Managing Interactive Innovation: From Project Management to Process Mobilization

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Abstract

In this paper we identify a tension between the discourse around managing temporary assignments focused on producing innovative outcomes, that is, the discourse related to projects and project management, and the emerging understanding of innovation processes, as captured by the concept of interactive innovation. Contrasting the project management discourse with what we now understand about innovation processes in practice, especially those that are radical and, or disruptive, provides explanatory power for some of the significant problems and overall high failure rates (as measured, for example, in terms of the triple constraint of time, budget and scope) often associated with these innovation projects. We illustrate this tension between the discourse on projects and project management and the realities of interactive innovation processes with an example from biomedicine. In the discussion we explore why this tension exists, focusing on explanations that consider organizational ambidexterity and situate projects in their broader institutional context.

1. Introduction

It is increasingly recognized that innovation processes, especially in relation to the development of technologies that are radical or disruptive, do not follow the often-assumed linear progress – from basic science to applied research through development to commercialization. Instead, these kinds of innovation processes are better characterized as ‘interactive’ or ‘networked’ [1]. This recognizes that the locus of innovation, often resides in the network of inter-organizational relationships [2]. It also suggests that the temporal features of innovation cannot be predicted because the knowledge evolves in an inherently indeterminate manner [3]. Assumptions of space and time are, therefore, radically different in relation to interactive (as opposed to linear) innovation processes.

While the interactive nature of innovation processes is recognized, there has been less focus on the implications for projects and project management but typically interactive innovation processes are accomplished through project-based forms of organizing. However interactive innovation implies that projects may need to be managed differently. Thus, the mainstream discourse continues to describe projects as planned temporary endeavors that have defined start and end parameters, pre-defined goals and objectives and associated deliverables that need to be met within a pre-agreed budget. In other words, projects are purposefully designed to be constrained by scope, time and budget [4]. These constraints are built into the project plan and the familiar Gantt-chart is produced that summarizes this plan, typically incorporating associated standard methodologies such as the CPM (critical path model) and PERT (programme evaluation review technique). The underlying assumption is, therefore, that it is possible to plan all aspects of a project in advance and use these plans to control the project [5]. The disconnect between such a view of project management and the notion of interactive innovation processes is very obvious [6] [7]. In this paper we explore how our understanding of, and approach to project management, can be revised to accommodate interactive innovation processes. In doing this, we review emerging literature on complex projects that recognizes that conventional PM approaches do not suffice in the face of large, dynamic, non-linear and multi-stakeholder projects [8]. We demonstrate how an interactive innovation lens can contribute to a new discourse and approach to projects and project management. We illustrate the reality of these types of project and the usefulness of this alternative approach with an example of a biomedical research project. In the discussion we offer a number of suggestions as to why project managers responsible
for these types of project continue to prepare, revise
and rely upon traditional approaches to project
management which ultimately is largely self-
defeating.

2. Understanding innovation

The term ‘innovation’ can refer to both the
outcome (the ideas themselves) and the process (how
these ideas emerge). Here we focus largely on the
process – how innovation occurs. Most early
conceptualizations of the process depicted innovation
as a series of linear stages see [9] and Cooper’s stage-
gate model [10]. While this linear view of the
innovation process is well-entrenched and is
reinforced by the project management literature
discussed next, it is now clear that at least some
innovation processes do not neatly follow a linear
sequence of stages. As Boland and Lyttinen [11]
suggest, innovation is increasingly recognized as a
distributed or networked phenomenon, characterized
by messiness, ambiguity and non-linearity. These
authors were exploring the innovation processes
associated with ‘wakes’ of innovation that were
produced in the context of a Gehry construction
project that was using new 3-D imaging technology.
They depict how the diverse communities involved
each developed innovative ideas as a result of the
actions of entrepreneurial actors but that it was the
cross-fertilization across communities, that spurred
innovation ‘wakes’. This cross-fertilization
depended, according to these authors, on the presence
of trading zones that allowed boundaries between
communities to be permeated. Trading zones are
defined as ‘physical and cognitive arenas for
communities with separate innovation trajectories to
negotiate, collaborate, and learn through mutual
perspective-taking and perspective-making’. The
notion of trading zone is particularly helpful in
reinforcing the idea that time and space is needed for
inter-community collaboration that can stimulate
innovative ideas.

The kind of dynamic and volatile innovation
process is also referred to as networked innovation,
characterized by ‘relationships that are negotiated in
an ongoing communicative process and which relies
on neither market nor hierarchical mechanisms of
control’ [12:916]. Rather than a linear sequence of
stages, the innovation process is thus depicted as an
often serendipitous, co-evolutionary process
occurring at the interstices of communities [2] as an
outcome of negotiations over resources, processes
and meanings [13] provided that time and space are
provided for interactions and boundaries between
communities are permeable [14]. Political and
institutional influences will also play a major role in
networked innovation. Moreover, politics, serendipity
and emergence do not suggest processes that can be
tightly managed and controlled, nor processes that
will conform to a predefined timetable.

We have depicted two views of innovation – linear
and non-linear. Incremental innovation is likely to
resemble a linear process while transformative
innovation is likely to resemble a non-linear process
[15]. Not surprisingly, established organizations
typically prefer to engage in less risky incremental
innovation. For example, many established
pharmaceutical companies focus more on developing
what are referred to as ‘me-too’ drugs – drugs that
provide some slight improvement over what exists
already - rather than breakthrough drugs. Instead,
such pharmaceutical companies rely on small biotech
companies to develop more experimental therapies
which they then purchase as Intellectual Property
once human safety has been established in Phase I
trials.

It is therefore interesting to note that at least in the
biomedical sector, it is typically small, start-up
entrepreneurial firms that are most likely to be
involved in non-linear radical or disruptive
innovation projects. Ironically, however these firms
are extremely resource-constrained, particularly
compared to the large global pharmaceutical firms.
Projects are thus managed with a very keen eye to the
future market potential of the therapeutic being
developed and this guides decision-making about
both individual projects and the project portfolio [16].
However while a focus on commercialization is
considered fundamental in managing innovation
projects in some contexts, as we will demonstrate, it
can and does severely distort the decision-making
process. We next consider the discourse surrounding
projects and project management in order to illustrate
the gap between the understanding of innovation
processes discussed in this section and the
approaches currently used to manage these processes
in organizations.

3. Mainstream discourse surrounding
projects and project management

Discourse provides a set of ideas and practices
which condition what is ‘seeable and sayable’ [17].
Following Foucault [18] discourse does not develop
in order to describe some objective aspect of reality.
Rather discourse brings an object into existence [19]
Nevertheless, we often regard these ‘objects’ in a
reified way, treating ‘the products of human activity
as if they were something other than the human
products’ [20:106]. In this way, Linehan and
Kavanagh [21] argue projects are treated ontologically as ‘being’ rather than ‘becoming’, [22]. Being ontologies are representationalist, so that projects are thus defined in terms of structures and plans which can pre-exist any actual activities and which represent how those activities will take place. Project management is therefore, at least, according to mainstream discourse, associated with using project management tools and techniques to create an accurate representation of how the project will unfold and subsequently, using other tools and techniques ensure that this unfolding actually mirrors the project plan.

From a discourse perspective, however, project management is not simply a set of objectively defined best-practice functional tools, techniques and methodologies but is rather ‘a discourse and a technology of power’ [23:170]. Discourse thus ‘disciplines’ through defining practices and the associated tools and techniques that regulate and control activity. Other researchers on innovation have highlighted what they perceive as the necessary disciplining aspects of project plans and techniques [15] [24] in radical innovation projects. However here we challenge this view and specifically examine the current PM discourse in order to analyze the extent to which its disciplining role actually meets the needs of interactive innovation processes.

Mainstream PM discourse largely presents projects as an alternative to bureaucratic forms of organizing. Indeed, while bureaucratic forms are said to be effective for stable situations, projects are considered to be a necessary, ‘new’ form of organizing given the dynamic environments faced in many sectors which require more flexible and versatile forms of work organization. In this way, a project-based form of organizing is contrasted to a bureaucratic form, with projects enabling flexibility in a way that bureaucracies do not. Thus, the Project Management Institute (PMI) in its guide to ‘the project management body of knowledge’ (PMBOK) defines a project as ‘a temporary endeavor undertaken to create a unique product, service, or result’[4:5] reinforcing the idea that projects enable innovation.

In terms of the characteristics of a project, the definition provided by the PMBOK suggests that its two key features are its temporary nature and its focus on creating something unique. These aspects of the definition have remained consistent over time. However, in the 2004 edition, the PMBOK guide actually goes on to describe an additional characteristic - ‘progressive elaboration’. Thus, the guide suggests that project specifications will be elaborated incrementally over time. This is not however, according to the guide, to be confused with ‘scope creep’ in that the actual work to be done must be predefined in order to ensure that the project can be calculable. As Thomas reflects ‘this addition to the definition appears to be almost an afterthought that does not appear to influence the rest of the material in the PMBOK guide’ [23:92]. Instead, the bulk of the PMBOK guide is focused on presenting tools and techniques that will enable the accurate planning and control of projects. Such a focus stems from its engineering roots and fits with mainstream management discourse in general, which is concerned with defining how to make activities undertaken in work more predictable and controllable through the use of objective, quantitative techniques that are based on an instrumental rationality [25].

In terms of these techniques, following from this definition of a project, the guide goes on to define project management as ‘the application of knowledge, skills, tools and techniques to project activities to meet project requirements’ [4:8]. These tools and techniques are applied to the project management processes of initiating, planning, executing, monitoring and controlling, and closing. Thus, managing a project involves a series of phases: identifying requirements, establishing clear and achievable objectives, and balancing the ‘triple constraint’ of scope, time and cost in the execution of these objectives. Again, in the description of these processes, the guidebook now adds a fourth dimension – ‘adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders’, but again this adaptation needs to be made upfront to ensure that the evils of ‘scope creep’ do not manifest over time.

These relatively minor changes in the PMBOK do reflect a slight shift in the PM discourse. Thus, while early project management prescriptions focused on the technical aspects of management, more recent developments have included the human aspects. Nevertheless, these more ‘intangible’ elements are still treated as if they can be controlled in order to ensure predictability [17]. For example, critical success factors have been identified that supposedly help to ensure that the agents engaged in projects remain committed and act consistently in fulfilling the tasks that they have been assigned. So, aside from the technical control tools such as PERT that are to be used, the guidebook highlights that it is also important to have for example, top management support so that project teams will recognize the value of what they are doing and so focus their efforts on achieving the objectives.

While considerable energy has gone into defining prescriptions for effective project management, Cicmil and Hodgson nevertheless conclude: ‘There is
little evidence that the resulting torrent of competing streams of thought, methods of enquiry and best-practice claims and propositions has creatively contributed either to constructive debate in the field or to resolving the difficulties encountered in practice" [26:2]. Indeed, in terms of practice, evidence suggests that despite the growth of sophisticated methodologies, only very basic approaches are actually used in practice and then not even as intended [27]. Thomas goes as far as to say that the mainstream PM literature is best described as ‘head in the sand’, promoting an idealized concept of projects and PM, at the expense of ‘the lived experience of projects’. Nevertheless, the PM discourse disciplines work and workers [24] even while it fails very often to achieve its objectives. Indeed, it is largely the attempt to discipline work which is inherently indeterminate that creates many of the problems in practice.

If we unpack the discourse surrounding mainstream approaches to project management it is, therefore, arguably very similar to the bureaucracy discourse in the sense of relying on mechanistic control and discipline. Thus, the tools, techniques and methodologies that have been developed purport to ensure that projects will be delivered on-time, on-budget and in-scope, providing of course that the tools, techniques and methodologies are ‘correctly’ utilized. This led Townley to describe mainstream project management prescriptions as ‘a series of carefully delineated steps, executed in sequential order: optimal decisions are made by careful planning and rational logic’ [17:564]. The assumption is that progress on a project will occur in a pre-defined, linear way and tasks can be divided into small, measurable units that can be closely monitored, reminiscent of a Scientific Management approach to work. As Thomas concludes ‘PM does not resolve the issues surrounding the dysfunctional aspects of bureaucracies; it merely changes the scale of the operation’ [23:103].

We can summarize many of the problems associated with the existing PM discourse specifically in relation to the temporal and spatial aspects of projects. In terms of temporal features of projects, projects are often defined in terms of increasing flexibility. However, this flexibility relates to setting up a project to do something different; it does not refer to the flexibility required temporally to actually accomplish ‘something different’. Instead, as we have seen, mainstream PM is essentially about pre-defining and controlling the time taken for activities needed to accomplish this something different so that outcomes are predictable. In this way, project management, rather than increasing flexibility through the application of PM methodologies builds in rigidity in a way that is antithetical to the needs of interactive innovation. Moreover, the division of activities into distinct temporary projects may make it difficult to think strategically about the consequences of decisions that are taken in the present in relation to the longer-term, with the risk that projects will be just ‘become ‘isolated sequences of action lacking any meaningful links to both the context and the future’ [28:113].

In terms of the spatial features, while PM methodologies do increase horizontal communication and coordination within the confines of the project, they also separate the project from the rest of the organization and so create what Thomas refers to as ‘blinders’ rather than the openness that is needed for interactive innovation: PM ‘concepts and standards based in linear, rational, controlled systems provide a certainty which eliminates ambiguity and makes us comfortable’. This desire ‘to be comfortable’ leads us away from uncertain, uncomfortable, double-loop learning processes that allow us to deal with complex adaptive systems operating on the edge of chaos’ [23:103]. Thus, rather than PM providing knowledge and tools to manage these complex processes, mainstream PM discourse attempts to reduce the complexity by ignoring it.

Mainstream PM discourse therefore, asserts that projects can be planned up-front as a series of activities that will be undertaken in a particular sequence and timing. Interdependencies between activities are acknowledged but the assumption is that these can still be included in the planning mix.

Conversely interactive innovation is characterized by complex interdependencies across activities, which in some instances are almost impossible to preplan sequentially ahead because by definition the results of at least some activities are not able to be predicted (accurately at least) in advance. This can occur because, where disruptive or radical innovations are being developed, there is likely to be resistance that is encountered along the way which must be accommodated [29] through negotiations which emerge in real time [30]. Having highlighted the gap between mainstream PM discourse and interactive innovation processes, in the next section we discuss an alternative discourse that may better accommodate the characteristics of interactive innovation processes.

4. Alternative discourses

Mainstream PM discourse assumes that the only way to accomplish work is to structure and control both work and workers. This ignores how 'normally
competent persons’ in ‘ordinary situations’ can generally sort things out [31:186]. A becoming ontology [22] emphasizes process and continuous and emergent construction of ongoing practices in ways that are dynamic and unpredictable. This emphasis is on negotiated, ongoing construction rather than representation. This contrast was represented by Watson [32] as the difference between a system control paradigm and a processual paradigm. Table 1 presents the features of this alternative discourse as applied to managing interactive innovation projects contrasted with the ‘Mainstream discourse’.

The alternative discourse depicted in Table 1 is associated with the critical management studies scholarship: (http://aom.pace.edu/cms/About/Manifesto.htm) that calls for a shift in our ways of thinking and talking about business and management. As Willmott describes, critical management studies involves a very loose network of individuals who are variously engaged in developing ‘alternative frameworks and vocabularies for making sense of the complexities and contradictions of contemporary work organization’ by problematizing current canonical forms of ‘doing and representing ‘management’ [33:36]. While much critical management studies research focuses on emancipatory objectives related to alternative representations of management, the broader agenda could be described as being concerned with how the current obsessive focus on narrow, short-term profits in many organizations (and hence many projects) often contradicts the organizational ability to achieve broader and more long-term goals, such as the development of radical medicines that can improve quality of life (while also potentially, at the same time, generating profit for the companies involved). This is very much the spirit of the alternative discourse presented here. The Process Mobilization alternative discourse presented in Table 1 provides a framework for thinking and doing, what we currently refer to as projects, differently. This alternative framework avoids rigid planning and tight control that can impede interactive innovation in favor of providing an enabling context in which ‘wakes of innovation’ can be stimulated as ideas collide and diffract in new ways to stimulate breakthroughs and solve problems that could not be planned for in advance.

In practice, research has demonstrated that often the alternative discourse we present here actually underpins and better represents project working in many sectors such as construction, biomedicine, IT and education, even though this is typically overlaid with mainstream PM discourse [34]. The result is that in many projects there is a continuous tension and misalignment between the messy reality of project interactivity and the rhetoric embedded in PM plans. Inevitably, the plans have to be continuously revised to take into account events that have occurred that were unpredictable and/or unforeseen. In the next section we illustrate this tension between PM rhetoric and the process mobilization that occurs in practice by providing an illustrative case from a project within a UK biomedical company. Biomedical companies are considered to be archetypal examples of where networked or interactive innovation will take place [2] [16]. We have selected this case from a larger research project, which studied progress across 11 biomedical research projects in the UK and US over a 30 month period between 2005 and 2007. This case illustrates many of the problems and practices that occurred across the projects in our sample.

5. Biomedical innovation in BIOTECH

BIOTECH is a biopharmaceutical company which develops human monoclonal antibody therapeutics. BIOTECH’s expertise predominantly lies in early stage/preclinical development. The project that we observed over a 21 month period between 2006 and 2007 - BIOTECH 123 – was a project aimed at developing a radical new treatment for tackling an acute respiratory disease which affects significant proportions of Western populations. As such, the drug had the potential to become a ‘blockbuster’. We began observing the project when the drug had entered Phase I trials to test safety and efficacy on small populations. If these trials were successful then BIOTECH would be in a strong position to partner with a pharmaceutical firm who would have the necessary resources to take the drug through to commercialization. In June 2006 the results, of a Phase I trial demonstrated that the drug was well tolerated at all doses and no safety concerns were identified. With the success of this trial, senior management decided to continue development in-house and invest in a further Phase I trial and a Phase II trial, whilst simultaneously looking to identify a pharmaceutical firm to partner with.

A clinical research team was assembled consisting of one representative from each of the core functions that would be involved e.g. manufacturing, scientific development, clinical research, regulatory etc. This group was responsible for designing and managing the clinical trials and liaising closely with the business development team who were going to negotiate a deal with a partner. The clinical research team drew up a detailed project schedule for the next 15 months for the Phase I and II trials, planned in
days and weeks, which estimated and scheduled the resources that would be required and the costs involved. If there were problems encountered with the second Phase I trial then the Phase II trial would be delayed. However at the outset this situation was not envisaged or planned for. The 15 month timeframe was decided upon on the basis that this was thought to be the amount of time required to set up the partnering deal, at which point the project would be handed over to the partner. Project team meetings were scheduled for every second and fourth Tuesday in each of the following 15 months.

The team developed the protocol for the second Phase I trial and was given regulatory approval. However, after two months the clinical research team had not been able to convince clinicians to enroll patients in this trial. Whilst the trial design would have in principal, generated potentially very good data regarding the efficacy of the product, in practice, clinicians were not prepared to involve their patients in what they considered to be a fairly high risk trial.

At this point, recognizing that the project was now behind schedule, the project manager suggested that the team abandon this Phase I trial and move straight into designing a Phase II trial. This trial was designed over the next four weeks and planned to run in the first quarter of 2007 with 3 dose groups containing 12 patients per group and a placebo group with a further 12 patients. BIOTECH successfully contracted a local specialist unit in a hospital to recruit patients and run these trials. However, at a project meeting in December 2006 the team revisited their decision to enroll 48 patients. BIOTECH was experiencing some financial pressures and the project manager had been asked by senior executives to see if costs could be reduced. However, it was unclear from the business development group’s feedback regarding ongoing negotiations with potential partners whether they were looking for results from a larger population. The clinical team spent a significant amount of their time in two project meetings largely guessing what potential partners might be looking for. This was made more difficult by the fact that all potential partners had come up with different plans for taking the project forward. As the project team leader commented “you might as well stick your finger in the air as to how many patients we need”. This doubt over patient numbers possibly reflected BIOTECH’s lack of experience of designing Phase II clinical trials. However, equally it was felt that potential partners did not seem to have a clear idea around trial design for this drug, even though these were much larger pharmaceutical companies. Finally the project manager decided that despite budget constraints “it’s our guess against their guess, so let’s stick with 48 – it’s the answer to everything isn’t it?”

In order to conduct this trial the therapeutic needed to be suspended in a solution, then bagged and labeled for each patient, to be administered intravenously. In principal the suspension was going to be bagged by BIOTECH and then delivered to the hospital where patient labels would be added. To the surprise of most of the team, the regulatory expert highlighted that this constituted an amendment to the manufacturing process for which FDA approval was needed. This was therefore going to cause delays. It also came to light that whilst the majority of trials units in hospitals are exempt from the need to have a license to carry out labeling processes, this particular hospital was not exempt! This again was discovered quite late in the day and the clinical trials manager felt that manufacturing should have made the team aware of this requirement much sooner. BIOTECH therefore needed to find a licensed facility that could add the labels to the bags in transit to the hospital.

A firm was eventually found however when the labeled bags were returned to BIOTECH for inspection, particles were discovered in the suspension. No-one on the team had any idea why this had occurred. BIOTECH’s basic scientists were called in to try and solve the problem. By April 2007 the chemists could still not agree on what might be causing the problem. The clinical trials team was very keen to establish this as soon as possible, but the same sense of urgency was not manifest in the basic scientists who more typically worked to much looser deadlines. At the time our research ended at BIOTECH the trial was way behind schedule and the business development team announced that they were just weeks away from confirming who the partner would be on this project. It was left to the project manager to inform senior management about the problems on the project recognizing that disclosure of the problems could jeopardize the whole deal.

The BIOTECH case clearly demonstrates the limits of traditional PM techniques in dealing with complex, interactive projects. Whilst BIOTECH were optimistic at the outset that future development was feasible based on the knowledge derived from the first trial, in practice many of the problems that emerged were unknowable in advance. For example, whilst the second Phase I trial was approved by the regulator, in practice clinicians believed the trial was too risky and refused to participate. The emergence of particles in larger quantities of the therapeutic was also a complete scientific mystery. Throughout the process, Gantt charts and project plans were referred to and constantly revised as delays were incurred, re-scheduling tasks in micro times of days and weeks.
The twice-monthly project meetings became increasingly evaluative meetings and often led to the apportionment of blame to particular functions. In practice problems emerged which could not be resolved internally within the project team. The clear demarcation of tasks both within the team and across the organization led to numerous co-ordination and communication problems. For example, the demarcation of tasks across the business development team and the clinical team led to severe problems around trial design with the project team attempting to second guess what partners’ future plans might be. There was no attempt to create a trading zone in which potential partners and the project team could jointly agree upon a suitable trial design as the partnering process was considered too politically sensitive.

The problems highlighted in this project are not untypical and demonstrate the need for a more nuanced, reflexive approach to PM. An alternative approach would firstly need to acknowledge that much of what occurs is unknowable in advance such that deadlines are somewhat arbitrary. Secondly it would need to make transparent the inter-dependencies that exist such that communication channels are established from the outset across all parties that are, or could be implicated in the project. Thirdly it would need to establish a set of loose processes which could be mobilized as and when problems arise so that they could be acted upon by the most appropriate parties, in a timely (not timed) manner, regardless of formal demarcations etc.

6. Discussion

The case has illustrated the misalignment between mainstream PM discourse and the practices that occur in interactive innovation projects. The process mobilization reality indicates more ambiguous and open-ended practices than the PM discourse assumes.

This paradox between the discourse that continues to be used to manage projects and the reality of their inherent interactivity that undermines this management attempt suggests that we need to look beyond projects themselves to understand why managers choose not to at least attempt to resolve this tension in practicable ways. Explanations for this paradox can be traced to dynamics both within organizations themselves and to the broader institutional context. In terms of the internal dynamics, while our case data provides many illustrations of how ‘things did not go to plan’, the plan itself can still have a disciplinary power (Townley, 2002, Thomas, 2006) over members of the project team, encouraging or coercing them to ‘work all hours available’, regardless of the disruptive impact on personal lives, in order to try and get the project back on track. For example, in the biomedical project described above, when problems were identified which meant that activities were going to take longer to complete than anticipated, this not only led to some readjustment to the plan, but more importantly was used to pressure project members to work their weekends, return prematurely from holidays, miss family events etc.

This disciplining effect of PM discourse can be linked to the organizational ambidexterity that often firms operating in sectors such as biomedicine have to develop. There are few firms that can survive strategically by engaging solely in the development of radical innovations. Instead they also need to exploit existing knowledge in new ways in order to incrementally innovate which is far less risky and helps sustain cash flows and profit. Processes and routines therefore have to be developed that can sustain exploitation and exploration simultaneously. Recent research has demonstrated that ‘innovation paradoxes’ emerge in these types of firms whereby routines and activities need to be developed which will enable both steady profit streams and breakthrough products or services; leverage current and perhaps largely unidentified customer needs; and finally provide the conditions whereby workers can channel their creativity whilst simultaneously operating according to well defined development processes that serve to discipline work [24].

In a similar vein and specifically in relation to radical innovation projects, Sheremata suggests that temporal pacing through project plans and milestones acts as a centripetal force “integrating ideas, knowledge, and information into collective action” [15:390] and moderately flexible milestones need to be adhered to in order to increase the likelihood that solutions to problems will be found in a timely fashion. Sheremata’s framework focuses on what she perceives are the tradeoffs that always have to be made in such radical projects: If the centripetal forces that aim to integrate a project are excessive and do not match the centrifugal forces that aim to increase the quantity and quality of ideas, knowledge and information an organization can access in magnitude, then the likely outcome is ‘contained failure’. This would be characterized as projects that have not made sufficiently fast progress or have become increasingly costly over time, according to the pre-defined project plans and milestones, so that decisions are taken quickly to terminate them. Thus Sheremata’s framework adheres to the mainstream PM discourse and assumes that predefined plans are a useful tool for terminating a project at the
‘appropriate’ time. In practice however, management’s ability to accurately assess whether these forces are of equal magnitude is highly unlikely given the complex inter-dependences and dynamism inherent within these projects. This again supports the idea that an alternative discourse and approach is required for these types of projects that can provide significant flexibility around a set of processes that can be mobilized as and when problems arise.

Another important factor influencing the continued use of PM discourse relates to the broader institutional context. As observed earlier, much of the more radical and disruptive innovation in biomedicine (and in other sectors such as IT and the creative industries) takes place in small, often start-up entrepreneurial firms. Such firms are typically extremely resource-constrained, needing to continuously search for venture capital or grants [16]. They are unlikely to be successful in this search if they cannot provide convincing accounts of their management of innovation. These firms trade in valuable intellectual property that increases in value as the therapeutic is successful in clinical trials. While this can never be known in advance, the project plan has an important external legitimizing role, serving to convince investors of the ability of the firm to manage their project portfolio. Indeed, this legitimizing role can also be important within the organization itself since project leaders will also be vying for resources internally. Here also, a project may be more successful at acquiring resources if a defined timetable is established than if the inherent indeterminacy of an interactive innovation process is admitted.

In conclusion, in this paper we identify a paradox – that the current discourse surrounding so-called flexible forms of organizing i.e. projects and project management is misaligned with the creativity and innovation practices that are supposedly the hallmark of these flexible forms of organizing. If everything around the innovation process is known and thus planned for in advance it is unlikely to lead to breakthrough innovations! We have reviewed the literature and provided an example of the current project management discourse and in doing this we have illustrated this paradox. This led us to present ‘project management’ and ‘process mobilization’ as exemplars of the rhetoric and the reality of many radical innovation projects. We have argued that the process mobilization view of organizing is more aligned to the needs and reality of interactive innovation processes but have also shown that PM discourse continues to be prevalent. In our discussion we reflect on why this paradox exists, linking this to both the internal disciplining power of the PM discourse and its external legitimizing role.

In this sense then, project management and process mobilization are not alternative discourses but rather are likely to co-exist, with the inevitable and constant tension between the plan and the practice (the rhetoric and the reality) being the outcome of this misalignment. This suggests a possible extension to the idea of organizational ambidexterity [30] that indicates that organizations should have a mix of incremental and radical projects that are managed differently. Our analysis, also suggests that there may be another way in which organizations attempt to demonstrate their ambidexterity: they promote to the outside world a vision of projects that are planned and controlled while in fact they face a constant struggle internally to gain this control, at least within the originally specified deadlines. The result is that most radical projects do not meet the ‘triple constraint’ of being on-time, on-budget and on-scope, but if the originally specifications enable them to acquire funding then this is the approach they will adopt and in this sense they demonstrate ambidexterity.

References


**Table 1: Alternative Discourses on Project Management**

<table>
<thead>
<tr>
<th>Innovation</th>
<th>Current Discourse</th>
<th>Alternative Discourse</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Knowledge</strong></td>
<td>Knowledge as possession: known in advance and integrated within team</td>
<td>Knowledge as practice: unknowable in advance and emergent at interstices of communities</td>
</tr>
<tr>
<td><strong>Project Management</strong></td>
<td>Projects managed using tools and techniques which enable projects to be delivered on-time, on-budget and in-scope</td>
<td><em>Processes are mobilized</em> so that sociomaterial assemblages are facilitated that can afford radical innovations</td>
</tr>
<tr>
<td><strong>Goals and objectives</strong></td>
<td>Predefined. Statement of work defines the scope of the project and should not be allowed to ‘creep’</td>
<td>Goals articulated but affordance recognized and encouraged</td>
</tr>
<tr>
<td><strong>Tasks</strong></td>
<td>Project broken down into series of activities referred to as a work breakdown schedule, each of which is subdivided into work packages that can be specified in terms of required resources and time (largely based on rules of thumb)</td>
<td>Tasks not readily pre-defined since what needs to be done not all recognized at outset; tasks added as needed</td>
</tr>
<tr>
<td><strong>Scheduling</strong></td>
<td>Milestones and critical paths defined using techniques such as PERT and CPM – so a detailed timetable is produced</td>
<td>Milestones may be used but for reflection and (re)orientation rather to predict when things will be completed</td>
</tr>
<tr>
<td><strong>Monitoring and Control</strong></td>
<td>Regular time-reporting system initiated so that progress is examined against timetable. A ‘structured walk through’ and ‘red flag raising’ are used to identify variances from the plan and these must be explicitly justified and accounted for (blamed!)</td>
<td>Reporting recognized to sometimes impede progress so that reviews are developmental rather than evaluative</td>
</tr>
<tr>
<td><strong>Temporal features of change</strong></td>
<td>Planned, finite duration, milestones, deadlines</td>
<td>Emergent, post implementation, extended co-ordination</td>
</tr>
<tr>
<td><strong>Spatial features of change</strong></td>
<td>Clear goals, separated/ liminal project team(s) within organization, clear demarcation of tasks across different individuals/groups</td>
<td>Ambiguous goals, multiple interdependencies across organization and beyond, ‘trading zones’ which facilitate emergent ideas across individuals/groups</td>
</tr>
</tbody>
</table>