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Actor-Networks and the Production of IS Success and Failure

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Abstract

The paper presents an Actor Network Theory (ANT) account of the development of a Web-based information system (IS) in an insurance company. As an industry-first e-commerce system that transacted insurance products direct to the brokers over the Web, the IS was highly praised by the broker community. Its outstanding success in the marketplace however has been tarnished by internal resentment and objections regarding development costs (over budget), delayed project completion (over time) and poor internal functionality. As a result the IS was seen concurrently as a great success by brokers and some company members (mostly those dealing with brokers) and a resounding failure by company managers. As the IS is of strategic importance for the company, its current unresolved situation and the lack of managers' commitment to fund its future development, put company at risk and seriously threaten its future competitiveness. By drawing from the ANT account of the IS development we aim to answer How and Why did it come out that the IS became simultaneously a success and a failure? What are the roles of actors, both human and technical, in the production of the IS success and failure?

Keywords

Web-based IS, IS development, IS success, IS failure, actor-network-theory (ANT).

INTRODUCTION

In 2001, the Australian arm of a large multinational insurance company (dealing primarily in general business and life insurance), which we shall call Olympia, undertook to become the first insurance provider in Australia of web-based e-business services to their brokers. Without much experience, Olympia embarked on the development of the web-based information system (IS), named 'Olympia-Online' that enables selling their business insurance products online. Five years into the making, Olympia-Online emerged as a sophisticated IS, highly praised by the broker community. However, being over time and over budget, Olympia-Online development was perceived as a big failure by most business managers. Furthermore, in its current form Olympia-Online does not meet the internal company information needs. The great success of Olympia-Online externally and its perceived failure internally resulted in the withdrawal of management support, putting its future development in jeopardy.

Olympia-Online was an industry-first e-commerce system in the Australian market that transacted the company's business insurance products direct to their customers over the web. The company had no experience and knowledge about building such systems was scarce in both insurance and IT industry. The final Olympia-Online system was highly innovative in the way it represented company insurance products and enables brokers to sell them. It is expected that the competition may soon catch up and offer similar e-commerce products in the near future. Having accumulated a significant experience and with the advantage of the market leader (with this kind of e-commerce system) Olympia is in an excellent position to maintain and even increase its competitive advantage by developing its Olympia-Online further and faster.

However, developmental challenges and dissatisfaction with both the process and the resulting system (Olympia-Online's functionality: poor support for internal company management processes) seized management support for its further development, thus creating a worrying situation for both the company and its IS. Olympia-Online is of strategic importance to the Olympia company as it is its the only channel for transacting business with brokers (other insurance companies also deal directly, face-to-face with brokers). The lack of managers' commitment to continue funding Olympia-Online's further development, therefore, puts company at risk and seriously threatens its future competitiveness.

How can such a situation be explained? How and why did it come out that Olympia-Online became simultaneously a success and a failure? What are the roles of actors, both human and technical, in the production of the system success and failure? What can we, IS researchers and practitioners, learn from this case? This paper examines these questions by developing an Actor Network Theory (ANT) account of the Olympia-Online project. In the following section we first briefly review the literature on IS failure and raise some issues in the investigation of social and technical factors as contributors to failure. We argue that an ANT account of the IS development might help in understanding how success and failure were produced, thus shedding some light on the peculiar fate of Olympia-Online. After a short description of the adoption of ANT (in the Research method section) we present the ANT account of the Olympia-Online development. The discussion focuses on the ways actors (human and technical) enrolled in Olympia-Online development actor-networks, aligned and translated their interests, and thus produced system's success or failure.

LITERATURE REVIEW

IS failures have been an enduring concern for both IS practitioners and researchers. It has been estimated that around 70% of IT projects fail, wasting billions of dollars worldwide (Nelson and Ravichandran 2001) and having serious consequences for organisations. Some examples of high-profile IS project failures include the centralised payroll system at the New Zealand Education Department (Myers 1994), the disastrous development of 'Socrate' by French Railways (Mitev 1996), the failed patient administration system at NSW Health in Australia (Sauer et al. 1997), the computerised despatch system at the London Ambulance Service and Taurus at the London Stock Exchange (Flowers 1996), and the Internal Revenue Service's development of a new Tax Modernisation System in the US (Nelson and Ravichandran 2001). High failure rates of IS development projects and our inability to understand and explain – let alone prevent – the failures suggest that perhaps our assumptions and our approaches to IS researching have not served us too well.

In their quest to understand why and how IS projects fail, numerous studies found that social/organisational factors, rather than technical, had been dominant contributors to failure (e.g. Sauer 1993; Myers 1994; Hendry 2000; Luna-Reyes et al. 2005; Lee and Xia 2005). Luna-Reyes et al. (2005), for instance, claim that as much as 90% of IS failures are attributed to social/organisational factors. These studies proposed numerous social factors, contexts, structures, forces, practices, etc., pertaining to a particular sort of 'social phenomena', as explanations of technical, management or economic failures of IS.

However, Latour (2005) warns that the social is not something that can explain other non-social phenomena, but should rather be explained. Instead of assuming the social as a particular *sort of things* and social aggregates as given, that can explain the non-social phenomena, Latour proposes that social is a 'type of connections' and a 'peculiar movement of re-association and reassembling' (2005, pp. 2-7). Arguing for a 'sociology of translation' or 'sociology of associations' Latour (1987, 1991, 2005), Law (1988, 1992) and Callon (1986, 1991) proposed Actor-Network-Theory (ANT) to assist us in the 'tracing of associations'. A distinct ontology of ANT includes human and non-human actants or actors, suggesting a 'general symmetry' in the tracing of their associations. To comprehend complex IS development processes ANT researchers do not take the social as given but instead follow the actors as they enrol into heterogeneous actor networks and thus (re)assemble the social. By employing ANT many IS researchers provided robust accounts of the production and reproduction of actor networks in the development and implementation of IS thus enabling deeper understanding of their failure or success (see e.g. Hanseth and Monteiro 1998b; Mitev 1996; Walsham and Sahay 1999; Tatnall and Gilding 1999; Underwood 1998, 2001; Aanestad 2003). As Underwood (1998) explains:

Actor-network theory helps us to understand the course of a project or enterprise. We can ask questions such as "How did it come to turn out this way?" (through the changing alliances of actors), "Who is influencing it?" (who has been doing what scripting?) or "Why are some actors acting this way?" (what scripts are they carrying?). These are not questions with deterministic answers but they allow a rich interpretation of the situation.

By taking such an approach and by developing an ANT account of the Olympia-Online project we avoid any a priori separation of the social and the technical or any assumed 'social factors' as causes of failure. Instead we examine human and non-human actors and how they enrol into heterogeneous actor networks through processes of negotiation and translation. Such an account assists us in explaining how and why Olympia-Online turned out

to be simultaneously a success and a failure. It also helps us understand what roles both human and technical actors played in the (re)production of the system success and failure.

RESEARCH METHOD

Without many prescriptions about how to conduct an ANT study we adopted a general advice 'follow the actors'. One of the authors spent 6 months in Olympia as a member of the Olympia-Online development team. This was handy in gaining knowledge of the company, its management and IS development processes and for subsequent examination of actors and actor-networks. However the actual ANT study of the Olympia-Online project started after the author completed the work in the company. In fact the study was prompted by the author's bewilderment about Olympia-Online's perceptions as both success and failure. Our study initially focused on the development team (where we had close contacts) and then expended as we traced associations.

The tracing of associations and creations and changes of heterogeneous actor-networks lead us to ever new human and non-human actors. At some point following the actors and tracing further assemblages had to stop. While it may seem that such a process never ends and that it has no natural closure, as pointed by McLean and Hassard (2004), a more experienced empirical researcher would know when and where to 'cut the network'. "The trick is, says Miller (1996, p. 630), to select the path you wish to follow, and those which you wish to ignore, and do so according to the assemblage you wish to chart". While we traced many more human actors we managed to interview eleven: test team leader, two architects, two application developers, data migration developer, senior business analyst, business project manager, business expert – underwriting, business expert – liaising with brokers, and senior IS executive. (Others were not available for various reasons.) In the interviews we let actors make sense of the project and their contradicting views and events as if we were saying to them: "We won't try to discipline you, to make you fit into the categories; we will let you deploy your own worlds, and only later will we ask you to explain how you came about settling them." (Latour, 2005, p. 23).

Non-human actors, on the other hand, included: project plans, scope documents, business information requirements, use cases, change requests, test plans, test cases, the project charter, etc. The author working as the project team member acquired a very good understanding of the business rules and logic embedded in the system. Following the non-human, together with human, actors we identified shapes, often unstable and shifting, of heterogeneous actor-networks of interest to Olympia-Online project. We traced emergence of these networks along the project timeline. By graphically presenting 'actor-network maps' and investigating actors enrolments, actions and translations, we developed the ANT accounts of the Olympia-Online project. This involved an iterative process of describing, analysing and revising these actor-network maps, simultaneously using ANT semiotics to reveal the inner workings of various actors and their networks (e.g. enrolling actors into a network and ensuring that members of the network adhere to the enroller's interests rather than their own; using delegates such as technology to exert power and influence others). Drawing from such interpretations we made an attempt to answer the questions of Olympia-Online controversial accounts of both success and failure.

THE COMPANY OLYMPIA AND OLYMPIA-ONLINE INFORMATION SYSTEM

Prior to the development of its Olympia-Online, Olympia was not seen as a major competitor in the Australian general insurance market. All e-business in the Australian Insurance Industry was conducted via 'BrokerLine', an outdated mainframe-based electronic platform, run by Telcom, an Australian telecommunications company. More so than any of their competitors, this platform was vital to Olympia since all its business is mediated through brokers, and Olympia has no direct contact with individual customers in the general insurance domain. In 2001 Telcom announced to the industry that they were ceasing operation of the current e-business platform (BrokerLine) and all companies were required to move their business operations to 'Horizon', a new web-based platform. This situation is presented by an actor-network in Figure 1, that shows the Telcom Company exercising influence on Australian insurance companies to transfer their business from BrokerLine over to Horizon and in doing so attempting alignment with the broker community. Unlike Olympia, most insurance companies transacted their business both directly with individual business and via the brokers (indicated by their reciprocal alignment with both). This is why Olympia was particularly vulnerable to the change of the Telcom platform.

Fearing the loss of all their business, and simultaneously recognising the opportunities a new web-based platform afforded, Olympia's General Insurance (GI) Business Division and Strategy and Planning Division went about putting together a business case for the development of a new web-based e-business system, Olympia-Online (see Figure 2). By inscribing Olympia's interest and its new strategy into the Business Plan for Olympia-Online development and by charging Information Services Department with the responsibility to develop a concrete solution (a new information system to interface with the Horizon's web-based platform) GI Business Division and Strategy and Planning Division succeeded to enrol Information Services Department into the new actor-network (presented in Figure 2). This inscription seems to be strong enough to motivate Information Services department to attempt alignment with Horizon. With a prospect of becoming the only channel through which

Olympia would interact with the brokers in order to sell its insurance products, Olympia-Online development became a key strategic IS project in the Company.

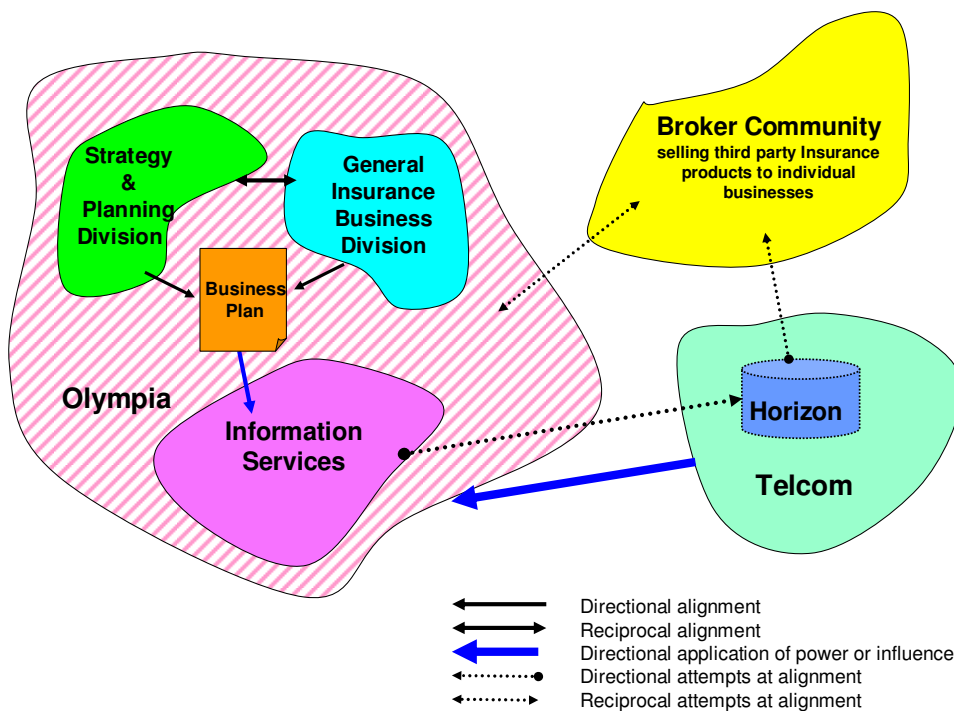


Figure 1 An actor-network describing the situation in the Australian Insurance Industry *early-mid 2001*

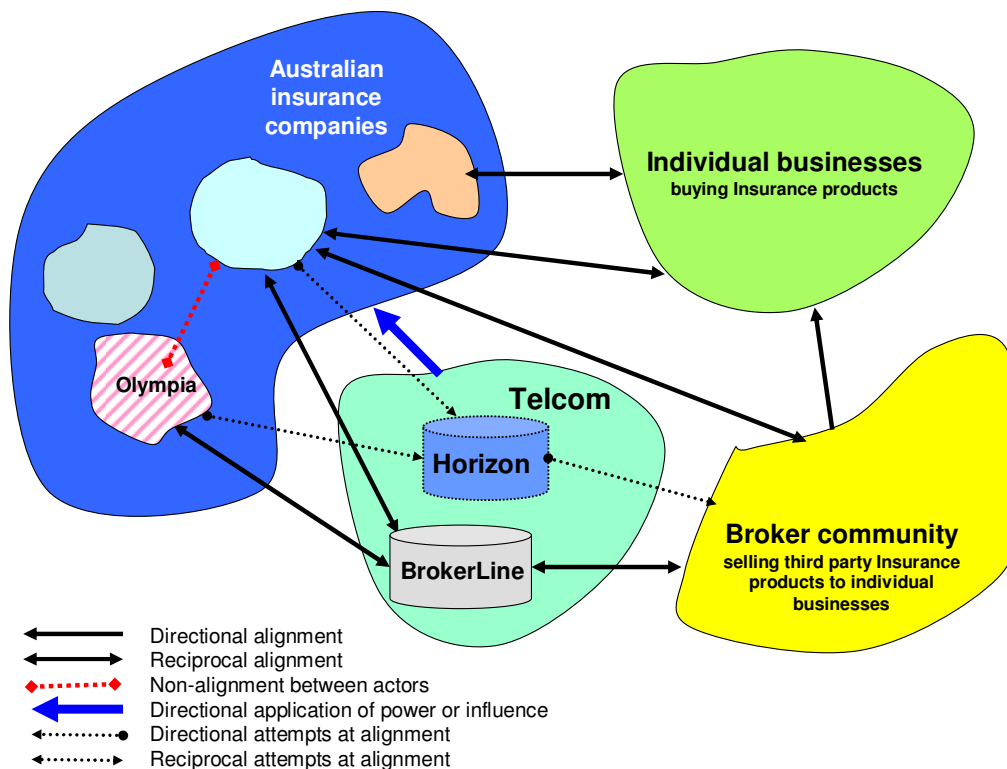


Figure 2 Actor-network describing the influence of Business Plan to develop Olympia-Online on Information Services resulting in their attempt at alignment with Horizon (mid 2001)

HOW OLYMPIA-ONLINE BECAME BOTH SUCCESS AND FAILURE

Olympia-Online was a new type of IS in the insurance industry of a magnitude never experienced by Olympia before. Their Information Services department did not have experience nor the necessary skills and resources to conduct the development in house. To combat this, Olympia attempted to enrol an actor with the capabilities to develop Olympia-Online and ensure Olympia's alignment with Horizon (through actor-network presented in Figure 3).

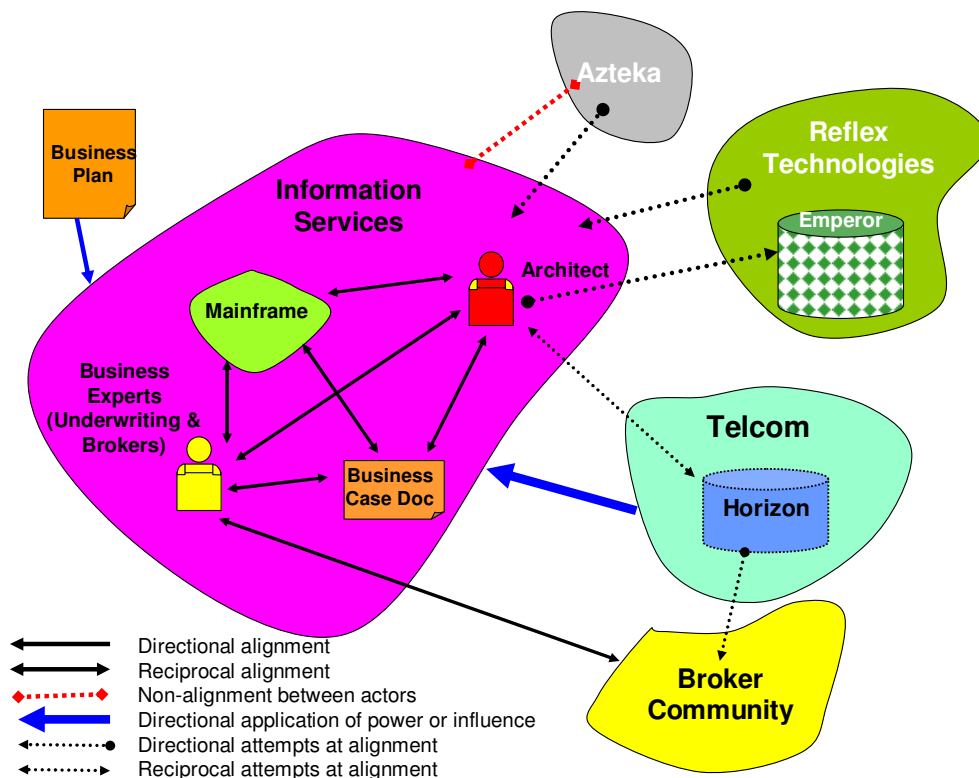


Figure 3 Information Services Department enrolls Reflex Technologies into Olympia-Online development actor-network

Based on the scripts (imperatives) expressed in the business case documentation, two companies attempted to forge an alignment with Olympia (mediated through the Information Services Architect). Azteka was unsuccessful as it was not able to deliver the proposed system within Olympia's desired timeframe (by September 2001). Reflex Technologies was successful as it did promise delivery within the desired timeframe and also offered a fixed-price contract. Developers from Reflex Technologies also demonstrated that the Emperor – a proprietary rules engine of which Reflex Technologies were the sole reseller in Australia – was an appropriate technology upon which the new system was to be built. By successfully aligning themselves with Olympia's strategy (inscribed in the Business Plan), Reflex Technologies and Emperor got enrolled into the Olympia-Online development actor-network. The contract signed July 2001 marked the beginning of Phase 1 Olympia-Online development (planned for 3 months but ended mid 2002).

Phase 1 Olympia-Online design

Phase 1 development began with some initial requirements-gathering sessions, run by business analysts from Reflex Technologies:

We ran some formal requirements gathering sessions, first of all more in terms of use case development, just running scenarios to try and understand functionally what the product was supposed to do. And then there's another level below ... an atomic data level and the business rules come in at that point and basically there's a number of different ways to go about doing that, but we actually first produced data dictionaries - so essentially data modelled the application, and then interviewed some of the key business people to try and tease out specific rules around some of those particular data attributes. And I also have to say some of them were already well understood within the business. (Alan, a Business Analyst)

Once development was underway, several problems began to present themselves from various participants' points of view. As the project evolved, it became clear Reflex Technologies' developers had not grasped the breadth or depth of the problem at hand, resulting in the project running seven months over schedule. During

this time, it also became clear to Olympia's internal Information Services staff involved in the project, that Emperor was not the right engine for Olympia-Online's purpose, and was as such misaligned with Olympia-Online's initial objectives. In retrospect, the Senior Information Services Architect involved in commissioning Reflex Technologies noted that Reflex Technologies "didn't understand the problem at hand" and underestimated both its complexity, costs and the required development time.

Figure 4 depicts the parallel development and confusion prevalent during the Phase 1 development of Olympia-Online. The development was complex in that it required integration between the existing Mainframe System, the new web-based application (on Emperor), an interface and PDF documentation development, which would be the customer's final output from the new system. From this actor-network map we can see Reflex Technologies developers completing the work that required Emperor, Olympia staff developing all the integration between the Emperor component of the system and the Mainframe resources. (The interface development between the Olympia-Online development and Horizon was being carried out by another third party, as was the development of PDF documentation, which is not of interest here). That the work was eventually completed suggests that Olympia's interests were inscribed (through a succession of translations) into this actor-network. However the inscription was not strong enough to coordinate and channel the behaviour of too many disparate actors and thereby stabilize the actor-network. To appreciate its complexity we have to emphasise that within Olympia, there were four actor-networks representing four streams of development, and each of these actor-networks comprised of a project manager, business analysts, developers and supporting technology. Two other actors were overseeing this work – the Project Manager from Reflex Technologies and the Olympia Head Architect, who had trouble ensuring the *final* system delivered the *proposed* system's original goals.

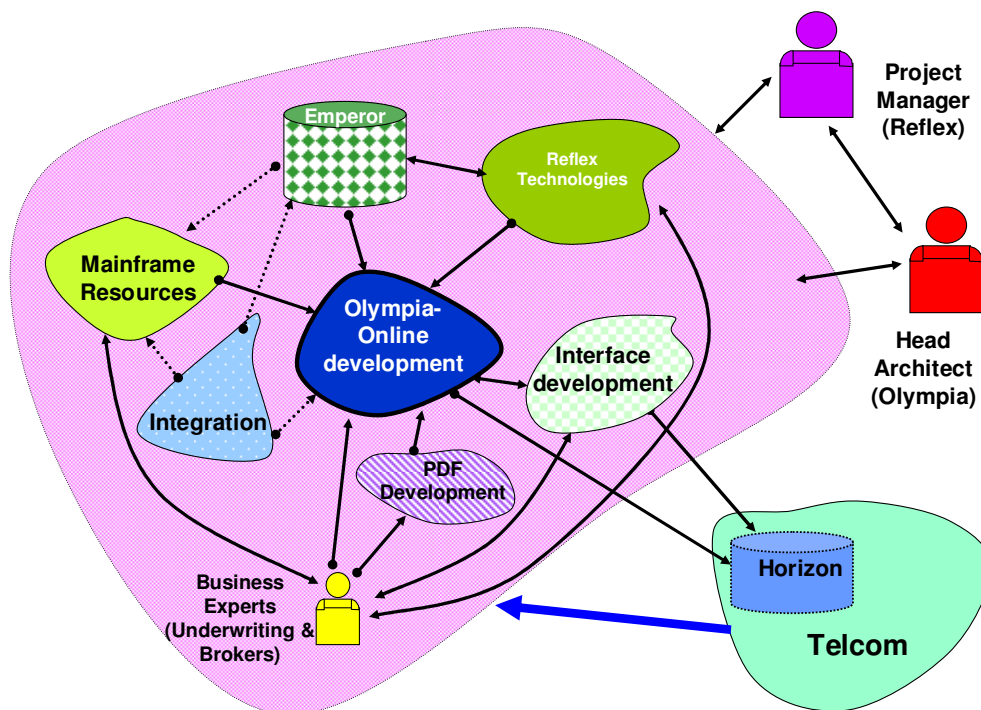


Figure 4 Phase 1 Olympia-Online development actor-network

As Phase 1 Olympia-Online was significantly delayed GI Business Division was anxious to announce to the brokers that the new system is ready for use. They promised that full functionality will be available by mid 2002, which upset Information Services personnel:

[they] shouldn't have gone out and promised that because there's no way in hell we can do it. We just had hundreds of defects outstanding, large parts of functionality not working... At the end of the day they convinced us, everybody put in a huge amount of effort and we sort of got it working with one or two brokers, full functionality, ah, I think somewhere in July [2002]. (George, an Information Services Architect)

However, despite 7 months delay, the implementation of Phase 1 Olympia-Online was considered a success. The analysis of actor-networks of Phase 1 implementation revealed success was primarily due to Olympia's foresight in recognising the power and value in aligning the company with Telcom and the new Horizon platform. This alignment, combined with Olympia-Online's novelty value, which in turn was associated with

being first-to-market with a web-based business insurance product, ensured the new system's success from a market perspective.

On the other hand, this first implementation of Olympia-Online system manifested its poor technical quality, slow performance, frequent crashes and numerous defects. Its design was not modular and hence the system lacked the ability to be scaled to Olympia's future needs. As a result Information Services staff had huge difficulties in maintaining Olympia-Online. They believed that Olympia-Online failures were caused primarily by the involvement of inappropriate actors – Reflex Technologies and Emperor.

However, the Broker Community satisfaction was communicated to Olympia's GI Business Division, which was unaware of the full extent of the system's technical instability, and thought the Olympia-Online system was an unqualified success. Based on this perceived success, GI, in discussions with Reflex Technologies, made the decision to purchase \$1 million worth of Emperor software licensing such that the existing system could be built upon and more products could be developed in the future.

This decision was made without consulting Information Services, a key actor in Olympia-Online development, and the only one with the technical understanding and expertise. They were not involved, however, and when the original Olympia-Online system became so unstable that its use could no longer be sustained, the 'Phase 2' Olympia-Online concept was born, with Emperor as the proposed technology to be used, since GI had already spent \$1 million on licensing. Phase 2 started mid 2003 and the system went alive in April 2005.

Phase 2 Olympia-Online design

One of the major goals of Phase 2 was to bring Olympia-Online development and knowledge in house, since it was key to Olympia's overall strategy and they wanted to prevent tacit knowledge and expertise from escaping the confines of the company. This, goal, however, was not achievable since Olympia was reliant on Reflex Technologies' expertise during system development and design, as they were the only resource providers for Emperor in the market. Essentially, Emperor had become a delegate for Reflex Technologies' interests, and through the purchase of the Emperor license, Olympia had effectively enrolled itself in Reflex Technologies' actor-network, translating and aligning its own interests with those of the third party provider, as opposed to the other way around.

In Phase 2 Olympia-Online development focused disproportionately on short-term issues and cost considerations, at the expense of long-term quality and functionality. This stemmed from the Business Project Manager and the IS Project Manager (two new roles in Phase 2), who were responsible for the system's success in the short term, but seemed not aligned with the system's objectives and ultimate success in the long term. This view was expressed by one of the Business Experts who represented the Broker Community perspective during the project's development:

There was always more of a consideration on the expenditure, the timeframes that IT were actually taking, rather than delivering the business needs in a lot of respects.

This Broker Community Business Expert, however, managed to wield considerable influence within the Steering Committee, translating the project objectives to be aligned with his own. This influence ensured the Phase 2 system was not implemented until a sufficient level of Broker Community functionality and quality had been delivered such that the new system would present as superior to both the existing Phase 1 system and other web-based products that competitors had recently developed in an attempt to attain parity with Olympia-Online.

This Business Expert's high level of involvement resulted in the inscription of the Broker Community's interests in the new system, a strong alignment between the system and the Broker Community, and Olympia-Online's continued market success. This success in the market, however, is once again contrasted with internal failures.

While there was a high level of involvement from the Broker Community Business Expert, there was inadequate involvement from the GI Business Division and administrative perspectives, meaning the Phase 2 system failed to deliver core functional requirements and GI's objectives were not inscribed in the new system. This absent functionality included no management or operational reporting, and an unscaleable system that was unable to deliver more products in the future, meaning that the GI Business Division's interests were not aligned with or enrolled in the new Phase 2 actor-network. This outcome is particularly disappointing for GI representatives, as they were promised the delivery of such functionality. A Senior Manager from within the GI Business Division expresses this frustration:

[Phase 2] should have been it. So, well, you spend a considerable amount of money of Phase 1, you get to redo it in Phase 2 and it, it's disappointing when you hear you might have to do it again in Phase 3, to get what you actually thought you'd be getting in Phase 2.

This absence of core internal functionality has meant the GI Business Division, who was ultimately responsible for initiating future Olympia-Online strategic initiatives are currently not interested in expanding and building

upon the system, as it does not represent their interests to do so. There are, as such, no immediate plans for a 'Phase 3' system, which, according to Olympia's National E-Commerce Manager, jeopardises Olympia's current market-leading status:

[The] problem we're going to have is that it's going to be too late if we try to react to something that happens in the next 6-12 months. So if we want to actually stay ahead then we should be doing something now but it's, at the moment, we're actually told there's no budget for us to actually continue.

The failure to continue strengthening and maintaining Olympia-Online's alignment with Horizon and the Broker Community might expose Olympia to a high risk of failure in the market place and a significant loss of competitive advantage.

DISCUSSION AND CONCLUSION

The ANT account of Olympia-Online development presented above is only an excerpt from a much larger study detailing the emergence and dynamics of various actor-networks, including their strengthening or weakening. In answering how and why Olympia-Online turned out to become simultaneously a success and a failure we shall focus here on a few key actor-networks and their production of the success and failure.

One of Olympia's key successes was its ability to read the market climate, recognising Telcom's threats as an opportunity for the company to differentiate itself from its more powerful and influential competitors by being the first to align itself with the new web-based e-business platform, Horizon. By its announcement that all electronic business in the Australian industry had to move over to the new web-based Horizon system (Figures 1), Telcom intended to reconfigure the insurance industry actor-network. Horizon as a non-human actor had the task to strengthen the network by enrolling insurance companies thus ensuring Telcom's interests. Olympia had two choices: it could rely on the market power of its competitors to block this move, or it could use the new system as a launching pad for the first web-based e-business system in the Australian Insurance market. By enrolling into their actor-network and aligning itself with Telcom and Horizon, Olympia not only became the first member of a new, powerful and attractive network from brokers' perspective, it also reaped the rewards of the first-mover advantage. Brokers' excitement with Olympia-Online in turn made this network even stronger and more durable. Due to Olympia-Online success in the market Olympia itself went from being a relatively insignificant actor in the Australian Insurance Industry actor-network, to becoming a strategic market leader. Olympia's status in the market shifted by such a degree that their competitors were trying to emulate Olympia's success in terms of their use of technology and the services they offer broker partners.

Furthermore, the success of Olympia-Online development resulted from the ability of Information Services staff to align diverse interests of Olympia, the Broker Community and the new Telcom system Horizon and inscribe these interests into the Olympia-Online development actor-network. Especially by translating brokers' needs and interests into the design of Olympia-Online, or in other words, by embodying these interests in "durable materials" (Law, 1992), Olympia-Online implementation and subsequent use strengthened and stabilized this actor-network.

On the other hand, persistent technical problems faced during the development and the failure of Olympia-Online to deliver internal functionality can be seen as resulting primarily from GI Business Division's simultaneous weak alignment with Information Services department. Without perhaps fully understanding its consequences when choosing Reflex Technology as a partner, GI Business Division effectively enrolled Reflex Technology into the Phase 1 Olympia-Online actor-network and thereby enabled them to inscribe their interests through a succession of translations into Olympia-Online via their proprietary technology Emperor. Furthermore, such inscription was highly strengthened by GI Business Division's decision to purchase the Emperor software licence. Alternatively, GI Business Division could have followed Information Services' recommendations not to continue further Olympia-Online development based on the Emperor engine (which would have led to the disassociation of the existing Olympia-Online development actor-network). Instead, due to the purchase of Emperor this actor-network was stabilized and Emperor continued to act on behalf of Reflex Technology, ensuring its interests.

The Emperor software – comprising a rule engine that enables specification of rules and automatic reasoning based on these rules – was designed and maintained by an US company primarily to support product design. Like other tools Emperor's design translated the perceived needs of users (various product designers) and scenarios of use. Due to such inscribed patterns of use Emperor may be more or less suited for a certain type of product design. While it demonstrated some flexibility of inscriptions Emperor was not intended to nor suited for specifying insurance products. As a result considerable efforts (through outsourcing) went into its adoption as a platform for Olympia-Online. Instead of assisting and easing the development through the reduction of the 'cognitive burden' (Johnston, 2001) (which would have most likely led to strengthening Emperor's enrolment and irreversibility of Olympia-Online network) Emperor required more work and increased complexity of the project (thus increasing the cognitive burden). This was a common understanding of all those involved in the

Olympia-Online actor-network. Instead of resistance to change the platform, there was yearning and eagerness for change.

However, such understanding was not shared outside the Olympia-Online actor-network by GI Business Division. As we have seen, purchasing of the Emperor software licence shaped and determined subsequent translations in the Olympia-Online development actor-network and caused significant technical problems and perceptions of the system technical failure with long-term implications. This decision produced irreversibility of this actor-network (Callon 1991) as it became “impossible to go back to a point where that translation was only one amongst others” (Hanseth and Monteiro, 1998, p. 100). The longer Olympia-Online development continued on Emperor technological platform the degree of irreversibility of its actor-network became higher. As a result technical problems persisted and complexity expanded taking more time and resources. Increasingly misaligned with Olympia-Online development actor-network, GI Business Division had less and less understanding of the project and perceived it as failure from a project management perspective (over time and budget) and for not delivering the desired internal functionality.

Through an ANT account of the ways in which business and technical decisions impact both technical and non-technical aspects of the organisation have been demonstrated. Likewise, it has shown the far-reaching effects the political motivations of single stakeholders (or stakeholder groups) can possess, which have the power to influence and construct the perceived success or failure of an IS development project. It should be emphasised that this phenomenon can be particularly damaging to IS development projects that constitute an integral component of a company’s wider business strategy, with the potential to significantly harm a company’s market position, perception, and profits.

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