Making Sense of IS Project Stories

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INTRODUCTION

Stories of failure make a compelling read, however, researchers with a keen interest in information systems failures are faced with a double challenge: Not only is it difficult to obtain intimate details about the circumstances surrounding such failures, but there is also a dearth of information about the type of methods and approaches that can be utilised to collect, describe and disseminate such information. The purpose of this chapter is to highlight some of the available approaches and to clarify and enhance the methodological underpinning that is available to researchers interested in investigating and documenting phenomena in context-rich and dynamic environments. The chapter begins by framing IS project failures in context, before highlighting the role of forensic failure investigation and the typical tools employed in gathering information. It encourages a move from case studies to case histories to capture the essence, dynamics and complexities of failure stories. It concludes by introducing a new range of antenarrative approaches that represent future developments in the study of IS failures, enabling a richer interpretation of linked factors that underpin IS failures.

BACKGROUND

The popular computing literature is awash with stories of IS project failures and their adverse impacts on individuals, organisations, and societal infrastructure. Indeed, contemporary software development practice is still characterised by runaway projects, late delivery, exceeded budgets, reduced functionality and questionable quality that often translate into cancellations, reduced scope and significant re-work cycles (Dalcher, 1994). The net result is an accumulation of waste typically measured in financial terms. For example, in 1995 failed US projects cost $81 billion, with an additional $59 billion of overspend, totalling $140 billion (Standish 2000). Jones contended that the average US cancelled project was a year late, having consumed 200% of its expected budget at the point of cancellation (Jones 1994). MacManus and Wood-Harper (2007) reported that the cost of software project failure across the European Union in 2004 was €142 billion. More recently, a McKinsey-Oxford survey of more than 5,400 software projects revealed that half of all projects significantly fail on budgetary assessment, while 17 per cent of projects actually threaten the very existence of the company, with the average project running 45 per cent over budget and seven per cent behind schedule, while delivering 56 per cent less functionality than predicted (Bloch et al., 2013).

IS failure investigations start with extensive attempts to collate relevant evidence. However, in most cases the researcher is exposed to specific information post-hoc, i.e. once the failure is well established and well publicised and the participants have had a chance to rationalise their version of the story. Most of the available sources are

therefore already in place and will have been set up by agencies other than the researcher.

The purpose of a forensic investigation is to explain a given failure by using available information and evidence. The term Forensic is derived from the Latin 'Forensis', which is to do with making public. Forensic Science is the applied use of a body of knowledge or practice in determining the cause of death. Nowadays extended to include any skilled investigation into how a crime was perpetrated. Forensic systems engineering is the post-mortem analysis and study of project, product, artefact or service shortfalls and failures, which aims to uncover systemic and underpinning causes (Dalcher, 1994). The work involves a detailed investigation of a product or service, the underpinning project, its environment, decisions taken, politics, human errors and the relationship between subsystems. The work draws upon a multidisciplinary body of knowledge and assesses the project from several directions and viewpoints. The aim of forensic analysis is to improve the understanding of failures, their background and the dynamics that lead to them. The concept of systems is a central tool for understanding the delicate relationships and their implications in the overall project environment.

Forensic systems engineering is primarily concerned with documentary analysis and (post-event) interviews in an effort to ascertain responsibility lines, causal links and background information. The primary mode of dissemination of findings, conclusions and lessons is through the publication of case study reports focusing on specific failures. However, there are limited research methods to explore the dynamic and fragmented nature of complex failure situations. Lyytinen and Hirschheim (1987) noted that more qualitative research methods were needed for IS failure research as well as more extensive case studies that explored problems in more detail and viewed solution arrangements in light of what transpired. The same methods also need to account for group issues and cultural implications. Sadly, thirty years on, the same constraints in terms of methods are still in evidence.

DESCRIBING FAILURE

Making sense of IS failures retrospectively is difficult. In general, there is very little objective quantitative failure information that can be relied upon. Instead, interpretation requires understanding of and engagement with the wider context. Indeed, a specific feature of failure is the unique interaction between the system, the participants, their perspectives, complexity and technology (Perrow, 1984). Lyytinen and Hirschheim (1987) pointed out that failure is a multifaceted phenomenon of immense complexity with multiple causes and perspectives. Research into failures often ignores the complex and important role of social arrangement embedded in the actual context. This is often due to the quantitative nature of such research.

Understanding the interactions that lead to failures likewise requires a humanistic stance that is outside the conventional positivist norm to capture the real diversity, contention and complexity embedded in real life. Forensic analysis thus relies on utilising qualitative approaches to obtain a richer understanding of failure phenomena in terms of action and interaction.

The fact that a failure phenomenon is being investigated, suggests that attention has already been drawn to the complexities, breakdowns and messy interactions that such a situation entails (i.e. the investigation is problem-driven). Many such inquiries deal with subjective accounts including impressions, perceptions and memories. The aim of the researcher is to increase in a systemic way the understanding of a situation, yet do so from a position that takes in the complexity of the entire situation and incorporates the different perspectives and perceptions of the stakeholders involved.

Overall, the purpose of a failure research method is to enable the researcher to make sense of the complexity of detail and the complexity of interaction and chart the contributory role of different causes and issues in the build up to failure. However, the armoury of research methods in this domain is often limited to case studies.

The term "case study" is an umbrella term used in different contexts to mean different things that include a wide range of evidence capture and analysis procedures. Yin (2013, p.14) defines the scope of a case study as follows:

"A case study is an empirical inquiry that:

- investigates a contemporary phenomenon in depth and within its real-life context, especially when
- the boundaries between phenomenon and context may not be clearly evident"

A case study can be viewed as a way of establishing valid and reliable evidence for the research process as well as presenting findings which result from research (Remenyi, 1998). According to Schramm (1971) the case study tries to illuminate a decision or a set of decisions and in particular emphasise why they were taken, how they were implemented and with what results. A case study is likely to contain a detailed and in-depth analysis of a phenomenon of interest in context; in our case, the failure scenario. Table 1 summarises some of the main advantages of using case studies.

Table 1: Main advantages of using case studies:

- ✓ ability to identify and focus on issues
- ✓ richness of detail
- ✓ multiple perspectives
- ✓ multiple sources and types of data
- ✓ multiple explanations (no absolute truth)
- ✓ cross disciplinary remit
- ✓ ability to recognise and minimise inherent complexity
- ✓ ability to handle conflict, disparity and disagreement
- ✓ ability to show interactions
- ✓ ability to observe emerging patterns
- ✓ opportunity to focus on the particular
- ✓ ability to gain real insight and understanding of a situation
- ✓ conducted in real-life (natural) setting
- ✓ encompasses original problem context
- ✓ ability to deal with interpretations

- ✓ features intensive analysis
- ✓ can extend the boundaries to include aspects of wider system environment
- ✓ can be accumulated to form an archive of cases
- ✓ can be strengthened and expanded with longitudinal features
- ✓ often retold in story format, which is more accessible to practitioners

The general aim of the case study approach is to understand phenomena in terms of issues in the original problem context by providing the mechanism for conducting an in-depth exploration. They often result from the decision to focus an enquiry around an instance or an incident, as they are principally concerned with the interaction of factors and events. The combination of a variety of sources offers a richer perspective which also benefits from the availability of a variety and multiplicity of methods that can be used to obtain new insights about this single instance. A Case study allows the researcher to concentrate on specific instances in their natural setting and thereby attempt to identify the interacting perceptions, issues and processes at work, ultimately resulting in in-depth understanding. Crucially, the focus on a single incident thus enables the study of the particularity and complexity of a case, thereby coming to understand the activity within important circumstances (Stake, 1999) whilst including multiple sources of evidence and differing perspectives.

There are a number of general objections that are associated with the use of case studies (see Table 2). However, one must recognise that case studies are more likely to be used retrospectively rather than as an on-going perspective (especially from a failure point-of-view), as researchers are unlikely to know the potential for useful results and interest from the outset and may have difficulty in negotiating access to the location. Indeed, Yin (2013) concedes that using case studies for research purposes remains a most challenging endeavour.

Table 2: Main objections to the use of case studies:

- ❖ sometimes viewed as soft data (but some argue it is hard research)
- ❖ biases inherent in accepting views and perceptions
- ❖ questions about generalisability of findings (especially from a single case), but it is possible to build a library of such cases
- ❖ issues regarding objectivity of approach and perceived lack of rigour
- ❖ negotiating access to settings
- ❖ boundaries are difficult to define; but this could also be a strength!
- ❖ mainly retrospective
- ❖ sometimes viewed as likely to take too long and result in massive documentation
- ❖ the observer effect
- ❖ reliability of conclusions
- ❖ there is little control over events, but this may also be a strength

Comprehensiveness of coverage is not necessarily a requirement. The richness of detail can be controlled through the careful placement of systems boundaries and consideration of the wider system environment that is relevant to the specific phenomenon under study. Case studies can be utilised as a source of understanding, which is tolerant of ambiguity, paradox and contradiction. A case study is viewed as interpretative when events in the real world are observed and then an effort takes place to make sense of what was observed, i.e. when one tries to make sense of a

failure from the perspectives of participants. They also offer the potential for generating alternative explanations from the different stakeholder perspectives, thereby allowing the researcher to highlight contradictions, conflicts and misunderstandings.

FROM CASE STUDIES TO CASE HISTORIES

The generally liberal use of the term *case study* requires a tighter definition of its meaning in failure research. While there may be a tradition of using case studies within the IS community, this is perhaps more often borrowed from the MBA culture than as a result of self conscious effort to adopt them as a research approach (Walsham, 1995; Cornford, 1996). Indeed, the case study is typically used more in its capacity as a teaching tool than as a **research tool**. The shift to studying the impact of issues within the organisational context renders case studies particularly useful for investigating failure scenarios. However, the use of the term often leads to some confusion.

Moreover, one of the major complications in failure investigations is in relating causes to effects through extended time horizons (Dalcher, 2000). The implications of actions may not be witnessed for years, or even generations. Delays between making a decision and observing the result distort the causal link between the two. As a result, people tend to associate a different level of severity to events occurring following a delay. The perceived severity is thus diminished with the length of the delay further complicating the task of identifying patterns and interactions that contributed to a given failure. Failure researchers are thus required to provide adequate historical accounts of the interaction between actions, perceptions and the passage of time.

Case studies have typically been used to explore issues in the present and the past and comprise of ethnographic studies, single case studies and comparative case studies, as well as, action research, evaluative, exploratory, explanatory and descriptive case studies. In our experience there is a need to add the failure case study as a special example of a case study focusing primarily on the background, context, perception, interactions and patterns, especially as the failure investigation is likely to take place after the (failure) event. We thus propose the use of the label **case histories** to refer to the retrospective and specialised historical research studies focusing on failure incidents.

The time dimension (sequencing) is critical to understanding interactions and identifying their impacts when stories are constructed. Case histories are concerned with providing the background and context that are required to endow words and events with additional meaning. Background refers to previous history of the system itself, while context refers to interactions with the environment. As failures are time- and place-dependent, the case history framework enables readers to obtain an understanding of the intimate context surrounding the main event. The primary tool available to the community is the Case Histories of failures (derived from the use of the case study method). These represent a detailed historical description and analysis of actual processes from a relevant perspective. Their value is in tracing decisions (and recorded rationale) to their eventual outcomes by utilising techniques borrowed from decision analysis and systems engineering. Indeed, the historical description and

presentation of a chronology of events infused with meaning, intention and understanding are based on the recognition that real life is ambiguous, conflicting and complex.

Case histories thus contain observations, feelings and descriptions. They can be used to construct, share, dispute and confirm meanings, interpretations and scenarios in the context of real events (See for example, Dalcher, 2004; 2007). Rather than simply highlight a chronicled sequence of happenings, they convey a story encompassing a specific perspective, focus, and possibly some inevitable biases. The interpretation plays a key part in transmutating the chronicle into a meaningful story with plot, coherence and purpose. However, constructing a convincing narrative of a complex story with competing meanings, alternative perspectives and inherent prejudices is a challenge in itself.

FUTURE TRENDS: EMERGING NARRATIVES

Failures, in common with other activities that take place in organisations, are based on stories. The verbal medium is crucial to understanding behaviour within organisations and systems, and researchers are thus required to collect **stories**, grounded in practice, about what takes place (Gabriel, 2000; Simmons 2007). Gargiulo (2005) further asserts that effective organisational communication and learning is dependent upon stories: Listening to them is critical to the success of the organisation. Understanding failures often entails the retrospective untangling of complicated webs of actions and events and emergent interaction patterns. Failure storytelling can thus be understood as a combination of narrative recounting of empirical events with the purposeful unlocking of meaningful patterns, or a plot.

Historically, story telling has been an acceptable form of conveying and sharing ideas, norms, values, experience and knowledge of context. It plays a key role in communicating the cultural, moral or historical context to the listener. Indeed, Arendt, (1958) argued that the chief characteristic of human life is that it is always full of events, which ultimately can be told as a story. There are even strong claims that the narrative is the main mode of human knowledge (Bruner, 1990), as well as the main mode of communication, learning and thinking (Fisher, 1987; Gargiulo, 2005; Denning, 2011). Moreover, children are often initiated into culture (and its boundaries) through the medium of story telling, offering models for emulation or avoidance.

In practice, the essence of any good case study revolves around the ability to generate an effective storyline, normally with a unique style, plot or perspective. In a large case, a general theme can be obtained from selected excerpts weaved together to illustrate a particular story. This is particularly useful when the researcher is trying to portray a personal account of a participant, a stakeholder or an observer in an incident, accident or failure. The implication is that the need to address personal aspects of interaction and story is fulfilled by the development of a research-valid narrative. Indeed, Remenyi et al. (1998) contend that a story, or a narrative description, is valid if the resulting narrative adds some knowledge. Furthermore, White (1973) describes a story as ‘the process of selection and arrangement of data from the unprocessed

historical record in the interest of rendering the record more comprehensible to an audience of a particular kind' by inserting a sense of perspective and purpose.

Storytelling can endow listeners with different meanings as stories can be understood in multiple ways. Narratives are neither discovered, nor found: they are constructed. Understanding IS failures is therefore more complicated than the discovery of a simplistic chronology of events as stories are crystallised through infusion with meaning and context. Narrative inquiry is evolving into an acceptable research approach in its own right in the social sciences and in management research circles (Gabriel, 2000; Boje, 2001; Czarniawska, 2004; Boje, 2011; Boje, 2014) as the story format provides a powerful way of knowing and linking disparate accounts and perspectives. When different accounts are combined, the emerging story line benefits from the richness of multifaceted insights.

Developing a narrative requires plot as well as coherence as a story is made out of events and the plot mediates between the events and the story (Boje, 2001; Carr, 2001; Kearney, 2002). The narrative can thus become a powerful mechanism for eliciting and sharing experience in a meaningful way through intimate reflection. In failure stories, the plot often emanates from the actions and perceptions of participants emerging out of the flux of events, in (direct) contradiction with expectations. The storyteller is concerned with the perspective and purpose of participants as well as with the plausibility of the emerging plot. The combination of plot, purpose and perspective dictates the selection of elements, the filling in of links and the removal of 'irrelevant' noise.

Post-modern interpretation contends that most real life stories are fragmented, non-linear, discontinuous, multivariate and incoherent. This has already been highlighted as a feature of failure stories. Such stories also tend to be dynamic, polyphonic (multi-voiced) and collectively produced as they occur in asymmetrical, random and turbulent environments full of tensions and ambiguities. The stories are not plotted as such and they appear to flow, emerge and network offering complex clustering of events, emergent phenomena, causes, interventions, interferences and effects. Moreover, the accounts are often subjective, counter-intuitive and contradictory. This leads to interacting, and conflicting webs of narratives, characterised by coincidences, predicaments and crises.

Generally, stories appear to be improperly told, as a story is an 'ante' state of affairs existing previously to a carefully constructed narrative (Boje, 2001). The **antenarrative**, or the 'real' story, is the fragmented, messy and dynamic, multi-vocal, multi-plotted, multi-version and complex tale. Indeed, modern story-tellers look for new ways and mediums for weaving and depicting a multi-vocal reality, as exemplified by Mike Finggis's digitally shot film *Time's Arrow,* where the screen is split in four to allow for four separate perspectives and sub-stories that occasionally intersect or overlap. In the tradition of post-modern inquiry, a real life researcher is often faced with fragments rather than a whole story to tell; and many of the fragments may reflect contrary versions of reality. This is potentially more acute when the accounts attempt to justify roles of participants in the lead-up to disaster or failure. It would also appear from past analysis that there are hierarchies of stories and stories that exist within, or interact with other stories. Using the terminology provided by Boje, the purpose of narrative methods is to take a complex situation characterised

by collective (yet often conflicting) memory and an antenarrative and construct the plot and coherence that can be used to narrate and guide the story of interest.

The reality in failure stories is of multi-stranded stories of experiences and reactions that lack collective consensus. Indeed the discipline of decision-making has also recognised that making choices is about forming and selecting interpretations from a mosaic of possibilities (March, 1994; Weick, 1995). Not surprisingly, disasters, or traumatic stories, are hard to narrate, understand and justify. Stories have three basic properties: time, place and mind (Boje, 2001) which interact and build up as the story evolves. In forensic case histories, these are further clarified through the identification of the background and context, which clarify and justify the interpretation in the context of the emerging phenomena.

Boje (2001; 2014) and Kearney (2002) contend that the current view is of sequential single voice stories and implies excessive reliance on the hypothetical-deductive approach (akin to simplistic causal pairings). Reality emerges as fragmented retrospectives. Imposing a meaning is insufficient and inadequate, as actors need to find their own voice and make collective sense of a situation. The answer is not to develop Harvard type case studies but to rewrite stories as polyvocal tapestries enabling different perceptions, voices and interpretations to exist, thereby explaining webs of actions and interactions. What is new in this approach is the antenarrative reading which enables narrative analysis methods to be supplemented by antenarrative methods, allowing previously fragmented and personal storytelling to be interpreted as a unified whole. This focus offers alternative discourse analysis strategies that can be applied where qualitative story analyses can help to assess subjective, yet 'insightful' knowledge in order to construct negotiated, 'true' and significant understanding of complex interactions (see for example, Drevin, 2011).

As for the longer-term future, good stories can also benefit from pictures, sound and added depth. Once we have mastered the techniques of telling complex, modern stories, we need to focus on composing that information. Even the most gripping story needs to be made attractive and believable. Textual information needs additional support not only in 'emplotting' and in maintaining coherence and perspective, but also in ascertaining the plausibility of constructed stories and in differentiating between noise and narrative. Developing improved techniques for organising or visualising knowledge (such as Net maps) can therefore help in untangling some of the fragmented strands and in making the stories more realistic and understandable, as well as ultimately more appealing, convincing and memorable.

CONCLUSION

IS failures are a familiar aspect of the reality and practice of software development and operation. Yet, attempts to make sense of their causes are limited by the paucity of methods capable of providing the needed insights. Improving the ability to analyse the systemic causes and their dynamic nature relies on the development of case histories that support historical research and retrospective sensemaking into the context of failure.

Stories provide a powerful research tool that can be used to reflect, share and make sense. With the benefit of hindsight it is possible to re-construct a systematic re-telling of events that have led to a failure. The combination of case histories with narrative descriptions therefore offers richer insights. The narrated structure provides an explanation as to how and why failures occur. The purpose of the structure is to make sense of the rich tapestry of interactions and connections by following an identified storyline that chronicles and links relevant issues within the environment. Engaging with the worlds of others through the medium of a story enables a deeper and richer reflection. Indeed, recounted life may prise open perspectives that would have been inaccessible using ordinary methods and thinking arrangements. Moreover, failure tends to highlight missing and incorrect assumptions and faulty defensive mechanisms and can therefore serve as a pretext to updating the frame of reference or the context for understanding as the listeners learn to construct a meaning and make sense of a highly multifaceted, multilayered and complex situation.

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Key Terms and Definitions:

Failed projects: Projects that are: cancelled before completion, are never implemented or are scrapped following installation. May also apply to projects that involve significant litigation.

Challenged projects: Partially successful completed and approved projects which are late, over budget, and have fewer features and functions than originally specified. The degree of challenge depends on the way constrains are applied and interpreted within the organisation and the priorities and tolerance available in any particular area.

Forensic systems engineering: Post-mortem analysis and study of failed or challenged IT processes, products, artefacts, services or projects aimed at uncovering the systemic causes, dynamics and relationships that contributed to the shortfalls or failures.

Case study: Investigation of phenomena in naturalistic setting, conducted in order to enable an in depth analysis of that phenomena.

Case history: Specialised retrospective historical research focusing on failure incidents. Case histories emphasise the background and context that can help in untangling relationships and causes thus making sense of the events leading to the failure.

Storytelling: A method of communicating and sharing ideas, experiences and knowledge in a specific context.

Antenarrative: The fragmented and messy and dynamic stories of real life in their original context before a clear narrative is developed to explain away a certain aspect.