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2005

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ABSTRACT

Systems development endeavors usually occur in highly complex, politicized environments in which diverging interests of stakeholders result in a variety of conflicts. Therefore, conflict management has been an important focus of research in information requirements determination (IRD). However, research has failed to recognize that organizational politics and pressures on the participants might lead to an illusion of agreement among participants. The illusion of agreement phenomenon subsumes a wide range of dysfunctional group behaviors that lead to a superficial illusion of conformity among the members of the group. Two specific variants of this illusion are groupthink and the Abilene Paradox (AP). While the problem of groupthink has received some attention in the IRD literature, the concept of AP has not been considered. AP refers to the tendency of each group member to believe that every member wants to pursue a particular course of action, which leads everyone to agree publicly while disagreeing privately. This study empirically demonstrates the role of AP during a group requirements elicitation process (JAD). Implications of the findings and prescriptive guidelines are discussed.

Keywords

Abilene paradox, illusion of agreement, group requirements elicitation, JAD, group conformity.

INTRODUCTION

Four reasonable and sensible people agreed to take a 106-mile trip during a dust storm on a scorching 104-degree West Texas day to eat unpalatable food at a hole-in-the-wall cafeteria in Abilene when none of them had really wanted to go (Harvey 1977). This story inspired the identification of the Abilene Paradox, a tendency of groups to decide to take actions that contradict what the individual members really want to do (Sauser 1988). The present paper investigates how the Abilene Paradox manifests itself during the requirements elicitation phase of the systems development process.

Major systems development endeavors usually occur in highly complex, politicized environments involving numerous interested parties. Because of the occurrence of conflict in such environments, research on requirements gathering in this context has focused primarily on conflict management in general and more specifically on the role of facilitators in achieving goal congruence and fostering agreement among the conflicting parties. However, research to this point has failed to recognize that organizational politics and the pressure on participants might lead to an illusion of agreement among the participants. The illusion of agreement phenomenon subsumes a wide range of dysfunctional group behaviors that lead to a superficial illusion of conformity among the members of the group. Two specific variants of this illusion are groupthink and the Abilene Paradox. The problem of illusion of agreement has been addressed in the information requirements determination (IRD) literature only by examining the problem of groupthink. The other variant, the Abilene Paradox, has not been discussed in the IRD literature. The Abilene Paradox refers to the tendency of individual group members to believe that the other group members want to pursue a particular course of action; this illusion causes everyone to agree and thus undertake that action in contradiction to what each person individually wants and believes (Harvey 1977). Figure 3 illustrates the stages involved in boarding the bus to Abilene.

In IRD, the Abilene Paradox is hypothesized to arise when agreement or consensus in the requirements elicitation process masks individual differences and disagreements regarding the requirements of the proposed system and thus results in

inaccurate and incomplete requirements. Therefore, this study investigates the existence of the Abilene Paradox during requirements gathering processes such as JAD sessions that involve groups of users. Recognizing the potential of the paradox to undermine the requirements gathering process, this study also provides prescriptive guidelines that analysts can adopt to identify and circumvent the illusion of agreement triggered by the Abilene Paradox.

The rest of the paper is organized as follows. The next section provides background and describes our theoretical argument as to why IRD participants become susceptible to the Abilene Paradox. We then provide a conceptual framework for the research and develop hypotheses. Next, the methodology for the study is described, followed by the results of the data collection. We conclude with implications for researchers and practitioners.

BACKGROUND

Information Requirements Determination

Information requirements determination refers to the set of activities performed by a systems analyst when assessing the functional, non-functional, and technical requirements for a proposed system (Browne & Ramesh, 2002). It also involves collecting relevant information about the current business processes, data needs, goals of the organization, goals of the system, and the behaviors of the users (Yadav et al. 1988). Errors made at the IRD stage generally are expensive to rectify, because such errors have rippling effects on the subsequent stages of the systems development process (Browne and Rogich, 2001; Ramamoorthy and So 1978). Therefore, the information gathering process is critical to the success of the entire systems development effort (Alvarez 2002; Browne and Rogich 2001).

Traditionally, the requirements determination process has been conducted by systems analysts through a series of one-on-one interviews with users. However, problems such as time constraints, conflicting views, and requirements integration issues led to the shift in analyst preferences toward group requirements elicitation techniques such as joint application development (JAD) (Liou and Chen 1993). JAD is a facilitated group technique that is used in IRD to encourage team rapport, reduce communication barriers, and achieve synergy by leveraging the combined knowledge of participants (Duggan and Thachenkary 2004). Extensive research on JAD and other group requirements elicitation techniques has examined a variety of issues relating to dysfunctional group dynamics (e.g., Duggan and Thachenkary 2004; Liou and Chen 1993). This research has recognized that group conflicts and their management during the systems development process in general and during IRD in particular is crucial to the success of the systems development endeavor (Davidson 2002; Glasser 1981; Smith and McKeen 1992).

Requirements determination has traditionally focused on "…managing the convergence of stakeholder interests toward agreement …" (Jarke 1998, p. 41). This focus of IS research on conflicts and conflict management (Robey et al. 1989; Markus 1983; Glasser 1981) with the objective to achieve agreement has diverted researchers' attention away from a related but fundamentally different problem: the illusion of agreement. This problem provides compelling motivation for the current study.

As a symbol of agreement concerning the requirements of the proposed system, it is common for analysts and users to "sign off" on a requirements document. When the users sign off, however, does it really mean that the users have overcome the conflicts amongst themselves and with the analysts and have agreed to the set of requirements, or is it merely an illusion of agreement that has been created? The occurrences of such illusions are common for a variety of reasons. In the systems development context, users may provide requirements contradictory to their beliefs merely to avoid conflicts. Such agreements, however, mask underlying problems; such "problems can be serious and the consequences catastrophic for the organization and the people involved" (Harvey 1974, p. 63). Inability to manage such an illusion of agreement could be a major source of the failure of requirements determination process and has not been given due attention in the information systems literature.

Illusion of Agreement and the Abilene Paradox

Illusion of agreement subsumes a wide range of dysfunctional group behaviors that lead to a superficial delusion of conformity among the members of the group. Two specific variants of this illusion are groupthink and the Abilene Paradox. The two variants are distinguishable and indeed need to be distinguished. They have dramatically dissimilar consequences for group cohesion, they involve different levels of analyses, and, from a practical standpoint, each condition requires custom-tailored diagnostic strategies. The differences are highlighted in Figure 2.

While under the influence of groupthink, members of the group are highly euphoric, enjoying high morale and a heightened sense of efficiency and are often not conscious of the dysfunctional decision-making process which leads them to irrationally avoid examination of alternative courses of action not put forward by the group (Janis 1982). However, when being subject to the Abilene Paradox, members of the group want to do one thing but willingly, consciously, and in "despair" do the opposite (Kanter 2004; Wilson and Harrison 2001). Therefore, groupthink "makes people feel good about bad public decisions, while Abilene [Paradox] makes people feel bad about good private decisions withheld from the group" (Taras 1991, p. 404).

The abundance of research on groupthink has brought increased awareness to practitioners, who consciously take measures to address this issue when dealing with highly cohesive groups. Systems analysts are frequently warned to avoid groupthink during the requirements gathering process (Browne and Ramesh 2002). However, there is no indication in either the research or practitioner literature that analysts ever receive guidance regarding the possible influences of the Abilene Paradox. This study contends that in the context of systems development in general and requirements gathering in particular it is more likely that the Abilene Paradox is more likely to be a problem than groupthink for the following reasons:

1. Information requirements gathering occurs in a highly politicized environment (Markus 1983) in which group cohesion, a necessary condition for groupthink, is often absent. The organizational politics and group pressures force users to conform to the favored views of the group. For example, as highlighted in the case study conducted by Davidson (2002), potential users of a proposed system often provide information contradictory to their own beliefs simply to satisfy the needs and ego of their superiors or informal group leaders to avoid personal negative consequences.

2. The information requirements gathering process often brings together stakeholders from different functional departments, who are usually not familiar with each other (Robey et al. 1989). Further, members of such groups tend to have divergent opinions, interests, and goals (Alvarez 2002; Smith and McKeen 1992). The transient nature of such groups (Davidson 2002) with diverging interests prevents group cohesion from occurring. Since group cohesion is essential for groupthink to occur, the IRD environment is more conducive to the Abilene Paradox than to groupthink.

3. The IS literature has repeatedly emphasized that the aftermath of systems failure often takes the form of conflicts among different parties, shirking of responsibilities, and acts of finger pointing. This characteristic is similar to the groups that fall prey to the Abilene Paradox rather than groupthink, in which the members of the group remain cohesive even after the repercussions of the faulty decisions come to light (Taras 1991).

In the context of requirements gathering, analysts rely heavily on users for information, guidance, and support. Though soliciting such assistance is a natural phenomenon during systems development, it becomes problematic when the analyst seeks a "consensus opinion" from the user group (Harvey et al. 2004). Such practices of analysts make the requirements determination process vulnerable to the Abilene Paradox. Therefore, this study addresses a gap in the IS literature by investigating the Abilene Paradox as a potential cause for problems in IRD.

Characteristics of the Abilene Paradox as Applied to IRD

Drawing from literature on the Abilene Paradox and requirements gathering, this section describes two reasons that the parties involved in the IRD process may fall victim to the Abilene Paradox. Three other reasons – real risk, fear of separation, and reversal of risk and certainty – that could cause Abilene paradox have not been discussed in this section due to space constraints (refer to Harvey (1974) for a detail discussion of the same).

Action Anxiety

Action anxiety refers to the intense apprehensions that are created as people think about acting in accordance with what they believe needs to be done (Kanter 2004). Though the process of requirements gathering is conducted by systems analysts, a huge responsibility is placed on the users, who possess valuable information essential for the development of the proposed system. Often these systems serve the needs of users with diverse functional requirements and involve users from varying levels of authority. While stating the requirements, users may acquiesce simply to avoid expending time and effort on explaining their point of view, which can be otherwise used productively in doing their assigned tasks or to circumvent any kind of confrontation with the analysts or peers and superiors in the organization who might not share the same beliefs.

Negative Fantasies

Negative fantasies refer to pessimistic perceptions that individuals have about what will happen as a consequence of their acting in accordance with their understanding of what is sensible (Gini 1992). While action anxiety refers to anxiety arising

out of the need to take an action, negative fantasies refer to the expectation of negative consequences that might result from any such action. During requirements gathering, users may negatively fantasize that their opinions might be ridiculed by their peers or the analyst. Such fantasies will be greater for individuals in the lower levels of the organizational hierarchy who often do not have much authority but who possess information critical to the success of the proposed system. Similar thoughts could arise in the minds of individuals with low self-esteem or individuals with low computer self-efficacy. Further, a user may fear that his suggestions might result in a major failure and consequently lead every one to blame him for the problems that ensue.

Support from Group Members

Research on group decision making has shown that conformity is typically greatest when a person believes that he or she is the only person deviating from the normative group position. Asch (1955) found that conformity with the majority group opinion is substantially reduced when subjects perceive that at least one other group member is also willing to deviate from the group norm.

HYPOTHESES

We examined the two characteristics of the Abilene Paradox – action anxiety (AA) and negative fantasy (NF) – in a requirements determination setting. Based on the literature on AA and NF discussed in the previous section, the following hypotheses (stated in the alternative form) are proposed:

> H1: In the absence of confederate support, the responses of users with action anxiety and the responses of users with negative fantasies will not be different (participants in both conditions will not reveal their true beliefs).

> H2: In the absence of confederate support, the responses of users with action anxiety will differ from the responses of users in the control condition (participants in the AA condition will be less likely to reveal their true beliefs when compared to participants in the control condition).

> H3: In the absence of confederate support, the responses of users with negative fantasies will differ from the responses of users in the control condition (participants in the NF condition will not reveal their true beliefs when compared to participants in the control condition).

Since the introduction of support from one confederate substantially reduced the rate of conformance with a faulty majority opinion in the experiments conducted by Asch (1955), this study explores the possibility of a similar impact in the context of AP. In conditions in which AA is introduced, it is expected that more participants will express their true beliefs because support from at least one group member can be expected to reduce a participant's anxieties. However, in case of NF, despite confederate support, no such shift in responses is expected because the participant will still strive for the majority's approval. In the case of the control group, results similar to that of Asch (1955) are expected. Therefore, introduction of confederate support can be expected to improve the quality of requirements more in case of control and AA conditions than in NF.

> H4: In the presence of support from one confederate, the responses of users with action anxiety and the responses of users with negative fantasies will be significantly different (even with confederate support, participants in the NF condition will not reveal their true beliefs when compared to participants in the AA condition).

> H5: In the presence of support from one confederate, the responses of users with action anxiety and the responses of users in the control condition will be significantly different (even with confederate support, participants in the AA condition will not reveal their true beliefs when compared to participants in the control condition).

> H6: In the presence of support from one confederate, the responses of users with negative fantasies and the responses of users in the control condition will be significantly different (even with confederate support, participants in the NF condition will not reveal their true beliefs when compared to participants in the control condition).

> H7: Responses of users with action anxiety with no confederate support and the responses of users with action anxiety and confederate support will be significantly different (participants in the confederate support condition will reveal their true beliefs when compared to participants in the no support condition).

> H8: Responses of users with negative fantasies with no confederate support and the responses of users with negative fantasies and confederate support will not be significantly different.

H9: Responses of users in the control condition with no confederate support and the responses of users in the control condition with confederate support will be significantly different (participants in the confederate support condition will reveal their true beliefs when compared to participants in the no support condition).
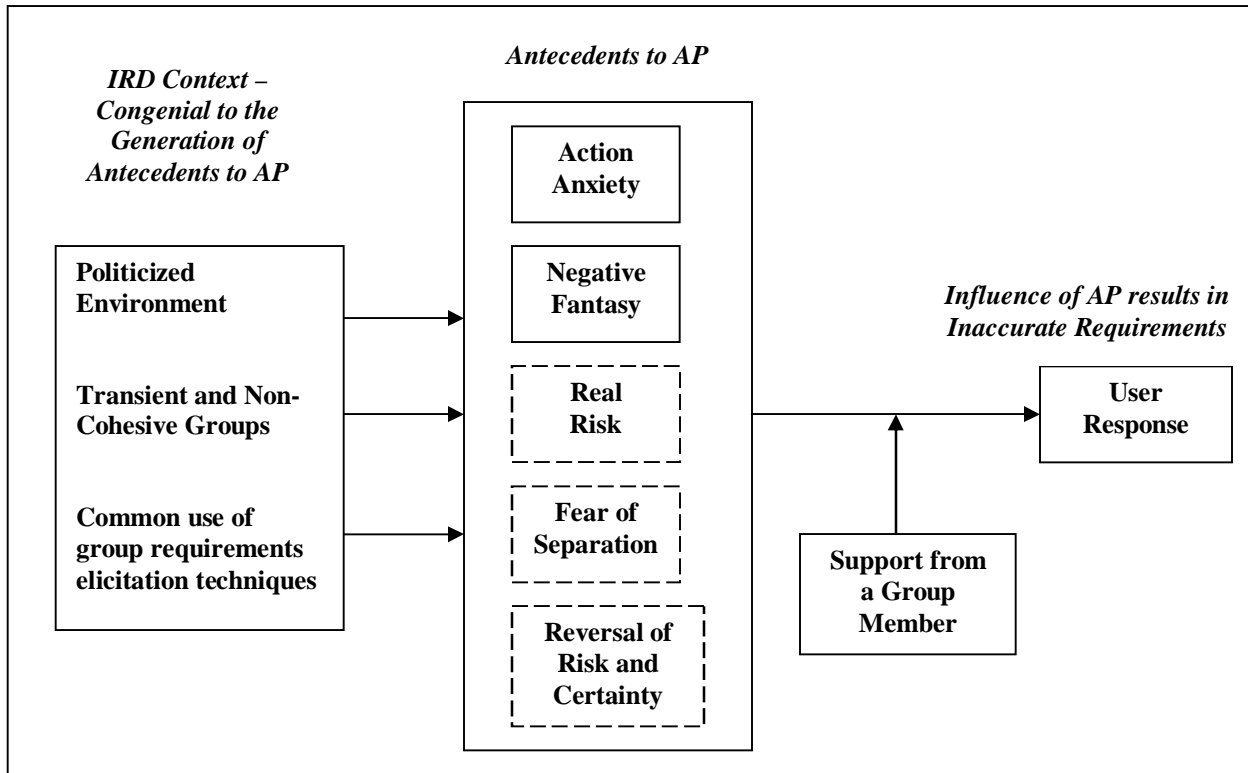

Figure 1. Conceptual framework explicating the effects of Abilene Paradox on the quality of requirements gathered during IRD

METHODOLOGY

To validate the paradox in the context of requirements elicitation, an empirical study was performed. Participants were 64 students in an undergraduate course at the college of business at a research university (24 in the control condition and 20 in each of two treatment conditions). Participants received extra credit in the course in exchange for their participation. Participants were informed that they were participating in a requirements elicitation task for building a retail website. The experiment was conducted in three phases.

Phase I: During Phase I subjects' preferences regarding certain website features were gathered using a survey containing a list of website features. The subjects indicated their preferences for features being on the website using a seven point Likert scale (with 1 indicating Strongly Disagree and 7 indicating Strongly Agree). At the end of Phase I, the experimenters determined website features for which subjects had expressed strongly differing views (e.g., dynamic home page, back ground music, welcome messages in Flash, etc.). That is, many subjects had rated these features as "7" on the Likert scale and many subjects had rated the same features as "1" on the scale. These debatable features were used for discussion during Phase II of the experiment.

Phase II: One week after gathering subjects' preferences, subjects were invited for a JAD session for further discussion of the requirements for the retail website. Every JAD session involved an analyst and five participants, of which four participants were confederates employed for the purposes of this experiment (confederates were paid for their participation). The confederates were trained prior to their participation in the experiment. During every session four debatable website features from Phase I were discussed. These debatable features were customized for each participant (i.e., the features were ones for which this participant had taken a strong position and which solicited ratings of predominantly 1s and 7s from the study participants as a whole). For the first two features, all the confederates expressed opinions opposite to the preferences of the subject. For the last two features, one of the confederates expressed an opinion similar to that of the participant. The participant was seated at the end of the table and thus heard all the opinions before providing his or her own opinion. Once all the members of the group expressed their opinions on any given feature, the group was asked to make a decision regarding

whether the feature should be included or excluded from the website. The subject's opinion and final decision were noted to examine any shifts in preferences from his opinion on the survey.

At the beginning of Phase II, the subject was randomly assigned to one of the three conditions – control, action anxiety, or negative fantasy. The only difference in the experimental procedure administered to the three groups was in the initial instructions given to the participants. Subjects in the action anxiety group were told that in some cases it is possible that one of the group members might hold an opinion different from that of the others in the group. Since such unique opinions are essential for gathering an accurate understanding of user requirements and critical for the systems development process, the subject with the differing opinion will be asked to write a page on why he holds such an opinion and why he thinks that others' reasoning might be flawed. It was expected that requiring subjects to write a one-page explanation would induce action anxiety. Subjects in the negative fantasy condition were told that they would automatically receive five extra credit points for their participation. They were further told that they could receive up to five more points based on peer evaluations (aimed at evaluating each other's contribution during the session) provided by other members of the group at the end of the session. Such peer evaluations were introduced to induce negative fantasies in the minds of the participants while participating in the JAD session. Subject in this treatment condition might perceive that expressing views against the majority opinion could result in loss of some or all of the five points to be assigned by other group members. Subjects in the control group received no special instructions.

Phase III: At the end of Phase II, the participants of the JAD session were each asked to go to different rooms for a follow-up interview with another analyst. In reality only the subject was interviewed. The interview was aimed at eliciting detailed information regarding the subject's emotions, perceptions, and thought processes while participating in the JAD session. At the end of the interview, subjects filled out a survey aimed at measuring personality traits (extraversion, agreeableness, conscientiousness, emotional stability, intellect, and imagination), self-esteem level, and some demographic information.

Each phase lasted about 15–20 minutes. All the sessions were tape-recorded and later transcribed and coded for data analyses. Every subject's response was coded by comparing his initial response gathered on the survey during Phase I with his response during the JAD session in Phase II. If the subject's initial responses matched with his responses during Phase II, the subject was given a score of "0." If the responses were different, the subject was graded as "1." Every subject's responses for the first two discussion items (with no confederate support) and for the last two discussion items (with one confederate support) were aggregated for the purposes of data analysis.

RESULTS

A one-way analysis of variance (ANOVA) was employed to compare the effect of action anxiety, negative fantasy, and the absence of any manipulation on the requirements provided by the subjects during the JAD sessions. Further, between-group comparisons were made to understand the effect of providing support from one confederate on the subjects' responses in the three conditions. Finally, within-group comparisons were made to understand the effect of providing support from one confederate on the subjects' responses. Results of the analysis have been summarized in tables 1-4. (Note: NF – Negative fantasy; AA – Action Anxiety; FTR – Fail to Reject.)

Condition	No Support from Confederates	Support from One Confederate
AA	1.6	0.85
NF	1.55	1.2
Control	1.125	0.67

Table 1. Mean Values for the Control and Treatment Groups (Higher numbers reflect greater influence of the paradox)

Hypothesis	F - Value	P - Value	Support for Hypothesis	Discussion
H1 – NF vs. AA	0.05	0.82	Supported (FTR)	As hypothesized, there is no significant difference between the responses of the subjects in the NF and AA groups. That is, in the absence of any support from other members of the group, NF and AA trigger the paradox in group settings equally.
H2 – AA vs. Control	4.41	0.04	Supported	As hypothesized, there is a significant difference between the responses of the subjects in the AA and control groups. Although the Abilene Paradox does not manifest itself in all group settings, when an antecedent such as AA is present the impact is significant.
H3 – NF vs. Control	3.51	0.07	Supported at α = 0.10	As hypothesized, there is a significant difference between the responses of the subjects in the NF and control groups, i.e., the presence of NF triggers AP while its absence does not.

Table 2. No Support from Confederates – Between-Subject Comparisons

Hypothesis	F - Value	P - Value	Support for Hypothesis	Discussion
H4 – NF vs. AA	2.62	0.1	Supported at α = 0.10	There is a significant difference between the responses of the subjects in the NF and AA conditions when one of the confederates expressed support for the subject's opinion. The direction of the means suggest that support from a confederate is sufficient to mitigate the effects of AA but is insufficient to overcome the effects of NF.
H5 – AA vs. Control	0.7	0.4	Not Supported	There is no significant difference between the responses of the subjects belonging to the AA and control conditions when one of the confederates expressed support for the subject's opinion. Such a result suggests that providing some kind of support can mitigate the effects of AA.
H6 – NF vs. Control	5.78	0.02	Supported	There is a significant difference between the responses of the subjects in the NF and control conditions when one of the confederates expressed support for the subject's opinion. This implies that even with some kind of support, it will be hard to overcome the effects of NF.

Table 3. Support from One Confederate – Between-Subject Comparisons

Hypothesis	F - Value	P - Value	Support for Hypothesis	Discussion
H7 – AA	12.31	0.001	Supported	The within-subject comparison revealed that providing support from one confederate makes a significant difference to the responses of the subject, i.e., providing support induces the subject to express his true beliefs.
H8 – NF	2.56	0.11	Supported (FTR)	Providing confederate support did not result in any significant difference in the subject's responses, i.e., confederate support is not sufficient to overcome NF.
H9 – Control	4.41	0.04	Supported	Providing confederate support induced the subject to reveal his or her true beliefs.

Table 4. No Support from Confederates vs. Support from One Confederate – Within-Subject Comparison

IMPLICATIONS

Researchers and practitioners in the area of IRD have considered JAD as a panacea for gathering complete and accurate requirements from users (Liou and Chen 1993). Though some research has examined group processes and their associated problems (especially groupthink) in the context of group requirements elicitation processes (e.g., Borovits et al. 1990; Newman and Robey 1993), the Abilene Paradox has received no attention to this point. The present paper has demonstrated empirically that individuals will agree with other group members even when such agreement conflicts with their own prior beliefs, consistent with predictions based on the Abilene Paradox. The results of the study, though found in a laboratory setting, are of great significance since the magnitude of the manipulated variables (anxiety avoidance and negative fantasies) and other variables not examined in the study are often found to be more intense and complex in organizational settings (Harvey et al. 2004; Wilson 2001). Further research can examine the other variables as causal influences on the Abilene Paradox, and can look at all the variables under different settings and conditions.

JAD has become an increasingly common practice in gathering requirements, and it is therefore important for systems analysts to be aware of the limitations of group requirement elicitation processes. Analysts need to monitor such sessions for indications of dysfunctional group dynamics. In doing so, they need to recognize the distinctive role of the Abilene Paradox in hindering quality requirements elicitation. As we have demonstrated, people under common group circumstances will not reveal their true beliefs about IS features. As these same people may ultimately have to use systems that contain these features, such situations are fraught with threats to system success.

Given the weaknesses of consensual methods of decision making that affect the IRD process, analysts should consider the introduction of "programmed-conflict" via methods such as devil's advocacy, dialectical inquiry, fast-checkers, second-guessers, and GAD files (Browne and Ramesh 2002; Kanter 2004; Taras 1991). Though such methods may initially be unpopular with group members, they have been demonstrated to produce better group decisions in organizational development circles (Schweiger, Sandberg, and Ragan 1989) and thus can be employed by analysts as a strategy to break the illusion of agreement.

Furthermore, extant literature in organizational development has identified that when the virulence of the forces that are silencing dissent can be reduced, individuals are willing to voice dissent (Harvey 1977; Taras 1991). Therefore, the analyst could potentially address the problem of the Abilene Paradox by employing techniques such as anonymous e-JAD, in which aspects of the joint application development are conducted anonymously online. This technique could alleviate the threats perceived by group members while still reaping many of the benefits of the group requirements elicitation process.

APPENDIX

	Abilene Paradox	Groupthink
Nature of the group	A sum of fragmented individuals	A single cohesive organism
Individual's condition at the time of group decision making	Dilemma between expressing their view vs. going along with misperceived collective reality	Preoccupied by group illusions such as unanimity and hence no dilemma
Individual's feeling at the time of group decision making	Pain, incompetence, frustration, irritation or anger	Group Euphoria
Individual's perception at the time of group decision making	Coerced into making a decision leading to an air of detachment from that decision	Decisions made out of own freewill leading an air of attachment for that decision
Individual's satisfaction with the decision	Dissatisfied	Satisfied
Individual's opinion about the future of the decision	Negative	Positive
After failed decision making	Conflict: crumbled cohesiveness	Esprit de corps: higher cohesiveness
Unit of analysis	Individuals	Groups

Figure 2. Fundamental Differences between Abilene Paradox and Groupthink (adapted from Kim 2001)

Public Agreement – Private Disagreement
Group members agree that the current situation is not acceptable. Privately however, the members might not be dissatisfied with the current situation once they have compared it to a proposed alternative.

↓

Spiral of Silence
The silent assumption of group members that their private thoughts are a minority leads to ineffective communication among group members. When several individuals express strong support for a decision, which in fact is a minority opinion, others acquiesce because they presume it is a majority opinion.

↓

Vocalization
Voicing of group sentiments is based on inaccurate assumptions or misinterpretation of the "signals" given by other group members. This results in actions that no one in the group desires or supports.

↓

Decision-Makers Reprise
Members of the group begin questioning the decision. Upon reflecting on these questions in hindsight, group members often become frustrated and dissatisfied, not only with the joint decision but also with the group as a whole.

↓

Recognition Failure
The manager or the leader fails to recognize the process that occurred in making the poor decision and so may not avoid making similar poor decisions in the future.
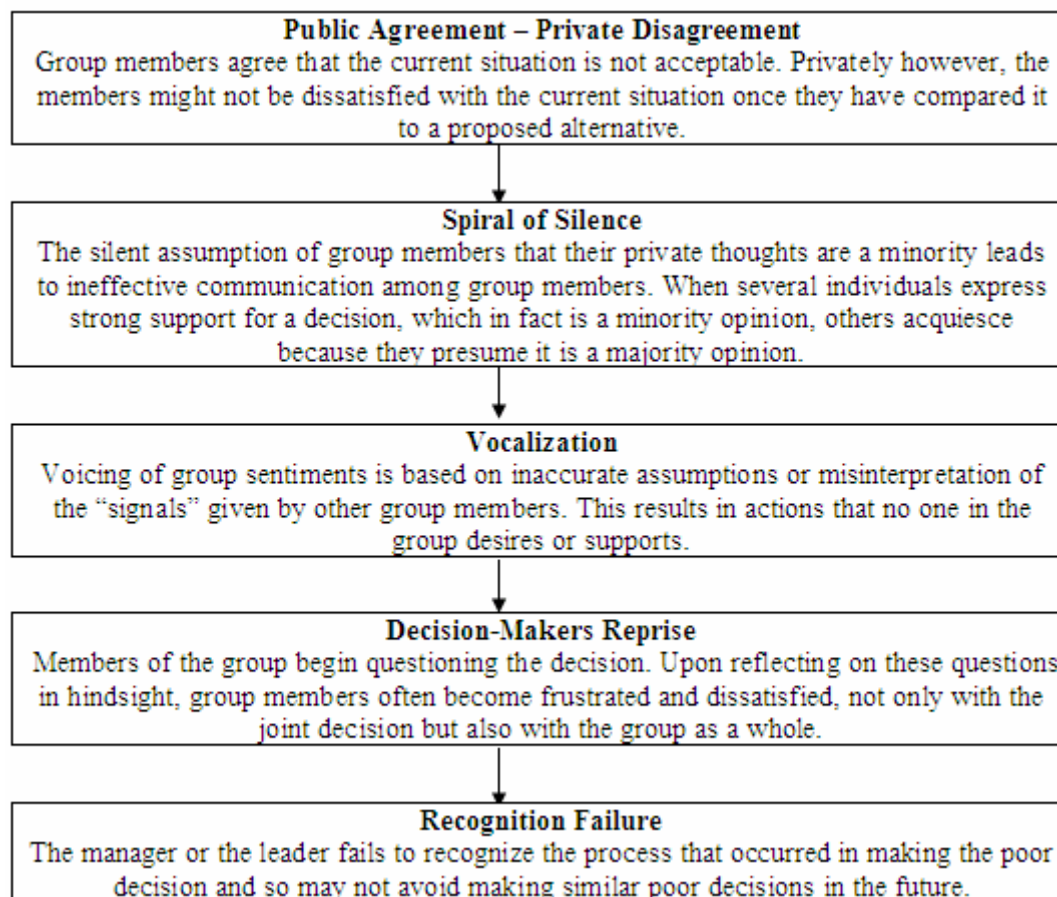
Figure 3. Components that Lead to the Abilene Paradox (Adapted from Harvey et al. 2004)

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