Making sense of failure to support experimental innovation: a case study of a financial services information system

Marta Gasparin[1*], William Green[1], Christophe Schinckus[1, 2]

[1]University of Leicester, University Road, Leicester, LE1 7RK, UK;
[2]RMIT University, GPO Box 2476, Melbourne VIC 3001 Australia.
*Corresponding author: mg352@le.ac.uk

ABSTRACT

Organisational experiments have been neglected in the innovation literature. In this paper, we analyse an Information Systems development project, which was constructed as an experiment as a reaction to the failure of an earlier attempt. The failed project was the same information system but based on conventional innovation or organisational approaches. We use fluid projects theory, through sensemaking and sensegiving, in analysing historical documents to demonstrate that making sense of failure can lead to subsequent success, and in this case experimenting was integral. We conclude that failure can be re-imagined as a catalyst for learning, which leads to success. The approach illustrated for this is experimental, and understood through a sensemaking process.

Keywords: experimental project; IT system; sensemaking.

INTRODUCTION

This paper explores an experimental project whose outcome was a disruptive innovative IT (Information Technology) system developed as a reaction to a previous project's failure. Failure and success are a normal part of the project innovation journey (van de Ven et al., 1999). There are many reasons for project failure, especially if it is a project that aims to develop radical innovations that contains many unknown variables. For example, the personality of the managers can have a negative impact as a result of their egos preventing successful development (Stashevsky et al., 2006), or it can generate negative emotions that might compromise the learning process, inducing 'ruminant behaviour' (Shepherd et al., 2013). Projects can also fail due to structural problems, the inability of firms to adapt to new technological development, path-dependencies, legal systems (Smith, 1999), and influences within social and political environments (Mitev, 1996).
Project failure can be defined as

> *"project termination due to unacceptably low performance as defined by organisational goals" (Shepherd et al., 2013).*

Whilst there is research on the role of project management planning and the role of uncertainty in the success or failure of a project (Aladwani, 2007), there is little research in the field of innovation focusing on how successful projects have made sense of and learned from previous failure. For projects developing a disruptive innovation there is even less research.

Despite the existence of literature on project failure, there is a gap in how and through which process failure of a project can act as a creative force for an experimental project. In this article, we assume that experiment is one of the key organisational and strategic dimensions (Murillo and Kauttu, 2017) for debates concerning the development of innovation. More specifically, we detail how a well-defined case (in terms of end user requirements), which ended in failure, led stakeholders to reconsider project management. In so doing, we argue that they created a sensemaking and sensegiving process that ultimately transformed the initial project into a success.

In our analysis, we use the concepts of sensemaking (the ability to make sense) (Weick, 1999) and sensegiving (the ability to shape the way others make sense) (Schwandt, 2005) in framing and rationalising failure, so that failure becomes a creative force for a floating project. Floating projects are defined like this because:

> *"They lack clear objectives, carefully defined work packages and phases, and risk management plans" (Lenfle, 2016).*

The aim of this paper is to further investigate and understand how making sense of failure can support experimental innovation and project success. It is important to clarify that this project was not spelled out

as an experiment in the project initiation documentation and processes; however, by carefully analysing the National Bank's annual report of 1995, the owner of the project invited the stakeholders to be part of the process and experiment with a new working model. In the analysis of preceding annual reports that were released by the leading project organisation (the National Bank) in 1993 and 1994, we have interpreted their organisational approach as being one of experimentation. It is not clearly stated as such because the project team needed to build trust with stakeholders.

This IT system was designed to manage the settlements of financial products in the stock market. This requires high reliability. Especially after the failure of the first project, the stakeholders demanded stability and effectiveness. "Experimenting in the process" was not a discourse considered as helpful in the realisation of the project and could have created unnecessary doubts over the likelihood of success.

Analysis and interpretation demonstrates that a failed project can be re-imagined, re-shaped into an experimental one, and then actively contribute to creative success. Despite the cases being historic, occurring in the 1990's, we can learn from the past (Wyatt, 2000) to establish why one system failed and the latter succeeded, and how sensemaking was used in what we interpret as an experimental setting for the construction of the latter platform. The successful project was, therefore, conceived very loosely, as a building space for the new system to be developed. A new design was conceived, rather than duplicating priori hypotheses, but establishing new innovative conceptions of the project, including a different brief, requirements, specification, function, design parameters, and performance criteria.

Following this introduction, the paper will now proceed as follows. First, we present the sensemaking approach, and then the method section. The result section shows how DICE (the successful project) succeeded after the termination of BULLI (the unsuccessful project). We have anonymised the cases, despite all of the material being available on the internet and within research databases, because we want to focus our attention on the experimental process rather than on the final output per se. We discuss the results and conclude with further research suggestions.

THEORETICAL BACKGROUND

A recent article (Lenfle, 2016) emphasised the role of floating project management as a way to deal with innovative products. The article suggests that an innovative outcome requires a project management style that is not based on rational decision making, but on loose meanings and goals that are not defined at the outset. This leads to:

1) An orientation towards practical goals
2) Pacing exploration's time
3) The creation of a community

In both innovative and experimental projects, learning is a critical process, (Matthews, 2017) and essential to advance knowledge in a particular field or innovation. In this article, to examine the floating experimental project, we use a sensemaking framework to analyse the way in which stories of the past allowed managers to reflect and learn through sensemaking (Schwandt, 2005); a complex process (Colville et al., 2015).

This sensemaking allows us to interpret how the failure of the initial project was translated into a successful, subsequent project, since:

> "[sensemaking] refers to processes of meaning construction whereby people interpret events and issues within and outside of their organisations." (Colville et al., 2015)

Thus, sensemaking becomes a central step in understanding experimental projects because it directly concerns the way actors materialise information and how this materialisation constrains actions and identities., It is about understanding the construction of facts rather than being focused on truth (Weick et al., 2005).

The papers published in the first issue of CERN IdeaSquare Journal of Experimental Innovation can be broadly divided into two main approaches to experiments: one based on facts/hard science (Burnet et al., 2017) and one based on emerging actions (Christiansen and Gasparin, 2017). We suggest that sensemaking could be one of the approaches to analyse organisational experiments as emergent, as a way of organising for innovation.

Sensemaking refers to a way of creating a comprehensive and plausible story from enacted cues (Weick, 1993). It is a matter of personalisation and socialisation, and as an ongoing process of making sense of the past, it is retrospective (Weick, 1995). Therefore, sensemaking could be intended as a socially constructed narrative of occurrences.

Sensemaking continuously elaborates on reality as an accomplishment that emerges from efforts to create order by making retrospective sense of what occurs. It establishes for individuals and others a rational account (Weick, 1993) to develop an ongoing retrospective of plausible images that rationalize what people are doing (Weick et al., 2005). In the sensemaking process, actors call for knowledge of previous events through recollections and understandings of an appropriate response, given the situation, consensually constructed, and a coordinated system of action (Taylor and van Every, 2000).

Sensemaking is not a matter of accuracy and completeness, but a matter of plausibility and sufficiency. Plausibility and sufficiency enable action-

in-context which are necessary to be understood to become actions. Through sensemaking, situations and organisations are narrated into existence. Sensemaking also happens when actions are disrupted, and people involved in looking for reasons allow them to resume the interrupted activity and keep working (Weick, 1993). Sensemaking helps people in the organization to construct a more or less stable meaning into existence that enables people to continue acting in the present and the future, staying in touch with the constant flow of experience, and inventing new meanings in the process (Magala, 1997).

Sensemaking is not just a matter of reasoning, but also about senses and emotions (Grinde, 2012) and identity construction (Weick et al., 2005) through discursive practices to shape and direct stakeholders.

In this paper, we have analysed the discourses on the failed project, and how the stakeholders made sense of it to the public and industry, through press and working documents, and the discourses that were constructed in the development of the second project. We are not going to focus on the determinants of failure, but instead study the success of DICE as a result of learning from the failure of BULLI.

METHOD AND DATA

The present study employs an in-depth case-study approach analysing discourses in secondary data and reports; this method is used extensively in the sensemaking research. In this article, the concept of 'experiment' is not used in the research itself but it is a key aspect of the transition between the failed (well-defined) case and the successful (unbounded in terms of protocol) project. In other words, we assume that experiment does not necessarily need a well-defined protocol to be innovative. We illustrate this aspect by proposing an applied methodology involving an "interpretive" approach (Denzin and Lincoln, 1998) to capture and identify the sensemaking of failure in ambiguous circumstances and the sensegiving for the new experimental project.

BULLI and DICE were set up to develop an innovative IT platform to settle prices of financial products' transactions. BULLI was owned by the Stock Exchange and it was built as a traditional project management system. However, towards the end of the project, it was reported by the National Bank and various newspapers that the project failed without strong leadership. The media reported that the poor performance of the BULLI system catalysed negative feelings to the point of an incapacity of those involved to gain closure from the project. Financial newspapers reported the BULLI project failures to have resulted in huge losses, in excess of £80 million for the Stock Exchange and £500 million by other stakeholders in the early '90s. In this setting, the National Bank took over,

in order to avoid the loss of competitiveness in the financial market, and worked to make sense and re-interpret failure alongside analysing the DICE project, which is considered a success as it is still largely in use. When the project's owner became the National Bank, it allowed the team members to treat the project as an experiment to allow them to deliver in half of the time that BULLI was supposed to deliver.

In order to capture the sensemaking and sensegiving process, we analysed the discourses in the press and documents from the National Bank who collected these data. Extensive archival research was conducted in digital library databases EBESCO, LEXIS, The Times, Factivia, The Economist Archive and the Guardian Archives. Academic publications in the British Settlement system were also collected to triangulate the data.

The data set included more than 150 items (newspaper articles, books, and peer-reviewed articles). One hundred and thirty-two were inserted in QSR International NVivo software to facilitate interpretive coding across the items: open and axial coding. Open coding involved reading the documents and coding for themes; axial coding involved relating themes to one another.

The open coding produced the themes of: sense of failure; urge of acting; validation; competitiveness; confidence; institutional changes; innovative processes; experiment in the project.

The axial coding grouped them into:

- Sensemaking of failure: the ability to make sense of the failure and the arising emotions ;
- Sensegiving: the ability to shape the way others make sense, in framing failure and complex situations in order that others can make sense of them; and
- Enactment: the process in which people act and bring structures and events into existence and set them in action, incorporating the sensemaking activities of noticing and bracketing

The documents were coded by one of the authors, while the other two questioned the interpretations through discussion and clarification to inform the elaboration of the emerging theory.

RESULTS

The BULLI system was conceived to displace a legacy paper-based system that was out-dated and not fit for purpose for modern financial markets. Indeed, since the 1980s, computerized systems have replaced traditional trading floors in many leading stock exchanges globally, but this specific Stock Exchange was still operating with the historical paper format.

The aim of the BULLI project was to design and implement a computerised, secure, three-day settlement

system involving the arrangement of money and share transfers between companies (Drummond, 1998). Despite having access to the technical means for developing the new system, the project failed. The Stock Exchange, to remain competitive globally, needed a new settlement service for all market participants, which could: provide electronic book entry transfers, operate with a short rolling settlement cycle, retain registered stock, reduce the movement of paper, provide the option for shareholders to retain certificates, and have an immediate period for detailed specification and validation (National Bank, 1997). BULLI was based on the rational decision-making model, with strong goals and defined milestones, and did not succeed in delivering the innovation.

Indeed, the BULLI project was frequently besieged in the press and reported to be excessively expensive, slow, and not able to meet the agreed milestones. Instead of having strong leadership taking charge of decisions, when there were problems or complaints arising about the technical details of the system, the Stock Exchange proposed modifications to the system, and no one really seemed accountable for the modifications. The modifications were very expensive and the project became unsustainable. After having realised the unfeasibility of the project from a technical, time and monetary perspective, in March 1993 the decision was taken to halt the BULLI project. On the same day, the governor of the National Bank, at the request of the chairman of the Stock Exchange, established a taskforce to develop and run a new project.

Orienting towards practical goals: giving Sense to Failure

The BULLI project aimed to create a modern high-speed and efficient computerised system. BULLI was considered an essential technological innovation to maintain North Europe's place as a financial hub, but failed in coping with the pressures of the different stakeholders, since it attempted to satisfy the needs of all the actors in the market at once. Indeed, one of the issues that emerged from the analysis in the press was that the Stock Exchange embarked on a difficult search for a design that would be acceptable to all of the stakeholders (Rodgers, 1990). After the failure of delivering, the confidence in the financial system was seriously damaged. The emotional response to the announcement of the termination of the BULLI project was very strong in the national financial sector, and in the national press. It was referred as "fiasco", "absolute disgrace", "self-delusion", "collapse", "abortive project", "cash on the barrelhead". Many considered legal actions, as the money invested was considerable, and the suppliers had not been paid (Atkison and Kane, 1993).

Newspapers attributed the failure to a lack of leadership, lack of defined decision making, and lack of

clear accountability (Curie, 1996). The Government commented in the Guardian and New York Times that the failure was humiliating, and caused reputation damage, risking failure in retaining its position as a leading financial competition market. Another newspaper reported the very high financial damage and legal consequences.

A managing director of the broking house commented:

"It is disastrous as a financial community to be seen to be incapable of putting together a decent settlement system."

The National Bank took over, and instead of declaring milestones and a concrete project management plan, it announced a project that can be interpreted to be floating and with only a practical goal: creating an innovative system, within two years, that would allow the Stoke Exchange to settle the transactions of financial products in fewer days than the currently used paper-based system. It did not specify more in the press conference nor in the first bulletin issued.

Temporal pacing of exploration

In this chaotic climate, to overcome the anger derived from failure and maintain the existence of the National Stock Exchange, the National Bank stepped forward to reassure the markets in two strong ways: first, it leveraged its own strong reputation and brand, and two, it promised to deliver in a timely manner. This action and reputation led people to believe that the technological readiness was put into place and the cost of millions would not be wasted in halting litigations.

The financial institutions made sense publicly of the choice of the National Bank as a perfect partner in the implementation of DICE for three reasons: the supervision of financial market infrastructure is a pre-defined role of the National Bank; this institution deals with more financial institutions actors than the Stock Exchange (as a reminder these were the partners of the now failed BULLI project); and, thirdly, the Bank has a historical link with the stock market. The discourse of trustworthiness was created around the negative feelings about the failure of BULLI. The Governor of the National Bank established a task force to deal with securities settlement as a matter of urgency (National Bank, 1997).

Thus, sensegiving was provided by the National Bank in framing the failure of BULLI and ensuring that the new project would be on time and not expensive, based on the fact that it was a reliable institution. However, it did not define the milestones of the project, which was an experimental approach for managing projects at that time. In this way, the team could have time to explore the various innovative possibilities. Whilst the team was given time initially to experiment

with the technology and explore different possibilities, they were aware that they had to come up with a product suitable for adoption within two years.

Part of the process of legitimation for the DICE project involved discrediting the decision-making process of BULLI. This is not completely surprising, as sense-discrediting happens in parallel to sensemaking. (Kramer, 2007) The National Bank issued a series of reports explaining the mistakes in the BULLI project, from a technical and project management level, and how the new team should take them on board for the development of DICE. This process can be interpreted as a way to re-assure the press and the stakeholders that the project was under control and would be productive, even if the process appeared vague.

Creation of a community: Making Sense Of The Project For The Stakeholders

The National Bank had the clear target of delivering an information system that could increase capacity and the number of transactions, increase security, and reduce risk (National Bank, 1997).

The project manager put in charge by the National Bank decided to make sense of the failure by explaining that the London Stock Exchange, responsible for the BULLI project, was a closed organisation not willing to talk with the market. In contrast, in order to gain support for the DICE project, he declared that his team was an independent organisation open to discussing the stakeholders' needs, and unwilling to be put under pressure by the media. The DICE project members sought advice from the market and its stakeholders (National Bank, 1993). This inadvertently made the market and stakeholders authors accountable for the meaning of the new service. The selected team engaged in conversations and narratives with the major stakeholders. This approach helped to make the project meaningful to the stakeholders through the various accounts of the necessity of having the project. The team invited several hundred organisations and individuals to provide comments on the initial specifications within one month of their publication (National Bank, 1993). Through this governance of decisions, the team signalled clearly that they were committed to work to meet deadlines and reach milestones. By asking for comments, the team was genuinely attempting to capture knowledge from stakeholders, as previously proposed in the information technology literature as a suitable approach (Kaye, 1990). However, this was considered unusual in a financial organisation.

After the core specifications were decided, the team agreed to involve a variety of organisations to give suggestions on the project, acting as an open system. In order to deliver a meaningful service, the team needed to understand the unmet needs of the industry's stakeholders. The narratives around the design of an innovative new system, DICE, were constructed around

a simple feasible technology, but still was meaningful for the stakeholders, general enough to be used by different stakeholders, and reasonable, scalable, modular and internationally competitive. Thus, even if the experiment was technically difficult and challenging, the team presented it as accessible for everyone.

DISCUSSION AND CONCLUSIONS

DICE did not succeed primarily because of the technology, but for the new, experimental approach to managing a project, which involved having practical

Tab. 1. Example characteristics of the two projects.

Characteristic	BULLI	DICE
Strategy for the design of the system	-Sought to automate existing complex and manual procedures.	-Seeks to address key causes of market complexity and thus reduce it.
Management of the project	-Management is in the Stock Exchange. It is hard to distinguish a leader and manager, and where the decisions take place.	-Strong and organized leadership. -Centralized decision making Experimental approach to the design of the system, based on small trials and errors and consulting with the relevant stakeholders.
Organisational settings	-Closed. Based on the stakeholders of the stock exchange. Functional.	-Open boundaries. The core team worked to enroll many stakeholders (around 200) and investors in the system.
Design of the IT system	-Difficult; approach: one fits all.	-The design was simplified and modular, in order to adapt it to the local needs.
Goals	-Well defined at the beginning of the project.	-Practical and vague, so the innovation would not have been defined at the beginning of the process, but after having explored different possibilities and experimented with alternative technologies.
Temporal pacing of exploration	-Well defined a priori.	-Only the deadline was initially known, temporal pacing of exploration is granted.
Community	-Not involved. They asked for changes without being accountable for them. -The changes were based on the personal/ organisational gain and interest.	-The stakeholders became involved in the project. -Constructively contributed with ideas and feedbacks.

goals rather than well-defined milestones; having time to explore different opportunities; making the process transparent and engaged with the stakeholders, since in the financial industry transparency is one of the factors that is considered most important to create trust and efficient transactions (Schinckus, 2017). See Table 1 for a comparison of the main characteristics of the two projects. It used an approach that has been analysed according to the literature of exploratory project management and sensemaking. In particular it used practical goals, allowed time to explore ideas and engaged the community in the project.

In doing so, the team developing DICE operationalized and implemented their project by making sense to the market, narrating the decisions, while the National Bank frequently publicised their support for the project. These aspects generated a real innovation in the information system. The team augmented stimuli (information) with sensemaking of their decisions, and explicating the sensemaking and sensegiving process reduced the complexity of the information, allowing meaningful interactions. The way the system was thought and organised was in accordance with the theoretical concept of the perfect market (i.e. higher transparency, reduction of transaction costs) that increased the plausibility of the story associated with and the development of the platform. This aspect was important since it makes sense for stakeholders involved in the financial industry. As mentioned previously, the role played by The National Bank ensured the credibility of this approach and reduced ambiguity.

The National Bank also worked to reduce the ambiguity around the project for the stakeholders through three means: by grounding the sensemaking in the identity construction of the project (by presenting it as trustworthy and reliable); by releasing documents that kept the stakeholders updated; and by adopting a "winner story attitude" (retrospectively emphasizing the start of the project and the decisions taken as successful, as they did in the quarterly bulletin of 1999). Moreover, to facilitate the sensemaking, the Bank was enacting the environments of major stakeholders, driven by plausibility rather than accuracy when the spokespersons were releasing information to the community.

DICE succeeded as a result of efforts to be more transparent than BULLI by engaging stakeholders. In relation to building transparency and trust, daily updates provided by the DICE team communicated a strong technical support to the idea to increase the transaction velocity (i.e. the liquidity) in the market. But also, the sensemaking approach allowed the team to treat the IT development as an experiment, rather than as a project; they were able to explore unconventional ways – for the sector and the time - to engage with the IT development system.

The data also emphasized another point explaining the reasons for the success of DICE: its ability to communicate stories of how the National Bank managed the community and made the many stakeholder members a part of the project, rather than spending time and resources in expanding the technological advantage, that very few stakeholders would have been capable of understanding. The stakeholders were convinced when the Bank stated that failure was not an option and that they needed to succeed and deliver the service, and they worked with the Bank to make sense of the macro-picture of the project to the stakeholders. This ability to "tell a story to stakeholders" (Lagoarde-Segot, 2017) shows the importance of the sensemaking and to what extent the discursive nature of practices can play a key role in producing an innovative information system departing from a failed one, using organisational experiments.

Methodologically speaking our article suggests that in organisations, a well-defined hypothesis in line with project management is not a necessary condition to generate successful experiments, contrasting with the usual science-based definition of experiment.

The findings in this paper can be extended in IdeaSquare. The paper presents an historical case, but it would be interesting to follow a project using a participant observation or action research approach. In an innovative lab like IdeaSquare there might be numerous projects that failed. In particular it is important to ask the following questions when making sense of failure:

- What can we learn from the project failure?
- How do we overcome the negative emotions attached to the project's failure?
- How can we re-imagine the aim of the project?
- What new meanings can the project acquire?
- Does a future project require a new spokesperson? What actions are required to improve behaviour, cognitive beliefs, and negative emotions?
- What was the previous stakeholders' communication plan? How can it be modified to be plausible, understandable by multiple stakeholders and be engaging?

We would like to encourage researchers and scientists to consider a sensemaking approach to make sense of failure and propose a project with practical goals defined, time to explore and engage with end-users, with a basis on learning. We suggest analysing the success of the project, the time and resources invested and the sensemaking process during the project: what happened and how was it handled. Based on this case study of BULLI and DICE, a sensemaking approach will lead to more learning from project failure, and as a result greater opportunities and chances of success for the re-enactment of projects and associated products.

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