement. On the one hand, this could result in a scenario in which the users, who are accustomed to being dictated to, are excited and satisfied with the situation and the system. On the other hand, it could result in a scenario of low morale and high resistance, which could be exacerbated if the system is not accepted by the users and especially if they are not properly trained.

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4 Research design and methodology

The *romantic* appreciation that people have their own perceptions of a phenomenon (i.e. the implementation of an IS within a bureaucratic environment) necessitated a research design that provides the opportunity to gather and interpret user perceptions in a bureaucratic context. Phenomenological research was chosen since it is a qualitative research method, which, according to Leedy (1997:111), attempts to understand participants' perspectives, perceptions and views of a phenomenon. Field studies were conducted in the form of a questionnaire circulated for the purpose of eliciting user perceptions and opinions of the BSIS implementation process to date.

4.1 Questionnaire design and validation

The *romantic* foundation of this study provided a focus on the users, on how they interacted and changed, and on the processes of implementing and using IS rather than on the IS as such. The different opinions expressed in literature surrounding the formulation of a theoretical *romantic* model were used to develop a set of statements, which focused on users' perceptions of different 'outcomes' of the implementation of an typical IS system. An iterative process of review and refinement resulted in the formulation of a questionnaire consisting of 18 personalized statements, covering four main aspects. The first of these sought to categorize the participating users, based on whether they were working at the command (level 3) or unit (level 4) level of the organization and on whether they were managerial or transactional users. The other three aspects focused on different aspects of human issues, that is the users' attitude towards the system, users' perception of some of the typical human issues (derived from the theoretical model) and finally the users' opinion of

the questionnaire. Statements were formulated in the first person to give users the opportunity to reflect on their personal experience/perception. Likert-type scales were used to express the degree of agreement with the personalized statements.

The questionnaire was validated through a process of discussions and pre-tests, which focused on statement wording and clarity. The pre-tests with six users resulted in a number of minor enhancements and provided the opportunity to verify the validity of the statements. This indicated that the questionnaire was unambiguous and that it was possible to complete it in less than 10 minutes. An explanatory letter, addressed to the participating user, and the questionnaire were printed in A5 format on the two sides of an A4 page.

4.2 Measurement issues

Limited time, logistical limitations and a focus on providing insights rather than generating quantitative results made it impractical and unnecessary to include all the BSIS users. The bureaucratic organization concerned consisted of various sub-cultures or business areas of which three were not only situated locally, but provided for a variety of informative users. Since qualitative sampling is not concerned with representation, but with purposefully selected informants (Creswell 1994:148) through the identification of 'access points (settings where subjects could be more easily reached)' (De Vos 1998:253), a decision was taken to focus only on these three sub-cultures. This approach ensured a population size of 111 users, of whom 89 users completed questionnaires. The remainder of the people were away on course, on leave or on detached duty, which is normal practice for this type of organization. Incompleteness caused the rejection of one of the questionnaires, resulting in 88 usable questionnaires. Although representation was not a prerequisite, the number of usable questionnaires was in line with Krejcie and Morgan's (as cited by Leedy 1997:210–211) suggested sample size of 86 for a population size of 110.

To ensure anonymity, the three sub-culture groups were identified as Groups 1 and 2, both involved with systems management and utilization, and Group 3, a maintenance environment. The users of Groups 1 and 3 were involved with a user group (UG) that met on a weekly basis.

4.3 Data collection

Various questionnaire completion sessions were held with the different groups. Except for two occasions on which the supervisors administered the completion process, the researcher had the opportunity, at the commencement of each session, to explain to the participating users the anonymity of the process, purpose of the study and importance of providing a true and honest reflection of their personal experience. No time limit was imposed, so users could complete the questionnaire at their own pace. Having identified and addressed the areas of uncertainty during the pilot study, it was not necessary to respond to any questions during the completion process.

Although the group sessions had the advantage of exposing the participants to the same stimulus (De Vos 1998:155), the possibility existed that users could have been too embarrassed to ask questions in the group. However, allowing participants to leave once they had handed in their questionnaires (sealed in an envelope and hopefully correctly completed) provided an opportunity for shy users to stay behind to voice their difficulties. Although each participant received his or her own questionnaire, the possibility of mutual influence between the participants could not be totally eliminated. It was also not possible to determine whether or not the participants had read the questions carefully and whether they had responded honestly to the statements.

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5 Results

The 88 usable questionnaire responses were recorded on spreadsheets to enable the researchers to calculate the number of occurrences of each of the agreement options (strongly agree, agree, disagree, strongly disagree and do not know). In this article, the results are presented using the four major aspects that were used to structure the questionnaire.

5.1 User categorization

Table 1 presents a summary of the categorization of the participants. Of the 88 participants, 68 were transactional users who entered data into the system, 57 were using the system in a managerial capacity by drawing up reports, 28 were working at level 3 of the organization and 70 were working at the lower level 4. The fact that 10 (11%) of the participants indicated that they work at both levels 3 and 4 could perhaps be interpreted as meaning that their roles and responsibilities are not clear or that they do not adhere to them. Since this forms part of the organizational issues, it falls outside the scope of this article.

Table 1 Summary of user categories

Users	Group 1	Group 2	Group 3	Total
Managerial	3	12	5	20
Transactional	5	6	20	31
Managerial and transactional	10	12	15	37
Level 3	3	15	0	18
Level 4	11	9	40	60
Levels 3 and 4	4	6	0	10
Number of participants (sample)	**18**	**30**	**40**	**88**
Number of users per group (population)	24	32	55	111
Percentage participation (sample)	75%	93,8%	72,7%	79,3%

5.2 User attitudes

As can be seen from Table 2, the majority of participants (76%) were using the BSIS because it formed an integral part of their daily task, while 15 (17%) of the participants were using it on a voluntary basis because it made their task easier. Although by far in the minority, six (7%) participants were using it because their superiors expected them to do so. As far as their satisfaction with the system was concerned, 67 (76%) of the participants indicated their satisfaction as 6 or higher on a 10-point scale ranging from 1 (extremely dissatisfied) to 10 (extremely satisfied). Thirteen (62%) of the 21 participants who indicated a satisfaction level of 5 or below were Group 2 users and they constituted 43% of the Group 2 sample or 41% of the total population of Group 2. In contrast to this situation, only 17% of the participants of Group 1 and 13% of Group 3 indicated a low level of satisfaction.

Table 2 Summary of user attitudes towards BSIS

Question/Statement	Selectable options	Group 1 (n=18)	Group 2 (n=30)	Group 3 (n=40)	Overall (n=88)

I use BSIS because …	My superiors expect me to use it. I have no choice in this regard	1	2	3	**6**
	It forms an integral part of the execution of my daily task	14	23	30	**67**
	It makes my task easier. I use it on a voluntary basis	3	5	7	**15**
I would rate my overall satisfaction level with BSIS as …	10 (Extremely satisfied)	2		5	**7**
	9	2	2	3	**7**
	8	2	4	9	**15**
	7	5	5	12	**22**
	6	4	6	6	**16**
	5	1	6	1	**8**
	4	1	5	2	**8**
	3	1	2	1	**4**
	2			1	**1**
	1 (Extremely dissatisfied)				

5.3 User perceptions

Table 3 provides a summary of the responses to the statements relating to human issues. As indicated, the statements were classified in five issue groups to summarize the most important characteristics of the statements. It should be noted that these groupings were not indicated on the questionnaire, as it was thought that this might influence the results.

Seventy-five (75%) of the participants felt competent and 76 (86%) empowered to use BSIS, while 76 (86%) were of the opinion that the BSIS was useful in that it had enabled them to do their work better. Sixty-three (72%) perceived the BSIS as being easy to use. While all three groups perceived the BSIS to be useful, Group 2 evinced the least agreement with the system's perceived ease of use. Seventy-eight per cent of Group 1 and 80% of Group 3 agreed that they perceived the system to be easy to use, while only 57% of Group 2 agreed.

Seventy-one (81%) of the participants were motivated to use the BSIS and 72 (82%) of them were willing to promote the system. Again, it was Group 2 whose participants were the least motivated. Only 67% of Group 2's participants agreed that they were motivated, whereas 83% of the participants in Group 1 and 90% in Group 3 were motivated.

Table 3 Summary of user responses to the statements

Issue	**Question/Statements**	**Degree**	**Group 1** (n=18)	**Group 2** (n=30)	**Group 3** (n=40)	**Overall** (n=88)
	I feel competent to use the	Strongly agree	4	8	16	**28**
		Agree	9	18	20	**47**

	BSIS, i.e. I possess the required skills	Disagree	5	4	3	**12**
		Strongly Disagree			1	**1**
		Don't know				
Training	I am empowered to use the BSIS	Strongly agree	5	9	14	**28**
		Agree	11	15	22	**48**
		Disagree	1	5	4	**10**
		Strongly Disagree	1	1		**2**
		Don't know				
Acceptance	Usefulness. I am of the opinion that the BSIS has enabled me to do my job better	Strongly agree	4	5	15	**24**
		Agree	10	21	21	**52**
		Disagree	3	4	2	**9**
		Strongly Disagree	1		1	**2**
		Don't know			1	**1**
	Ease of Use. I perceive the BSIS to be easy to use	Strongly agree	2	4	9	**15**
		Agree	12	13	23	**48**
		Disagree	2	11	7	**20**
		Strongly Disagree	2	2	1	**5**
		Don't know				
Motivation	I am motivated to use the BSIS	Strongly agree	6	3	14	**23**
		Agree	9	17	22	**48**
		Disagree	3	9	4	**16**
		Strongly Disagree		1		**1**
		Don't know				
	I am a willing promoter of the BSIS	Strongly agree	5	4	11	**20**
		Agree	10	17	25	**52**
		Disagree	2	7	4	**13**
		Strongly Disagree		2		**2**
		Don't know	1			**1**
	I am of the opinion that	Strongly agree	12	13	23	**48**
		Agree	6	16	17	**39**

	users should be involved when implementing an IS such as the BSIS	Disagree				
		Strongly Disagree		1		**1**
		Don't know				
Involvement	I am of the opinion that users do not have to be involved when implementing an IS as they must make use of the system as decided on by higher authority	Strongly agree			2	**2**
		Agree	2	2	8	**12**
		Disagree	5	12	11	**28**
		Strongly Disagree	11	15	18	**44**
		Don't know		1	1	**2**
	I think that user involvement was adequate during the implementation of the BSIS	Strongly agree	1	1	2	**4**
		Agree	2	9	15	**26**
		Disagree	6	16	17	**39**
		Strongly Disagree	4	4	5	**13**
		Don't know	5		1	**6**
Resistance	I am of the opinion that that there is considerable resistance to the implementation of the BSIS in my immediate environment	Strongly agree		2	1	**3**
		Agree	13	15	23	**51**
		Disagree	4	10	10	**24**
		Strongly Disagree	1	2	4	**7**
		Don't know		1	2	**3**
	I am of the opinion that there are many cases in which users persist with traditional business practices even though the BSIS has changed the way business is conducted	Strongly agree		2	1	**3**
		Agree	13	18	25	**56**
		Disagree	1	4	11	**16**
		Strongly Disagree				
		Don't know	4	6	3	**13**
	I am of the opinion that there are many cases in which the occurrence of a business problem is blamed on the BSIS	Strongly agree	3	8	5	**16**
		Agree	10	19	24	**53**
		Disagree	2	2	6	**10**
		Strongly Disagree			1	**1**
		Don't know	3	1	4	**8**

Except for one person in Group 2, all the participants were of the opinion that users should be involved when implementing an IS such as the BSIS. Seventy-two (82%) were of the

opinion that users should not just accept a system as decided on by higher authority; but that they should be involved in the implementation, while 14 (16%) felt differently. The biggest support for this latter perception came from Group 3 with 25% of its participants supporting the idea of using a system as decided on by higher authority. Fifty-two (59%) of all the participants felt that user involvement was inadequate during implementation, while 30 (34%) felt that it was adequate and 6 (7%) did not know.

Fifty-four (61%) of the participants were of the opinion that there was considerable resistance to the implementation of the BSIS in their immediate environments, whereas 31 (35%) perceived the situation to be the opposite. This resistance was perceived by 13 (72%) of the participants in Group 1, and 17 (57%) and 24 (60%) of the participants in Group 2 and Group 3 respectively. Despite 13 (15%) of the participants not knowing whether users persisted with traditional business practices even though the BSIS has changed the way business was conducted, 59 (67%) agreed that many cases existed and 16 (18%) perceived the opposite. Sixty-nine (78%) of the participants were of the opinion that business problems were blamed on the BSIS. This was the situation in all three groups, with 13 (72%) of the participants in Group 1, 27 (90%) in Group 2 and 29 (73%) in Group 3 indicating their agreement with the statement. All eight (9%) of the participants who did not know were from the transactional users' group, with one also using it in a managerial capacity.

5.4 Users' opinion of the questionnaire

All the users indicated that they felt free to give their opinions, while 78 (89%) felt that their opinions would be used in a meaningful way to enhance the overall process. This overwhelmingly supportive perception indicates that the process was perceived to be free and fair. It increased the chance of having the true and honest opinions and perceptions of the participants available for interpretation.

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6 Discussion

The results showed that when an IS was implemented within a bureaucratic environment, resistance to implementation, and hence to change, seemed to be a reality. In fact, it seemed to be the most significant issue (in a negative sense) experienced by the participants. With 61% of the participants in agreement that considerable resistance existed, 67% that users persisted with traditional business practices and 78% that the occurrence of business problems was blamed on the BSIS, it became clear that at least some of the users had not adopted the system. However, the 81% of the participants who were motivated to use the system and the 82% who were willing promoters indicated the presence of other issues in the adoption process. (Please note that although there is a variety of human, organizational and technical issues that could be involved, the focus in this article is only on human issues.)

The issue that most participants seemed to agree upon was that users should be involved when implementing an IS. Despite the fact that 99% of the participants indicated that users should be involved and 82% that users cannot simply have a system forced upon them by higher authority, only 34% agreed that users were adequately involved during the implementation to date. Two interpretations can perhaps be made of these findings. Users were either not sufficiently involved and thus not given the opportunity to be part of the process and to adopt the system during the early phases of implementation, or it might have been the wrong form of participation for the specific organizational context. Either way, the results indicate a *mechanistic* approach to implementing an IS and then coping with its human implications. The UG that was initiated during the implementation of the BSIS within the business areas of Groups 1 and 3 provided additional opportunity for those users to be

involved and to participate in the implementation process. This additional opportunity might perhaps have been the reason why only 56% of the participants of Group 1 and 55% of those from Group 3 indicated inadequate involvement, whereas 67% of the participants in Group 2 perceived the involvement to be inadequate.

The 14 participants who agreed that users do not have to be involved because they must make use of the system as decided on by higher authority, were all using the system in a transactional capacity at level 4, except for one who was working at level 3. This perception is supportive and typical of an environment in which decisions are taken at higher levels and the lower level of staff are told what they shall and should do (Auriacombe 2002).

The 43% of participants in Group 2 who indicated that they do not perceive the BSIS to be easy to use, seemed to offer further proof that the additional support provided by the UG helped to address the usability of the system in that only 22% of participants in Group 1 and 20% in Group 3 disagreed. Perceived ease of use and perceived usefulness (to which the majority of all three groups agreed) are two subjective determinants of user acceptance (Davis 1989). Seventy-six per cent of the 17 participants who disagreed with either of the two issues relating to training (that were tested) perceived the system not to be useful or easy to use. It can therefore be argued that user training had a significant influence on the extent to which a system is accepted and used. Of the 21 participants who indicated that they were not motivated or willing promoters, 10 (48%) also indicated that they did not possess the required skills (i.e. were not competent) to use the BSIS or that they were not empowered to do so. Fifteen (71%) of these 21 'unmotivated' participants responded in the negative to either of the two acceptance issues. Therefore, although the majority of the participants felt competent and empowered to use BSIS, the 17 (19%) who did not share this perception still raised a flag of concern. Eight (47%) of these 17 participants indicated a satisfaction level of five or lower. These findings could be ascribed either to insufficient training that was perhaps only provided after the system was in operation, or to training practices that train users on how to operate the technology instead of how to do the job better. The results once again indicated a typically *mechanistic* approach.

User support and involvement through the UG also seemed to keep the users motivated and willing promoters. Only 67% of participants in Group 2 were motivated to use the BSIS whereas 83% or the participants in Group 1 and 90% in Group 3 were motivated.

The relatively low number of participants (15 or 17%) who indicated voluntary usage, could be interpreted as meaning that the BSIS was mainly used on a mandatory basis; either because it formed an integral part of their daily task (76%) or because their superiors expected them to do so (7%). Of the six who perceived system usage to be mandatory, five considered their training to be inadequate, all six found it difficult to accept the system in that they disagree with its perceived usefulness and/or its perceived ease of use and were therefore not motivated to use the system or to promote it. Their low satisfaction level of four and below supported this rather negative attitude. It is therefore not surprising to see that they all agreed (the majority even strongly agreed) that users should be involved and that the users had not been sufficiently involved with the implementation of the BSIS. These results are slightly different from what one would expect of an environment where people are used to being told what to do, and is proof of the complexity of people and the importance of including a *romantic* appreciation of this complexity in the implementation process. No concrete finding emerged from the results regarding the value of perceived usefulness, which Davis (1989) found to be more strongly linked to usage than ease of use when system usage is mandatory.

Although an investigation into the impact of an UG in a bureaucratic environment was not the aim of this research, the results seemed to indicate that it provided an effective way of

involving the users in improving the usability of a system after implementation and thereby introducing a *romantic* approach into a traditionally *mechanistic* environment.

Finally, a number of additional research possibilities presented themselves for further investigation, namely the extent of the organizational and technical issues that were involved and the influence thereof on the form of user participation. An investigation into the rest of the organization and a comparison with other bureaucratic and non-bureaucratic organizations would also be significant.

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7 Conclusion

This research considered user perceptions of the implementation of an IS within a bureaucratic environment in order to provide an understanding of the human issues involved. It was found that various human issues were involved and that the likelihood and form thereof depended upon the individual.

The results showed that this bureaucratic organization had been perceived to follow a *mechanistic* approach to IS implementation without being sensitive to the *romantic* needs of its users. Although the participants seemed to be satisfied with the system in general, and despite the users' traditional exposure to being told what to do, they were not satisfied with the situation. User resistance, involvement, training, acceptance and motivation were identified as human issues that were involved.

User resistance and a lack of user involvement seemed to be the most dominant issues involved, but also the most challenging because of the tendency in the organization's culture towards mandatory adoption and use, and its resistance to open and direct participation. User training also had a significant influence on the acceptance of the system but, although user involvement and training could help to overcome resistance, a favourable environment would be required before training could help to facilitate the change process. It was evident that user support and involvement through the UG provided an opportunity to keep the users motivated and satisfied.

This study was based on a single implementation within a single organization and therefore involved a relatively limited sample. Nonetheless, the results meet the demands of qualitative research in providing an understanding within a particular context. There is no intention to generalize the results; the limited sample and subjective nature of the participants' perceptions and opinions are acknowledged. The study confirms the increasing importance of human issues within a bureaucratic context and the need to explicitly address them in order to ensure proper adoption and use of a BSIS.

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APPENDIX A

Summary of typical human and organizational issues as identified in the literature

The categorization is adopted from Doherty and King (1998).

Issue	**Source**
Organizational contribution:	
The extent to which the IS is successfully integrated with business goals and business needs, that is:	Clegg *et al*. (1997:859)
• Alignment with the organization and IS strategy.	Doherty and King (1998:109)
• Did management set and prioritize benefits to be achieved?	Doherty and King (1998:109)
• Were you able to relate to the benefits that were to be achieved?	Southon *et al*. (1999:40)
• Were the benefits quantifiable?	Southon *et al*. (1999:40)
• Were the organization's future needs considered?	Doherty and King (1998:109)
Role of (top) management	Doherty and King (1998:109)
• Degree of interest, enthusiasm, support or participation of any management level above your level towards the BSIS	Bailey and Pearson (1983:539)
• Level of understanding on the part of senior managers in the area of the IS (new technology) and its impact (especially in terms of the human and organizational (i.e. soft) issues	Clegg *et al*. (1997:861); Lucas (1981:12)
• Availability of resources?	Lucas (1981:99
• Type of behaviour that management encouraged and rewarded?	Lucas (1981:99)
Pre-implementation environment. (The extent to which the pre-implementation environment was impacted on by the implementation.)	Southon *et al*. (1999:39)
• Did your environment gain/loose functionality with the implementation of the IS?	–
Organizational transformation	
Organizational alignment:	
Impact on organizational culture (i.e. shared values and beliefs expressed as the formal and unwritten	Doherty and King (1998:109)

rules and norms of behaviour)	
• Impact on sub-cultures within the organization	Hackney and McBride (1995:22)
Impact on organizational structures and processes (e.g. changes to hierarchy, degree of specialization within work units, degree of integration between units, new work relationships, etc.	Doherty and King (1998:109); Lucas (1975:4); Clegg *et al*. (1997:859); Hornby *et al.* (1992:165)
Impact on the distribution of power (politics) among hierarchical levels, organizational subunits and individuals because of new interdependencies	Doherty and King (1998:109); Lucas (1981:9); Lucas (1975:4)
Human issues:	
User training requirements (Are users only trained on how to use/operate the IS, or are they trained on how to do the job better?)	Clegg *et al*. (1997:860); Lucas (1981:9)
• Was training provided before or after the IS was in operation?	
• Were the training plans linked to the new job designs and working practices?	
• Were sufficient resources (personnel, time and money) spent on education and training, or was it rushed in order to implement the IS?	
Wider management and user education	Lucas (1975:2,4)
• Do users understand the use of the information provided by the IS?	
Mutual understanding between users and analysts (IS/IT personnel)	Hornby *et al.* (1992:165)
Impact on user's satisfaction, motivation and performance	Clegg *et al*. (1997:859); Doherty and King (1998:105); Lucas (1981:12)
Reward systems	Cleland *et al*. (1995:23)
Ergonomic impact and health and safety issues	Clegg *et al*. (1997:860)
Re-design of tasks to suit the IS (impact on the way in which work is organized and upon individual job designs)	Clegg *et al*. (1997:859); Lucas (1975:4)
Level of user involvement and influence	Clegg *et al*. (1997:860); Lucas (1981:99)
• Were users observed and interviewed to capture their needs?	Hornby *et al*. (1992:165)
• Were users involved in acceptance testing?	Clegg *et al*. (1997:860)
• Were users provided sufficient opportunity/encouraged to 'influence' the design/ implementation of the IS?	Clegg *et al*. (1997:860)
• If not, what do you consider to be the barriers to successful user participation?	Clegg *et al*. (1997:861)
• Do you consider that the IS meets with your (as a user) expectations? To what extent does it or does it not?	Clegg *et al*. (1997:861)
Usability of the IS (user-friendliness)	Clegg *et al*. (1997:859)
User support	Hornby *et al*. (1992:165)
Communication	
• Did a clear set of benefits exist?	Southon *et al*. (1999:34)
• Has effective feedback been provided on the	

progress and problem areas?	
Resistance to change. Accompaniment of change management (i.e. involvement, communication and training)	Hirschheim and Newman (1988)
• To what extent was the organization and its members assisted in passing from the old way of doing things to the new way of doing things?	Lucas (1981:9)
Integration issues:	
Interfaces to existing systems	Doherty and King, (1998:109)
Deciding who has access to what information on the system	Hornby *et al*. (1992:165)
Transitional issues:	
Level of organizational disruption	Doherty and King, (1998:109)
Timing of implementation (i.e. interaction of the timing of the implementation of the IS with the timing of other planned changes within the organization)	Doherty and King, (1998:109)

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