IT Project Selection in an Agile Organisation

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Short Paper

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Abstract

Organisations face a persistent challenge in achieving sustained competitive advantage in the rapidly changing business landscape. Organisational agility (OA), enabled by information technology (IT), offers hope. However, organisations that pursue agility encounter incompatibility with IT project selection (ITPS), where projects are selected and funded before implementation. Existing literature highlights the dual capability of ITPS to enable and disable agility, underscoring its continued importance for agile organisations. To tackle the incompatibility between ITPS and OA, this study presents a case study conducted at Infrastructure Co, an agile organisation that actively undertakes ITPS. Findings show the need for a redesign of traditional ITPS governance to facilitate agility. Infrastructure Co achieved this by delegating and decentralising ITPS processes and decisions away from the enterprise-project-management-office into projects. This study contributes by presenting revelatory empirical findings, addressing this important new research question.

Keywords: organisational agility, IT project selection, ITPS, IT-enabled organisational agility, case study

Introduction

Organisational agility (OA) is the capability of an organisation to rapidly detect and respond to environmental change, thereby outperforming others (Overby et al. 2006; Sambamurthy et al. 2003). Firms that can sense and respond to contextual changes in their environments, are better able than others, to seize market opportunities (D'Aveni et al. 2010; Sambamurthy et al. 2003; van Raay et al. 2023). Agile organisations are those that adopt agile ways of "thinking, operating and organising" across business units or the whole firm (Limaj and Bernroider 2022, p. 2). Agile organisations come in two forms. Firstly, those that are 'born' agile, and have always held an OA capability. Secondly, established firms that adopt agile forms of organisational design, to develop OA capabilities (Gerster et al. 2020, p. 84). In Australia, McKinsey & Company found that, 52% of surveyed businesses were preparing to launch an *agile transformation*, or had one in progress (Hall et al. 2021). Established firms experience difficulties when they adopt to become more agile, specifically with the way they select and financially approve IT projects.

Before IT projects can be undertaken, IT project selection (ITPS) is a necessary business function (Lee and Kim 2001). ITPS is the decision to allocate resources to an IT project within the given constraints on resources, from a set of alternative projects, in order to maximise the net benefit to the organisation (Lee and Kim 2001; Pedersen 2016; Shollo et al. 2015). Firms operate in an environment of constraint. No

organisation has unlimited access to money, time or human capital. It is inherently necessary therefore, to select which projects to pursue (Lee and Kim 2001). ITPS includes three components: methods, processes and people. Many methods have been published by academics, seeking to optimally solve the ITPS problem (Pedersen 2016; Tavana et al. 2013). In practice, ITPS includes "processes by which firms determine whether they should make new IT investments" (Peffers and Santos 2013, p. 131). And people (particularly project portfolio managers) "rely on political skills, experience and personal networks" to make ITPS decisions (Pedersen 2016, p. 55).

Industry frameworks (e.g. PMBOK, TOGAF, PRINCE2[1]) provide a mandate for ITPS in firms (Delisle 2019). However, they give little guidance on how to undertake it. There have been many theories developed by academics, over roughly four decades, to support ITPS (Frisk et al. 2015; Peffers and Santos 2013). Recently, ITPS has been positioned as a function of portfolio management (Clegg et al. 2018; Kester et al. 2011). Good ITPS approaches can reduce project failure and wastage and improve project outcomes (Frisk et al. 2015; Hsu et al. 2011). But despite the generous availability, and prescribed use, of ITPS methods – they are not widely adopted in practice (Akalu 2003; Bernroider and Schmöllerl 2013; Shollo et al. 2015). IT portfolio managers overwhelmingly make decisions based on intuition, experience, and interpersonal relationship networks – rather than using rational models (Annosi et al. 2020; Pedersen 2016). Evidence is used, but judgement plays a significant role (Shollo et al. 2015).

Agile organisations find ITPS guidance to be problematic. Practitioners have described this as a *collision*, requiring firms to "let go of existing governance" (Jacobs et al. 2017, p. 5). Consulting firms advocate for IT project governance redesign, to support rapid decision making. Research must explore how IT governance can enable OA (Gregory et al. 2018). And this must include ITPS (Clegg et al. 2018). Limited research has been identified, which addresses ITPS in agile organisations. It is not that ITPS or OA remains ill-studied, but the two domains must be studied simultaneously to address the problem practitioners face, when conducting ITPS at agile organisations (Clegg et al. 2018; Gregory et al. 2018; van Raay et al. 2023).

The objective of this research study is to determine how ITPS can be effective in and agile organisation. This paper embarks on that objective by presenting empirical findings from a relevant case study. With this objective in mind, there are two research questions: 1) *How does the agile organisation undertake ITPS?* 2) *How do ITPS and OA influence each other?*

Literature Review

There is limited literature that deliberately set out to combine the topics of ITPS and OA (van Raay et al. 2023). Our analysis identified 16 examples where the two topics converge, primarily uncovering various forms of incompatibility between ITPS and OA. ITPS can be less effective in agile environments (Peffers et al. 2003; Serafeimidis and Smithson 1996; Wu and Ong 2008). It can compromise the efficiency required of agility (Overby et al. 2005; Seo and La Paz 2008). Some firms take corrective actions and override ITPS methods (Duan and Deng 2018). But importantly, for firms to achieve agility actually requires ITPS (Dutta et al. 2014; Karimi-Alaghehband and Rivard 2019a; Lu and Ramamurthy 2011; Tallon et al. 2019). Agility requires firms to invest in the right projects, and proactively seek IT based opportunities (Lu and Ramamurthy 2011). And two *micro-foundations* exist in OA: search and selection of IT solutions; and search and selection of IT service providers (Karimi-Alaghehband and Rivard 2019a). This means that ITPS remains important in an agile context, despite at times being incompatible.

Where firms experience inefficiency or ineffectiveness between ITPS and OA, and take corrective action, they either reconfigure ITPS or avoid it altogether (Bradley et al. 2011; Gerster et al. 2020; Goodhue et al. 2009). We find good anecdotal evidence that people override ITPS methods and processes. In several cases at different firms, after applying the model and receiving an ITPS outcome, decision-makers readjusted the model inputs to achieve a different outcome. They did this to "increase benefits", support "a powerful stakeholder view", enact a CIO decision, and "make corrections in obtained ranking" (Klapka and Piňos 2002, p. 441; Sharif et al. 2017, p. 939; Tavana and Sodenkamp 2017, p. 1465). We uncovered these examples, but we did not find sufficient evidence to explain how the firms conduct ITPS in the agile context.

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[1] Project Management Body of Knowledge (PMBOK), Projects in Controlled Environments (PRINCE2) and The Open Group Architecture Framework (TOGAF)

Sensing and responding capabilities are core to IT enabled OA (Felipe et al. 2019; Felipe et al. 2016; Sambamurthy et al. 2003; Tallon et al. 2019). Sensing (environmental change) means detecting and anticipating competitive market conditions (Levinson 2004; Overby et al. 2006; Sambamurthy et al. 2003). Responding means seizing an opportunity with speed and surprise and being ready to implement change efficiently and effectively (Overby et al. 2006; Sambamurthy et al. 2003; Weill and Aral 2006). So we highlight where ITPS may enable or disable sensing and responding. We reviewed the literature, and found themes of methods, processes and people, that describe how ITPS can enable or disable OA sensing and responding.

Many methods and techniques have been published by academics, seeking to optimally solve the ITPS problem (Pedersen 2016; Tavana et al. 2013; van Raay et al. 2023). We categorise them as having a: financial, mathematical, real-options, Delphi or decision-support-system basis. Here we assess the sensing and responding capacities of each type. Financial methods are the most commonly used in practice (Cho and Shaw 2013). They use a small number of quantitative variables to calculate a score which can be used to make ITPS decisions (Tavana et al. 2013). These methods, however, may inhibit agile sensing by focussing solely on financial benefits (Tavana et al. 2013). They ignore other contextual factors, which is required of IT enabled agility (Tallon et al. 2019). Mathematical approaches to ITPS seek to optimise interdependencies between projects to support ITPS (Cho and Shaw 2013). These methods can improve the decision quality of ITPS, which may enable agile responses, because making poor ITPS decisions can decrease agility (Lu and Ramamurthy 2011). However, these methods are designed for consistency, which may inhibit sensing capabilities, which requires a focus on contextual volatility (Lu and Ramamurthy 2011). Real options theory, used to make investment decisions in real financial assets, is applied to ITPS because of its ability to be flexible (Cho and Shaw 2013). This ITPS approach may enable agile responses because options are constantly reassessed against changing market conditions (Benaroch and Kauffman 2000). This allows the firm to sense contextual volatility and make rapid modifications, to IT project proposals (Lu and Ramamurthy 2011; Overby et al. 2005).

A rigorous and model-based method for ITPS (as summarised in the previous paragraph) is recommended in academic literature (Pedersen 2016). Professional literature makes similar recommendations. But these processes are time consuming, which is a problem for agile firms that favour rapid change (Dutta et al. 2014; Gerster et al. 2020). As such ITPS can disable agility with process-based slowness, which inhibits the firm's response capability (Overby et al. 2005). Conversely, if ITPS can be undertaken rapidly it may improve a firm's response capability, allowing it to initiate IT projects more quickly than competitors (Overby et al. 2006; Ravichandran 2018). Process-based governance can enhance OA, but agility enabling IT processes do require further study (Crick and Chew 2020; Lee et al. 2015; Zhen et al. 2021).

People play a controlling role in ITPS, while models and processes are supportive. ITPS methods are chosen, and projects selected, based on cultural and political environments (Pedersen 2016). ITPS decisions are made using judgement based on intuition, experience and personal networks (Pedersen 2016; Shollo et al. 2015). When business and IT staff collaborate during ITPS, projects are more successful (Hsu et al. 2011). Sometimes people manipulate the method or process to achieve a different ITPS outcome, and this has been interpreted as problematic (Sharif et al. 2017; Wilmore 2014). But we propose, that people may be overriding the agility disabling capacities of ITPS methods and processes, pursuant of OA, because agility causes employees to challenge and modify processes that are designed in a top-down manner (Crick and Chew 2020; Crick and Chew 2015).

By reviewing the ITPS literature, with an OA perspective, we find that ITPS is capable of both enabling and disabling OA sensing and responding through the people, processes and methods that firms apply to it. As a disabler, ITPS can restrict sensing because methods are rigid and inflexible; and inhibit responding because processes are slow. As an enabler, ITPS methods enable responding through improved decision quality; and ITPS processes enable responding by acting more quickly than competitors. Further, ITPS methods and processes play a supportive role to people to achieve greater agility. So ITPS and OA both influence each other. Importantly: for firms to achieve agility actually requires ITPS (Dutta et al. 2014; Karimi-Alaghehband and Rivard 2019b; Lu and Ramamurthy 2011; Tallon et al. 2019). This means that ITPS remains important in an agile context, despite at times being incompatible. We found only anecdotal examples of how agile organisations undertake ITPS. As such, empirical field evidence is required to address our research questions sufficiently.

Method

To address our research questions, and explain how ITPS can be effective in an agile organisation, we selected a qualitative case study method to describe the phenomena. Doing so provides rich qualitative findings, that are firmly positioned in existing literature. It is an effective way to explore ITPS decision making in its real-world setting, and gain an in-depth understanding (Yin 2009). The case study approach is well suited to the rapidly changing IT environment (Benbasat et al. 1987). Case study research, in the IS discipline, employing the interpretivist paradigm: has been well established as a popular and effective combination (Keutel et al. 2014). The research aim, objectives and questions – of this study – are all aligned to the four 'appropriateness questions' developed by Benbasat et al. (1987, p. 372). Specifically, the topic cannot be 'studied outside its natural setting'; is focussed 'on contemporary events'; does not require 'control or manipulation over subjects'; and does not 'enjoy an established theoretical base'.

Based on our research questions, and the literature review of ITPS and OA, we defined the case unit of analysis as *an agile organisation that undertakes ITPS*. We refer to our case organisation as 'Infrastructure Co'. Infrastructure Co is an Australian headquartered civil infrastructure asset operator represented in Australia, US and Canada; and is listed on the Australian stock exchange. Infrastructure Co also self-identifies as a technology company, because it relies on innovative technology to outperform competitors, despite owning and managing civil engineering assets. At the time of initial data collection, Infrastructure Co reported annual revenue of AU\$2.3 billion. Infrastructure Co fits the unit of analysis, as follows. Data collection has validated that it is an agile organisation, because leaders have adopted organisational design to improve the OA capability. Data collection included informant descriptions from interviews, and also secondary sources such as media releases and news articles. Infrastructure Co has experienced an "acceleration of the trend to more agile working" and has adopted "an entirely new way of working based on Agile principles". Primary data collection, from informants, also confirms that ITPS is undertaken annually in IT portfolios. Infrastructure Co delivers projects across multiple portfolios, including two that are technology focussed. We studied the *business systems* technology portfolio, which delivers business benefits through investments in technology business systems. Infrastructure Co also has a *technology infrastructure* portfolio, which we did not study.

Sample size, in this qualitative study, should be considered given the objectives of both breadth and depth (Patton 2002). To achieve breadth, samples must be selected until no new information is uncovered; to achieve depth, informational considerations are primary (Guba and Lincoln 1985). We recruited five participants, at Infrastructure Co, who were involved in ITPS. To provide different views of the same phenomena, we included staff from different business units, with varied job titles. The five informants provide good breadth (and reasonable depth) to the case study findings, of this short paper. Further research could include more informants, to increase depth of findings with greater confidence. Table 1 shows some attributes of the informants.

Alias	Job Title	Department	Years in Role
A1	Enterprise Project Management Office (EPMO) Manager	IT, EPMO	4.5
A2	Senior Project Manager	IT, EPMO	4.5
A3	Finance Manager	Finance, Accounting Services	1.5
A4	Project Manager	Partners and Strategic Operations	7.5
A5	Finance Systems Specialist	Finance	4

Table 1: Informant attributes

We also gathered secondary documentation before and after the interviews. Before interviews, publicly accessible documents were used to acquaint us with the organisational context of the site. Documentation included company website, annual company report, and news media articles.

We used thematic analysis as our coding technique. We searched for themes and patterns in the qualitative data, to answer research questions, and applied codes in NVivo software. Thematic analysis is 'systematic yet flexible', is sometimes described as a 'foundational method', and leads to descriptions, explanations and theories (Saunders et al. 2016, p. 579). In this short paper we present findings from a single case and acknowledge that more cases would be beneficial, to fully address the research questions.

Case Study Findings

How does the agile organisation undertake IT project selection?

At Infrastructure Co, ITPS starts with project proposals which are solicited from the business, annually. Those proposed projects are scoped, estimated and presented to the steering committee. Three ITPS methods are used, including: a complexity assessment matrix, net present value calculation, and internal rate of return calculation. The complexity matrix assesses project risk, and the two calculations analyse the financial budgeting implications of the proposed project. Projects, in their $100M portfolio, are classified as: carry-over (from previous year), keeping-the-lights on (e.g. compliance, maintenance etc.), or strategic enablement. The steering committee meets monthly several times, allowing iterative decision making to arrive at a final list of funded projects. Projects, within the categories, are rank-ordered by the steering committee based on benefits (tangible and non-tangible). The key people involved are: project managers (who assist with ITPS project analysis), EPMO (who govern the process), and a steering committee that makes and endorses decisions.

For projects that are approved, by the steering committee, a project manager (PM) is assigned and the project proceeds to implementation. The project management process is phase-gated, meaning projects progress through formal phases with governance control points called gates, when authorised by the steering committee, until project completion. Figure 1 is a diagrammatic representation of the annual ITPS process at Infrastructure Co.
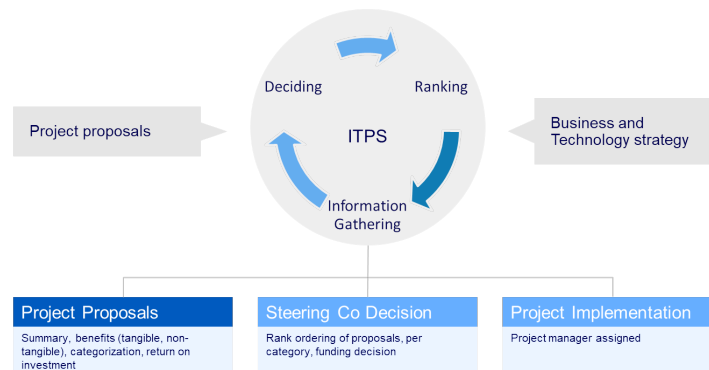

Figure 1: ITPS at Infrastructure Co

How do IT project selection and organisational agility influence each other?

Infrastructure Co is sometimes restricted in how quickly it can respond, if starting a new project, because of ITPS documentation and approval requirements.

However, most informants described Infrastructure Co as being capable of making decisions quickly, compared to other organisations. Partly due to being small (a small number of staff, relative to revenue) and also due to organisational structure. Although, being 'small' also inhibits their capacity to respond, due to resource limitations.

Managers feel slowed down, because the ITPS process is conducted annually.

> *"You sort of got to work within budget cycles" (A4)*

> *"I want to be agile, and I can't wait a year for another budget cycle" (A4)*

The EPMO, at Infrastructure Co, has designed bespoke ITPS governance, iteratively over time, which is more agile than their previous PRINCE2 based governance.

> *"...we've always come back to the [Steering] Committee to ask for their feedback... it essentially helped us to evolve the way we do things" (A1)*

The EPMO undertook change management activities, to implement the bespoke ITPS governance.

> *"That is something that the [Steering] Committee found strange in the first place, so then we do have a role to play in helping them become more accustomed to the way we will talk about our projects" (A4)*

> *"... we put together a pack, which described what agile was, and we could then promote that, and if you like, plant the seeds in the minds of the leadership teams" (A1)*

Because of the need to be agile, and the barrier of the annual ITPS process, PMs hold an undisclosed contingency budget, which enables agile responses.

> *"...an amount of budget set aside to handle shifts in the environment... and new opportunities". (A4)*

Once a project is established and the technology platform is operational, the EPMO delegates the ITPS process, and decision making, to the project.

> *"...rather than having a project stood up for every time... we've now carved out a portion of that portfolio and given it to the finance team, and we say 'this is the governance structure that you need to operate under'." (A1)*

> *"...you're able to make decisions a lot quicker, and they're also a lot closer to the detail..." (A1)*

In summary, Infrastructure Co uses conventional approaches to ITPS based on industry guidance (particularly PRINCE2) and annual budget cycles. This has inhibited their agile capability, so they have developed bespoke ITPS governance. The governance delegates and decentralises ITPS processes and decisions, away from the EPMO into projects.

How IT project selection can be effective in agile organisations

Despite the need to include more cases in our study, we can already propose practical implications from our findings. A small organisational structure enables Infrastructure Co to be agile, because ITPS decisions can be made quickly. Large organisations may emulate this by reducing management layers in their structure. Infrastructure Co needed communication and training, before senior decision-makers were 'accustomed' to new ITPS methods and processes. Organisations can plan change management activities, that will help senior staff to accept new ITPS processes, to enable agility. In Infrastructure Co, PMs hold an *agility contingency budget* for ITPS decisions in between budget cycles. Agile organisations could include *agility contingency* in financial estimates during ITPS. In Infrastructure Co, ITPS processes and decision making is delegated to different organisation layers, based on financial and *maturity* thresholds. Once a project is operating to given standards, ITPS is delegated from the portfolio to the project level. Organisations can follow this technique and balance their desire for centralised control, with their desire for agility.

Contribution

Our research contributes by building on two relevant studies. Firstly, exploratory research by Sweetman and Conboy (2018) suggests that formalised ITPS decision making methods in Project Portfolio Management (PPM), inhibit portfolio agility. So "mechanisms for simple, fast, and collective decision making" should replace conventional formalised methods. But further research is required (Sweetman and Conboy 2018, p. 30). Secondly, Hoffmann et al. (2020) used a singular case study to illustrate how conventional PPM (including ITPS) is problematic for agile organisations. Change is needed, but those changes are also controversial and difficult to implement in practice (Hoffmann et al. 2020).

For agile PPM to seize emergent strategic opportunities, decision-making must be simple, fast and effective (Sweetman and Conboy 2018). ITPS is primarily a decision making activity (Kester et al. 2009). Decision

making in ITPS is therefore an under researched aspect of ITPPM decision making. We address this need in our research, by showing how agile organisations make ITPS decisions. There is a need to connect organisational strategies to agile projects through "project portfolios, programs, PMOs, and other more structured, traditional, and 'external' project governance practices" (Lappi et al. 2018, p. 54). ITPS is one such practice, which we address in this study. By presenting this case study, we address the question of how traditional approaches can connect agile projects to organisational strategy, posed by Lappi et al. (2018, p. 54). And we make initial steps to expand the scope of project governance, to include ITPS – requested by Musawir et al. (2020, p. 13).

Conclusion

Through our literature review and analysis, we have shown that ITPS remains important to agile organisations. And that ITPS has the capability to both enable and disable agility in organisations. This supports the importance of our research question: 'how does an agile organisation undertake ITPS'. To address that question, we identified Infrastructure Co, as an agile organisation which undertakes ITPS. We found that Infrastructure Co does use some elements of conventional ITPS and budget cycles. But to increase their agile capability, they have developed bespoke ITPS governance. We see further opportunities in this line of research. We have described one case in detail, because our research question is new, and the case serves a revelatory purpose. But future research could employ multiple cases, so that a theoretical model might be developed. Quantitative studies may also use our findings to initiate data collection from a large sample, to generate findings that are broadly applicable. It may then also be possible to generalise findings to fields other than ITPS, such as portfolios of non-IT projects.

Acknowledgements

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