Inter-Organizational Information and Middleware System Projects: Success, Failure, Complexity, and Challenges

Full Research Paper

Radhouane B N Jrad
Department of Information Systems
and Operations Management
University of Auckland
Auckland, New Zealand
Rad.Jrad@chh.co.nz

David Sundaram
Department of Information Systems
and Operations Management
University of Auckland
Auckland, New Zealand
d.sundaram@auckland.ac.nz

Abstract

Managing projects is firmly driven by its business goals. Simplistically, considering a project as success, or failure, depends on it meeting its objectives and requirements within its resources. While traditional projects are well constructed, Information Systems projects tend to be complex and ill-defined. These problems are exacerbated in contexts of Inter-Organizational Information (IOIS) and Middleware Systems (IOMS). Such Inter-Enterprise System projects are likely to face challenges related to the non-homogeneity of project goals across partners, complexity of relationships within and across organizations, geographical dispersion, legal differences across boundaries, etc. In this paper we explore various approaches identifying outcomes of IS projects: Rational, Narrative, Organizational, and Performative. Furthermore, we identify the complexity and particular challenges of IOIS and IOMS projects and how such approaches towards identifying project success and/or failure are applicable or inapplicable. We conclude with a call for more research to be conducted in this nascent but vital area.

Keywords

Inter-organizational information systems, inter-organizational middleware systems, IOS, IOIS, IOMS, implementation, projects, project management, critical success factors, success, failure, complexity, challenges

Introduction: Projects and their Management

The concept of managing things has been endorsed by humans since antiquity (Cleland and Ireland 2007) as a mean to use, govern, handle, maintain, control, share, protect, and prolong usability and life of owned "things" (Oxford 2014). Project Management (PM) can be defined as a series of activities and processes performed as part of one frame (project) by a defined set of people, from same or different disciplines, in the aim to generate new or improved organizational products, services, and/or processes (Cleland and Ireland 2007). And the mantra of "faster, cheaper, quicker" continues to be the motto to achieve organizational goals through use of projects (Cleland and Ireland 2007).

A traditional project is well defined; with distinct scope and boundaries, as well as clear roles and responsibilities; well aligned with corporate goals; usually with low stakes; easy to report on; with clear schedule and deliverables; producing little risk of conflicts over objectives; and with abundance of templates and processes to manage the entirety of the project's lifecycle (Kerzner and Belack 2010). On the other hand, it is linear; heavily structured; inflexible; methodologically rigid; culturally blind; with little agility to re-plan, particularly in face of unknowns; and is not fit to run over long durations (Kerzner and Belack 2010). While most projects in older fields such as manufacturing can be categorised as traditional (Conforto et al. 2014), in fields with an increased uncertainty about duration, funding, scope,

resources, stakeholders' requirements and the immovability of objectives, traditional methodologies become difficult to implement (Kerzner and Belack 2010). Fittingly, Information Systems (IS) projects tend to be complex with ill-specified goals, for which solutions are often not known at the outset of the project (Conforto et al. 2014; Wysocki 2013).

The purpose of this paper is to look at the success, failure, complexity and challenges of IS projects, and in particular Inter-Organizational Information and Middleware systems projects, and invite more specific research to overcome the alarming rates of failures in such projects. We will first review what constitutes a success and what constitutes a failure of IS projects, as well as existing methodologies used to assess projects' outcomes. We will then assess their effectiveness in Inter-Organizational Information Systems (IOIS) projects, and Inter-Organizational Middleware Systems (IOMS) projects, while highlighting where existing methodologies are failing to answer specifies of these two types of systems. The paper will then conclude with a summary of findings and a call for research.

Information System Projects

IS projects are regarded as change enablers and business processes and services facilitators in today's organizations (Xu and He 2008). Proper management is therefore a critical and important exercise in running IS projects (Hekkala and Urquhart 2012). A dynamic set of Agile Project Management (APM) methodologies has been developed to address complex IS projects with different frameworks, strategies, expectations, challenges, and lifecycles (Kerzner and Belack 2010; Wysocki 2013). Remarkably, there appears to be a strong focus on assessing successes, but more-so failures, of IS projects in a way that can be described as "morbid" (Fincham 2002). There are multiple reasons why interest in IS project failures is significant. The first may well be because in fact there are a lot of failures. Indeed, high rates of failure in IS projects have been well documented from the birth of the discipline (e.g. Cecez-kecmanovic et al. 2014; Cooke-Davies 2002; Mir and Pinnington 2014; Xu and He 2008), and such rates have not improved over 30+ years (Doherty et al. 2011). Philosophically, heuristically and probabilistically, failure is easier to achieve than success (Bosq 2002), as a lot of boxes need to be ticked for success while one unticked box could signify failure. For example, absence of predefined success factors against which the project would be evaluated is likely to lead to failure while their presence does not guaranty success (de Wit 1988). Another reason is the multitude of definitions of what constitutes a failure of an IS project. While on one hand there is a significant divergence between practical and academic thinking when it comes to failure in IS projects (Markus and Tanis 2000), on the other hand what constitutes a success or a failure in an IS project has been assessed as subjective, politically, and interpretational (Cecez-kecmanovic et al. 2014).

In order to study and root-cause-analyse them, great effort has been made to define successes and failures in IS projects. One particular definition that has been greatly referenced is Lyytinen and Hirschheim's (1987). They state that failure can be declared if the output system did not meet its predefined objectives and ended up being abandoned or downscaled, or if the project did not meet the budget/time/specifications constraints, or if users and/or stakeholders are dissatisfied with the new system (Cecez-kecmanovic et al. 2014). In a more extreme view, even the mere perception of failure could be regarded as enough to declare the project as a failure (Fincham 2002). Due to difference in characteristics amongst different projects, it is impossible to generate a universal criteria to assess projects' outcome (Mir and Pinnington 2014). Literature divides approaches to analysis of successes and failures in IS projects into four categories (Figure 1): Rational, Narrative, Organizational, and Performative.

Rational Approach

The rational approach is most common yet most criticised methodology in evaluating outcomes of projects in general (de Wit 1988), and IS projects in particular (Cecez-kecmanovic et al. 2014). Simply put, an IS project is only considered successful if it meets time, budget, and specifications constraints while delivering a working system (Cecez-kecmanovic et al. 2014) (Figure 2). Rational approach is presented as simple, objective, fact-based, measurable, neutral, time-resistant, discrete, and standardizable (Cecez-kecmanovic et al. 2014; Fincham 2002; Reimers et al. 2013). In reality, and as shown in Figure 2, the trichotomy is of polar opposition, with each factor pulling in opposite direction effectively impacting on the two other constraints and making the proclaimed triple-success in reality a compromised success.

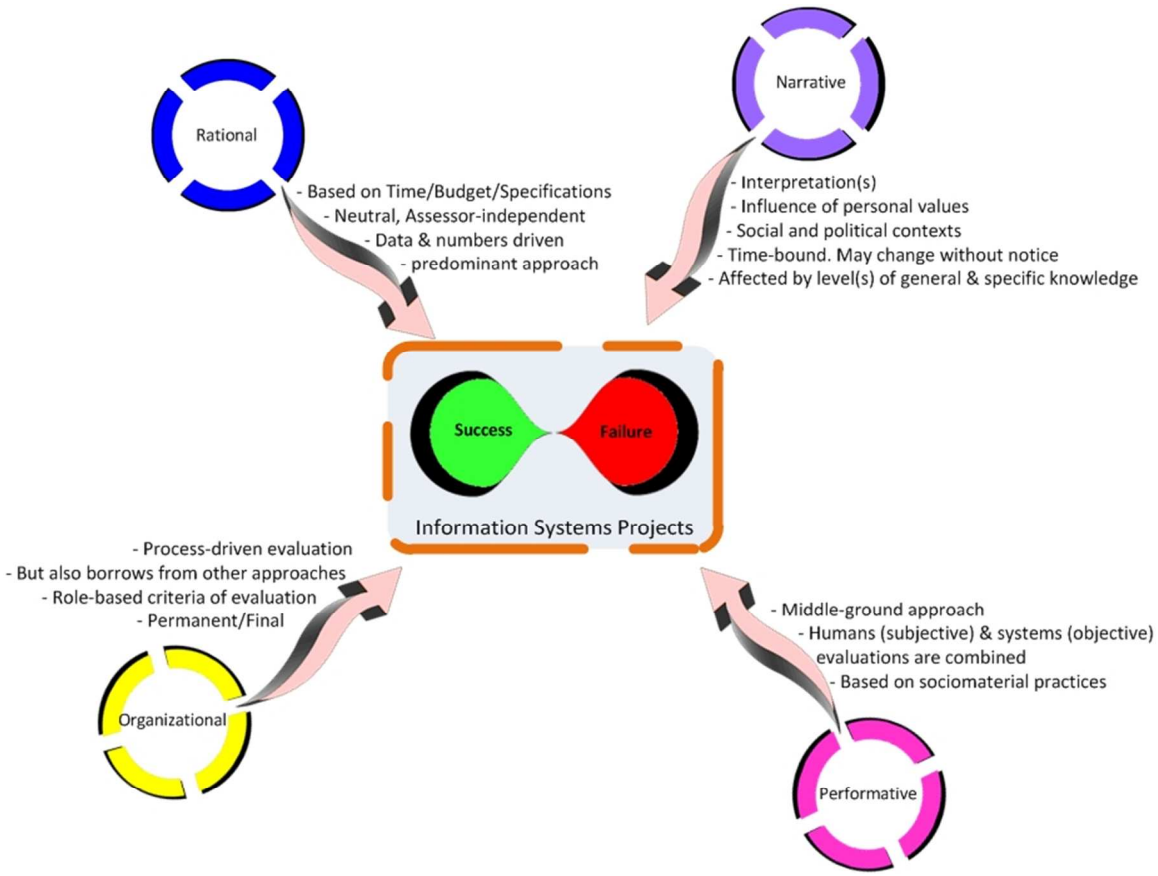

Figure 1. Approaches in assessing success and failure of Information Systems Projects

Indeed, on one hand giving more time for a project costs more; while higher specs require more time and/or budget to implement; and tighter budgets can only be met if time and/or specifications are reasonably achievable. In fact, shortcomings of the rational approach have well been documented. For instance, Doherty et al. (2011) reject that success or failure of IS projects can be determined with mere system properties or basic factors such as information quality or surveying satisfaction.

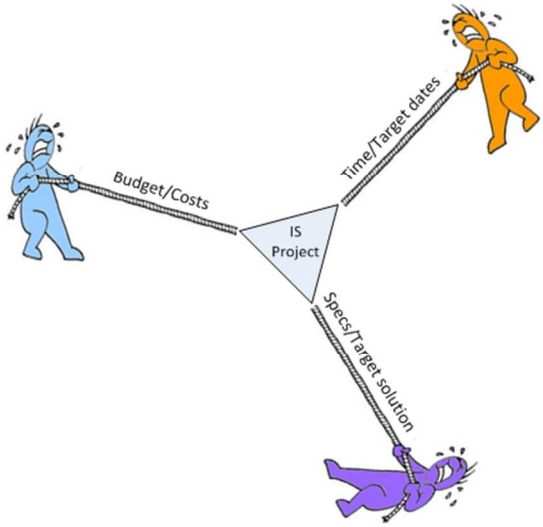

Figure 2. Triangular approach to evaluating outcomes of IS projects

Cecez-kecmanovic et al. (2014) argue against the perceived objectivity of rational measures due to the uncertainty and arbitrariness in their way of representing the objects (i.e. successes and failures) they are measuring. Markus and Tanis (2000) posit that rational approach ignores the unavoidable uncertainty in determining and predicting the actual cost and time needed for the required system specifications. Atkinson (1999) goes a step further stating that in IS projects, time and cost are "at best, only guesses". Kerzner and Belack (2010) add that system specifications are bound to change during and even after the solution is implemented. And benefits of an IS project in effect take time, potentially hiding success elements from initial reports (Cecez-kecmanovic et al. 2014; de Wit 1988). This view has pushed for suggestions to shift away from auditing projects during and after their accomplishment to assess their success or failure, but instead as a mean to know what went right or wrong and derive lessons for subsequent projects (de Wit 1988).

Narrative Approach

The flow of critics against the rational approach in evaluating outcomes of IS projects generated an interest in inserting subjectivity, perceptivity, and interpretive and social constructions in the evaluation process. Such approach has been labelled as "Narrative". It rejects the assumption that IS project successes or failures exist out there and just need to be found and valued. Instead, narrative approach focuses on the perception of success or failure as such by "specific organizational, socio-cultural, and political processes" (Fincham 2002), while acknowledging that the cognitive (rational) and the emotional (irrational) are not mutually exclusive (Hekkala and Newman 2011). Notably, the difference in values and interests have been put forward as the drives for difference in perception of success and failure in IS projects (Cecez-kecmanovic et al. 2014). In evidence, stakeholders in one same organization do not systematically share a common perception of what constitutes factors of success, and the triple constraints of budget, time and specifications, are simply irrelevant to such perception (Davis 2014; Egorova et al. 2009). Furthermore, the timing of assessment does influence the opinion of the same stakeholder on the outcome of a given project (Cecez-kecmanovic et al. 2014). Perception can therefore be labelled as circumstantial. There are even views that narratives of success and failure can are simply reflexive mechanisms to value changes in systems and to give them a social label to legitimize and justify acceptance or rejection of an associated set course of actions (Fincham 2002).

While they attempt to get a closer look in assessing IS projects, narrative approaches tend to be too flexible and circumstantial to be effectively used in an organization. After all, if an organization cannot identify a successful project from a non-successful one, it cannot build on successes and cannot address issues (personal, technical and procedural) associated with failures. Opting for common dominators or waiting for years to assess a project's success is simply unworkable. And relying on stories about success as a means to audit a project is likely to lead to overly optimistic views on the management's ability to control change processes while similar stories about failures are likely to lead to the opposite (Vaara 2002). Meanings, interpretations, narratives, and political negotiations, can even be considered as representations of IS and IS project successes, just like rational representations (Cecez-kecmanovic et al. 2014), effectively associating them with the same limitations as rational approaches. Furthermore, the subjective element of narrative approaches may in fact be its own biggest problems: Beside its technical aspect, IS development has for long been recognized as an intensely political exercise (Hekkala and Newman 2011). And the subjectivity of one's values and perceptions, and the politics surrounding IS projects may dangerously lead to false, or falsified, findings about an IS project's success or failure. Davis (2014) puts the example of Heathrow Terminal 5 in London as an illustration of how a project that was largely successful was perceived as a failure by the public due to minor commissioning issues.

Organizational Approach

A more organization-oriented way of assessing IS projects' outcomes has been endorsed as a path to getting more meaningful findings from the organization's perspective. However, unlike rational and narrative methods, this organizational approach has not always been clearly identified (Davis 2014), nor has it been classified on its own. One possible reason for such omission is that it fundamentally borrows from the 2 aforementioned approaches. The origins of organizational method to evaluate IS projects' outcomes can be traced back to the 1980s and 1990s and the arrival of Critical Success Factors (CSF) as a way to relate projects to the organization (Davis 2014). While organizations continue to strongly use the

Budget/Time/Specifications methodology in evaluating the outcome of an IS project, feedback from project members, end-users, and various stakeholders, has had an increased weight on the final declaration of success or failure. This has been further highlighted with the booming use of contractors to run IS projects (Bryde and Robinson 2005; Davis 2014; de Wit 1988). CSF have become critical to IS projects and a lack of clear agreement between client and contractors on them has been identified as a common source of failed project perception from either of the two sides (Bryde and Robinson 2005).

The focus in organizational evaluation of IS projects' success is on both the short and long terms, and acknowledges that different stakeholders are likely to have different views and impact on the running and outcomes of an IS project (Davis 2014; Wang and Huang 2006). Criteria like organization's objectives, customer's benefits, and future potentials to the organization (de Wit 1988), as well as the project's performance (Wang and Huang 2006) and teamwork effectiveness in delivering the target solution (Mir and Pinnington 2014; Xu and He 2008) have significant impact on the success of the project.

The organizational approach can be presented as a diamond relation between the rational triangle of Time/Budget/Specification and a less significant but still critical success key that we label as "Satisfaction" (Figure 3). Satisfaction may start before the project implementation (e.g. project team positively buying into project's goals (Xu and He 2008)), and may include more than just elements of the organization (e.g. public perception (Davis 2014)).

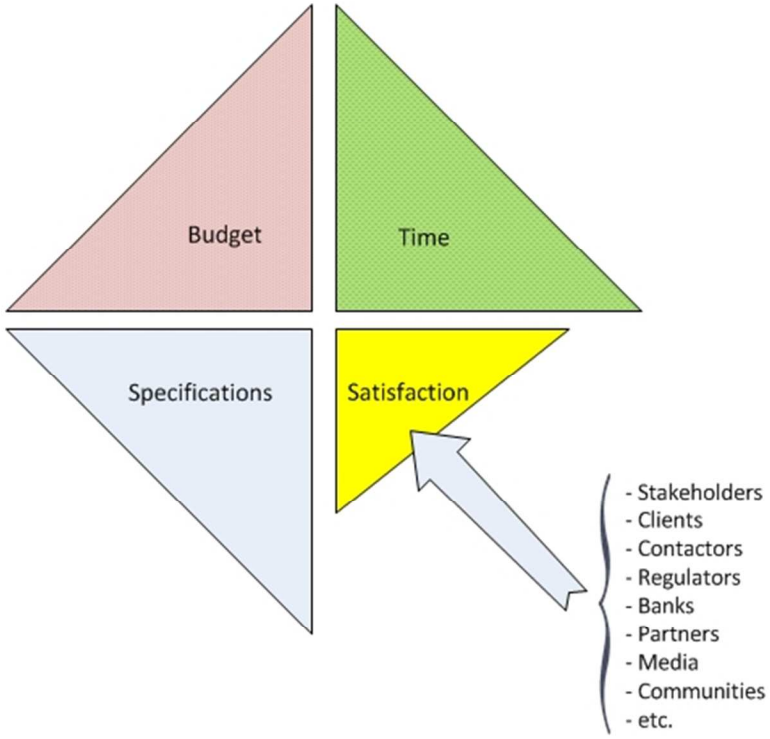

Figure 3. Organizational approach to assessing success and failure of IS projects

Performative Approach

Performative approach is a newly proposed method in evaluating outcomes of IS projects. It attempts to shift the focus from rational and narrative lenses into looking at sociomaterial practices and how they produce realities (Cecez-kecmanovic et al. 2014). While the usage of the performative approach in assessing IS Projects is being championed by Cecez-kecmanovic et al. (2014), the idea of overcoming the dualism of Objectivity/Subjectivity in evaluating IS (e.g. Introna and Whittaker (2003)) and the usage of sociomateriality in research, particularly in management research (e.g. Orlikowski (2007, 2009)) have already been in discussion amongst scholars. Performative approach argues that technology is not a casual force of social outcomes, but a relevant agent in any organization and an influencing factor on how IS projects are evaluated (Paul M. Leonardi et al. 2012). This is a significant demarcation from the

otherwise common approach to material elements as constraints (Paul M. Leonardi et al. 2012), or as unnoticeable, or autonomous, or accessory elements (Orlikowski 2009). Orlikowski (2009) argues that sociomateriality concept takes roots in the fact it is no longer possible to clearly demark where humans as agents and entities end and where objects start: We effectively live in a hybrid entanglement (Latour 2005; Paul M. Leonardi et al. 2012), and so we should account for such entanglement when doing research in or on IS projects.

To apply sociomateriality into the performative approach as a way to asses IS projects' outcome (Figure 4), Cecez-kecmanovic et al. (2014) drew from the concept of dynamic reality (commonly labelled as Ontological Politics) where there are not many views to one reality but multiple (and debatable) realities (left lane of Figure 4), and applied it using Actor-Network Theory (ANT). ANT is a sociomateriality theory and methodology which regards humans and objects as neutrally equal "actors" (right lane of Figure 4) with more focus on their relationship than on the actors themselves (Latour 1997; McLean and Hassard 2004; Sayes 2013). This is achieved through observation and understanding of events and actions of various actors (Cecez-kecmanovic et al. 2014) (central lane of Figure 4). ANT been criticised in the way it strips humans from their advantage of being humans (Collins and Yearley 1992a), amoral (Amsterdamska 1990); regressive (Collins and Yearley 1992b); ignores power outside the observed network (McLean and Hassard 2004); and how it does not allow for criticising the researcher's judgement (Collins and Yearley 1992a). However, because ANT can be viewed as questioning the very fundamentals of well-established scientific research principles, such critiques could be interpreted as a "normal" resistance to paradigm shifts.

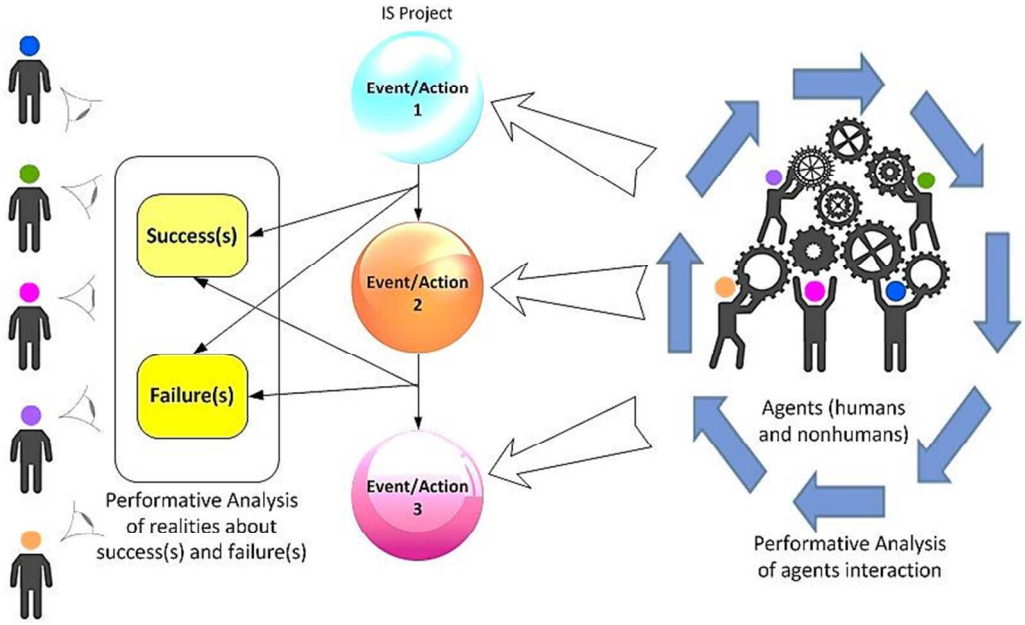

Figure 4. Performative Approach to assessing success and failure of IS Projects

The aforementioned problems in assessing successes and failures of IS projects would further be exasperated if the audited project was being run across organizational, juridical, and/or cultural boundaries. Inter-Organizational Information Systems (IOIS) are systems that exactly cross boundaries between two or more business partners to enable Business-to-Business relationships (Jrad 2014). Conducting research into the success and/or failure of IS projects in these Inter-Enterprise Systems is likely to face challenges related to the non-homogeneity of project goals across partners, extra complexity of indirect interactions between agents from different organizations, geographical dispersion of these agents, multiplicity of the 'dark side' of power and politics, harder procedures in getting approvals from all involved parties in running the research, etc. We explore such IOIS projects and their challenges and complexities in the following section.

Inter-Organizational Information Systems Projects

It is not only the performative approach that faces challenges in assessing successes and failures of IOIS projects. All approaches in fact are duly exposed to (different) difficulties when it comes to dealing with a unified information system that is dispersed amongst multiple locations and fraction-owned by multiple organizations possessing different managerial styles, business goals, sizes, IT systems, and expectations from the project.

IOIS are universally regarded as key enablers of structural and institutional changes in organizations (Reimers et al. 2013). Over the past decade, the increased globalisation signified an increase in the implementation of IOIS across organizations, locations, and borders (Hekkala and Newman 2011; Hekkala and Urquhart 2012), and with them attempts to standardise information systems in general, and Enterprise Resource Planning (ERP) systems in particular, have become markedly aggressive (Hekkala and Urquhart 2012). However, while the IOIS phenomena has links with virtually every major area of IS research (Markus and Tanis 2000), it still failed to attract enough research interest (Hekkala and Newman 2011; Hekkala and Urquhart 2012; Jrad 2014).

IOIS are not mere technical systems. Instead, they are a constellation of practices and interactions of humans and systems (Reimers et al. 2013). Unlike many other information systems, IOIS are built in complexity (Hekkala and Urquhart 2012) and known to be persistent in existence, i.e. once they are implemented they are extremely difficult to remove from the organization's spectrum. IOIS are also transformable, i.e. they are continuously and gradually changing and evolving (Reimers et al. 2013). These unique characters of both persistence and transformability make assessing the outcome of an IOIS project particularly challenging. But even before that, they make planning and execution of IOIS projects a difficult prospect already.

Failure to implement or upgrade IOIS, ERP, Inter-Organizational Middleware Systems (IOMS), and Enterprise Systems in general, has been well documented (e.g. Beatty and Williams (2006); Dumitraş and Narasimhan (2009); Eom (2004); Jrad (2014); Jrad et al. (2013); Markus and Tanis (2000)). While multiple reasons have been listed to explain such failures, lack of accounting for specificities of these systems has consistently appeared in the list. In the case of IOIS, it is not a standard IS solution, and therefore the way its projects are planned and managed needs to reflect such uniqueness. In particular, when upgrading all or parts of the IOIS, the freedom to choose the path to follow, which was available at the time IOIS was first adopted, is stripped and replaced with the requirement to account for existing processes, the need for business continuity, the existence of legacy processes, and the establishment of habits (good or bad) in using and managing IOIS; all in different organizations and contexts, but at one same time. Significantly, the impact of IOIS, as an Enterprise System, on the employees' work life, their fear of exclusion and redundancy, and the organization's culture, cannot be underestimated as a risk to the outcome of any IOIS project (Scott and Vessey 2002). If perceptions of success are to be considered as relevant to the audit of a project's outcome, then it is critical to pay attention to emotions in IOIS projects because humans are less rational than it tends to be believed (Hekkala and Newman 2011). Nevertheless, it seems that while many organizations have operated under the belief that emotions and rationality are mutually exclusive, they still have tried to control their members to promote rationality over emotions (Pescosolido (2002) in Hekkala and Newman (2011)). The noted consequences have been that projects members are thrust into resorting to formal authority as a way to get things done, which in turn gives rise to the weight of powers in IOIS (Hekkala and Urquhart 2012). Ultimately, the multitier complexity of IOIS upgrade projects has culminated in organizations settling for what is referred to as "optimal success" (Markus and Tanis 2000).

While upgrading processes in general can be deceptively complex (Beatty and Williams 2006) and not always successful (Scott and Vessey 2002), the predisposition to accept a less than full success for a project adds a whole new layer of complexity in measuring its outcome. The targeted Time-Budget-Specifications (rational), the dichotomy of success/failure (narrative), and the unearthing of realities for success or failure (performative) are even less clearer when only some of the findings could be used to call the story a success or a failure.

The reasons for the pragmatic attitude about optimal success in IOIS projects is that after 5 decades of existence, there is a remarkably disperse views worldwide on how to handle the horizontal diffusion of the system over multiple organizations, locations, countries, legal systems, cultures, and time zones (Reimers

et al. 2013) (Figure 5). This, in turn, has been noted to cause multiple events and actions during projects to be out of sync, producing delayed effects, potentially resulting in unresolved problems or missed opportunities; and consequently requiring further (unplanned) actions; potentially causing project failure (Markus and Tanis 2000). In practice, it seems accepted that some problems of IOIS upgrade projects may be pushed to be resolved post-project as part of the organization's Business-As-Usual (BAU)[1] troubleshooting processes. Such move effectively excludes these problems from the project's spectrum and facelift the outcomes, and their assessment. Pushing project work into the BAU territory, however, is not an efficient way to resolve issues, because while projects have allocated budgets, BAU is managed under standard financial and human resources models and expecting to find the time and money to resolve non-BAU matters equates to overstretching the organization's resources. It is likely that upgrade-projects-turned-BAU tasks would remain in place for the next upgrade project to address.

From a vertical view, Information Technology has brought together businesses in IOIS, which otherwise would not have been partners (Figure 5). For instance, Cloud-hosting has become a vogue word in business management nowadays and it meant that businesses rely on IT companies to host some or all of their IOIS. However, if a cloud-hosting company runs into trouble, the impact on their cloud-guests can be devastating (e.g. Microsoft Azure problem in November 2014[2]). This in turn can lead to the success or failure of projects having a dependency on external factors to the IOIS. As shown in Figure 5, crossing vertical and horizontal integrations makes management of IOIS projects particularly complex.

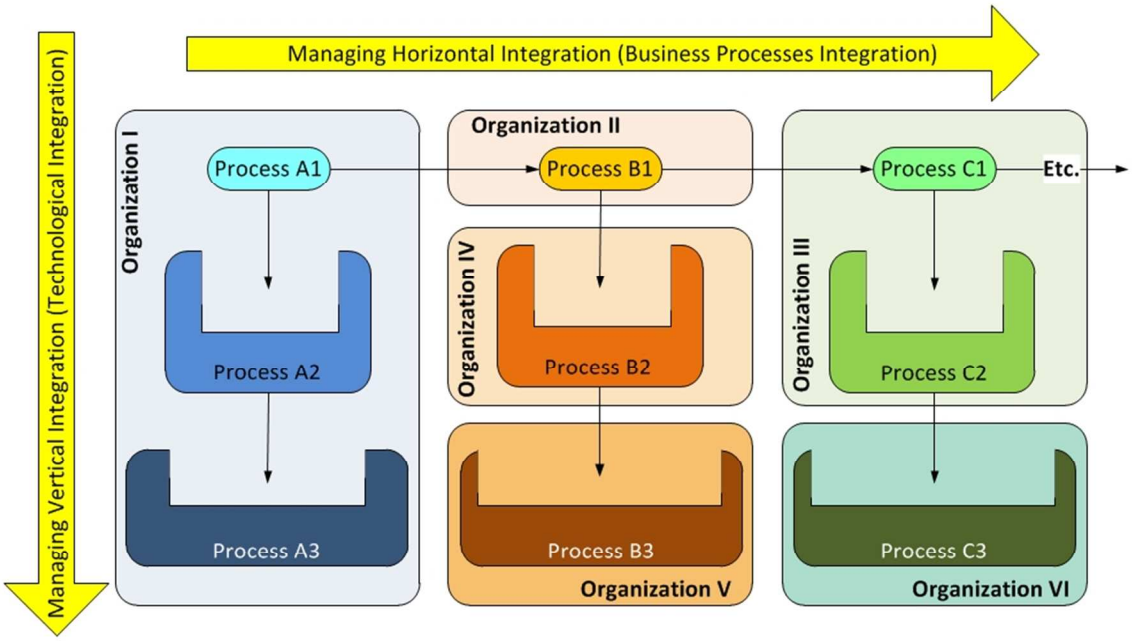

Figure 5. Managing complexity in IOIS Projects

The difficulties in IOIS upgrade projects ensured that the role of project managers is of paramount importance. The likes of Barki & Hartwick (2001), Smyth & Morris (2007), and Choudhury & Sabherwal (2003) have already highlighted the influential role of project management in IS, and how proper structure, effective plans, procedures, clear goals, and effective coordination are critical to project success (Hekkala and Urquhart 2012). IOIS projects, however, require further accounting for factors such as complexity in the identification of goals, scope, expectations, processes, dynamics, political and cultural constraints, risks, and systems amongst partners. It is not surprising that most failures in IOIS implementations do not stem from technology problems *per se* but from the management of the project (Hekkala and Urquhart 2012; Hekkala et al. 2012; Scott and Vessey 2002). Unfortunately, as mentioned above, IOIS as a research phenomenon has failed to attract significant research interest to address these shortcomings (Hekkala and Newman 2011; Hekkala and Urquhart 2012; Jrad 2014).

[1] BAU can be defined as the day-to-day management and operations of the organization (Carroll 2006)

[2] http://azure.microsoft.com/blog/2014/11/19/update-on-azure-storage-service-interruption/

While existing project management practices are not being translated into dominantly successful stories when it comes to IOIS projects, there is not necessarily a need for new approaches or methodologies to adequately address the matter. Just like the rational, narrative, and performative methodologies have been modelled to suit IS projects, they can be further modelled to fit IOIS contexts. Simply, more research is required.

Inter-Organizational Middleware Systems Projects

An Inter-Organizational Middleware System (IOMS) is defined as an "inter-organizational collections of Enterprise Application Integration (EAI) and Enterprise Messaging Systems (EMS) policies, procedures, methods, and services that work together to allow heterogeneous applications from different organizations to communicate, exchange information and validate each other's input and output" (Jrad 2014). The IOMS is responsible for the actual integration aspect in the IOIS, and the interaction of multiple IOMSs from various partners is what effectively enables the B2B process to cross organizational frontiers (Jrad et al. 2013). IOMS is sometimes loosely referred to as "middleware" (Jrad et al. 2013).

Hidden inside the IOIS, IOMS is responsible for resolving incompatibilities between different ERP systems and allowing them to overcome their locational and technological differences (Jrad et al. 2013). While IOMS is critical to IOIS and business performances, it remains a new concept, significantly lacking drive for investigation from IS researchers, and there are two main assumptions in general literature behind such lack of interest (Jrad et al. 2013): 1) Except for small enhancements, IOIS is addressed as one undividable system; therefore upgrading IOMS processes is either only feasible, or worth researching, if it is part of a full-scale upgrade of the IOIS. 2) While IOMS is conceptually part of the IOIS, it is usually considered as a business sub-system of the ERP system, and accordingly assumed to fit under the general requirements for ERP upgrades. Another assumption made towards IOMS is that it is possible and even plausible to have an expert (or a group of experts) creating a single, completely integrated solution for the business (Dearden 1972).

Involvement of IOMS in projects is in reality of a high frequency because for every IOIS change there is a strong likelihood that changes in IOMS are required, while the opposite is not necessarily the case (Figure 6).

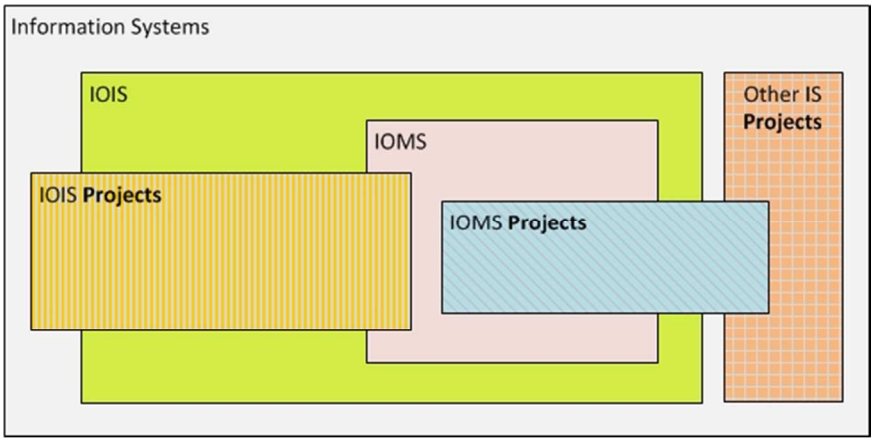

Figure 6. Implicative relationships in Organizational Information Systems Projects

What Figure 6 illustrates is that in general, an Enterprise IS project that does not affect IOIS (e.g. update of the organization's mail server) would not require IOIS changes, while it may require IOMS updates since it is IOMS that caters for communications with IOIS partners on behalf of the organization's ERP system. On the other hand, an IOIS change (e.g. IOIS's database server upgrade) would involve IOMS changes to point to the new server name or IP address. On the other hand, updating IOMS's own database server should be transparent to IOIS (because IOMS usually initiates communications with the ERP system), but may require changes in the Enterprise's IS (e.g. firewall rules to be updated with the new IP address).

Success of an IOMS change is temporarily lived, and so is failure. As a new project is likely to take place early enough to overshadow the previous project's outcome, there is no time for long, and likely mid, term project outcomes to be assessed before the next change kicks in (Figure 7). In reality, it is far from uncommon that multiple projects involving changes in the IOMS are running simultaneously. An IOMS system can therefore hardly settle, almost living in an intermediary status. To add to the complexity, an online review of major IOMS products indicated that on average these systems go out of vendor support, needing an upgrade to a newer version, every three to five year[3]. Organizations would need to further cut about six months to ensure upgrade projects are completed before the vendor deadline.

As seen in Figure 7, while IOIS upgrade projects typically take longer than IOMS upgrade projects and are known to end up requiring time and/or budget extensions, effectively reducing the maintenance period before the next upgrade is due, the short lifespan of an IOMS version makes their maintenance periods between upgrades shorter and more frequent. This is not to say an IOMS projects' outcome cannot be assessed on a long term. Rather, it is useless to do so because time is unlikely to allow for the assessment to be confirmed or refuted. Long term assessments are generally based on assumption, some element of guess, and a forced trust in the product and the words of its vendor.

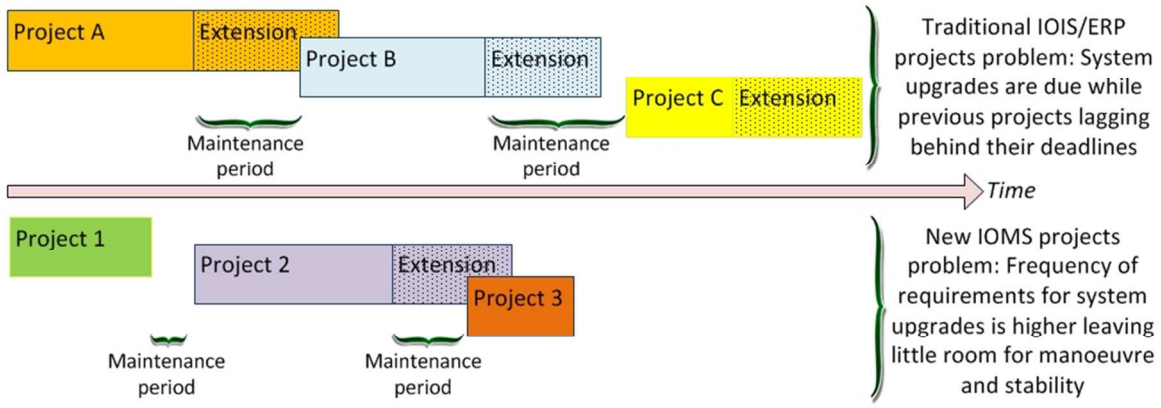

Figure 7. Challenges in managing IOMS Projects Lifecycles

Conclusion

In the 20th century, philosophies, concepts and processes to manage changes in organizations emerged, to then gather momentum and interest, and evolve from the shadow of various theories and practices of general management into their own discipline, namely Project Management. Literature about PM tends to split it into two types: The classical type of PM which orbits around the three constraints/keys of Time, Cost, and Scope; and the complex format of PM for projects that cannot be fit into the traditional category (Cecez-kecmanovic et al. 2014; Conforto et al. 2014; Cleland and Ireland 2007; Doherty et al. 2011; Scott and Vessey 2002; Wysocki 2013). Unfortunately, most IS projects tend to require complex PM. In this paper we looked at IS projects and various ways in which their success and failure are assessed. We followed this up with a zoom onto the particular challenges posed by the complexities of IOIS and IOMS in managing their projects. While there are many methodologies and frameworks for managing traditional IS projects there is virtually no research, informed framework and/or methodology to guide, manage, and inform IOIS and in particular IOMS projects. This paper is a clarion call for more work to be done in this under-researched but vital area of IOIS and IOMS project management.

[3] For instance, at the point of writing this paper, standard support from SoftwareAG for its IOMS stops after 3 years from its general availability (https://empower.softwareag.com/images/wM_7_0_and_older_Release_Support_Policy_tcm121-60540.pdf); Tibco Enterprise Message Service versions are out of support after 4 years (https://support.tibco.com/docs/TIBCOEndofSupportInformation.pdf); and Microsoft BizTalk Server 2013 is supported for 4 & half years (http://support2.microsoft.com/lifecycle/search/?sort=PN&alpha=biztalk).

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