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Towards a research agenda for adopting Agile Project Management in Creative Industries

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ABSTRACT

Agile Project Management (APM) has gained strong acceptance in software development but its adoption in other industries has not been as swift. We look at the visual effects (VFX) component of the film industry to explore this issue. Using an abductive research approach combined with a survey of existing practices, we aim to investigate an industry whose projects are large, expensive and time critical. Our study hopes to show that VFX companies exhibit many characteristics conducive to APM adoption but it is only within their internal software development teams that they explicitly state their use of APM. We explore why these companies, who exhibit predisposed adoption characteristics use something other than Agile for their non-software related projects. In exploring this surprising position, we hope to gain insights into how other industries may adopt APM and to set a research agenda for APM in non-software development creative companies.

Keywords

Agile Project Management (APM), Visual Effects (VFX), Film Industry

INTRODUCTION

Agile methodologies emerged as a result of continued pressure for radical change to the traditional approach of software development where the eventual delivery of systems, after several years were no longer appropriate (Fitzgerald 1998). Projects were still over budget and behind schedule in far too many cases and Information Systems Development (ISD) saw alternatives from experienced practitioners who labelled their methods as 'agile software development' (Dybå and Dingsøyr 2008). Agility indicates that the project is iterative and evolutionary during development, planning and delivery to allow for rapid and flexible response to change (Batra et al. 2010). Agile Project Management (APM) is continuing to gain momentum in the global software development industry. The annual State of Agile survey for 2015 indicates that 94% of organisations surveyed are practicing agile (VersionOne 2015), compared with 84% in 2012. Based on the Agile Manifesto (Beck et al. 2001), APM attempts to adapt processes in order to improve effectiveness in an ever-changing business environment while still maintaining structure and organisation to ensure effective control over the execution and delivery of projects (Cobb 2012). Many practitioners and researchers are keen to explore the adoption of Agile principles (Beck et al. 2001) in industries beyond software development because they are perceived as the dominant, competitive vehicle for all organisations in an uncertain, ever-changing business environment (Tseng and Lin 2011). Application of these approaches seems a natural extension, especially in industries where the nature of the work, together with size, scope and time-scales are similar. To date however, the primary focus of APM-application has been in the software industry with a lack of empirical studies in other types of industries or projects (Conforto, E.C; Salum, F.; Amaral, D.C; da Silva, S.L; de Almeida 2014).

The Project Management Body of Knowledge (Project Management Institute 2013), defines project management as the application of knowledge, skills, tools and techniques to project activities in order to meet the triple constraint of scope, time and cost. Determining success or failure in a project often centres on how it addresses this triple constraint. In the visual effects (VFX) industry, the sheer weight of marketing money deployed to open a major film means that moving the delivery date (film's premiere) is rarely an option. With scope open to creative interpretation and hundreds of millions of dollars invested in major feature films each year, the VFX industry is an under-researched and yet informative industry to learn from and examine in the context of APM. Our initial field research indicates that this industry appears as a prime candidate for such expansion. The projects are large, expensive and time critical in a very public sense. The VFX industry consists mainly of large companies with the majority of

creative production staff using non-APM approaches, often simultaneously with smaller internal software development teams (openly and explicitly) using APM. The question therefore remains as to why VFX companies; exhibiting the adoption characteristics predisposed to APM, use something other than agile for their other projects (including their creative production efforts) particularly when it is within the same companies concurrently working on the same projects in much the same way. We explore (a) whether the industry is altering their project approaches in some way that is considered most suitable for creative project efforts and (b) the possibility of theorising the nature of what our study reveals to help inform a research agenda into the broader issues of APM adoption in industries other than software development, who may share characteristics similar to that of the creative industry space.

Conforto et al. (2014) posed the question: “*Would it be possible to identify the use of APM practices and the presence of enablers in companies recognized to be users of the traditional project management approach from different industry sectors that do not formally adopt or recognize the use of APM theory?*” Using their system of ‘enablers’ we investigate if the organizational environment in the VFX industry is favourable for adopting an APM approach. We then seek to use an abductive research approach with a case study to investigate this unexpected lack of direct adoption of APM. This is a reflective approach based on the iterative abductive method of Peirce (Aguayo 2011). Despite the high profile nature of the projects, limited prior research with regard to project management in the film industry exists. This paper first presents a brief contextual exploration of the role of VFX in the film-making process. We then proceed by examining literature for models asserting the industry’s receptiveness to APM and subsequently apply this to the VFX film industry. We present a single, relevant exemplar case, which has adopted an APM approach that provides insights into the issues and challenges faced with such direct adoption in the creative industry. This is one of the first research studies to present such a case and investigate the deployment of APM in the film industry. We subsequently formulate a research agenda for applying APM (or some version of it), to non-software development endeavours, especially those pertaining to creative work.

CONTEXT: BACKGROUND ON THE FILM INDUSTRY AND THE ROLE OF VFX

The film industry requires formal and well applied project management discipline to meet the critical premiere dates with the delivery of creative, innovative content generated by (often) hundreds of people working collaboratively. The reality of film production is somewhat different to its perception. While much media attention is on filming the actors, there is much more labour and time spent in the period after principle filming is completed, known as post-production. For example, it is not uncommon for a lead actor or actress to shoot principle photography for 10 to 12 weeks, while the VFX team are employed for months or years. For example, for the film *Captain America: Civil War* (2016) principle photography was for 166 days and the post-production effects period, (excluding any overlap with principle photography), was an additional 249 days. In terms of the film’s credits, *Civil War* lists 185 actors credited compared to 980 visual effects artists (via industry database IMDBPro.com).

SCHEDULING A VFX PROJECT

Major feature films, especially large visual effects films, are creative challenges undertaken with serious time constraints, inflexible delivery deadlines and only a partially defined scope as they are often attempting to depict something ‘no one has ever seen before’. The need to follow a part-science, part-art approach means budgets are vast, often exceeding \$100 million and the return on success even larger with major films breaking over \$1 billion in gross revenue. In this environment of unexplored creative storytelling, a waterfall project management approach is unsuitable, as overlapping requirements dovetail with visual development and an evolving film. As such, the film industry and its VFX section has struggled to find an approach to facilitate producing vast amounts of shots, with ill-defined deliverables and budgets in the tens of millions (Seymour 2014). A VFX project can translate to thousands of Information Systems (IS) creative team members on extremely tight and inflexible delivery deadlines distributed around the world from Beijing to Berlin.

Despite this, Persse (2008) outlined a project management ‘sequence’ that represents the ‘Hollywood system’ as encompassing development, preproduction, production, post-production and wrap-up. According to Persse, this concurs to the same general order of a traditional waterfall model in software development projects. While these activities do occur, our research indicates that they are not sequential. A modern film is not an ordered process of pre-production, filming and post-production. For a film to get a ‘green light’ before a script is even finished, a sequence may be made and visual effects work done either in a crude ‘rough’ animation format or in a final polished form. For example, before the film ‘Godzilla’ was finished being written or officially given the green light, 8 shots

were taken to final quality providing a ‘teaser’ clip shown at the convention Comic-con. This sequence was never included in the film but it did generate sufficient interest in that the film was subsequently put into production and the Comic-con reel was used as a visual-style reference for the completed film (Failes 2014). Thus, in this case, it could be argued that post-production finished shots were completed before film writing was even done. Such examples highlight the non-sequential nature of VFX. Despite the absence of direct use of APM terminology within the sector, there remains a research gap in investigating their inherently adaptive project processes and whether the industry has adopted its own variation of APM over many years.

EXISTING LITERATURE: PREDISPOSITION OF VFX TO AN APM APPROACH

There have been several key works on the adoption of APM outside the software development industry (e.g. Cole and Scotcher 2015; Gonzalez 2014; Hodgson and Briand 2013; Nicholls et al. 2015; Paquette and Frankl 2016; Stare 2014). In the creative industry space, Hodgson and Briand (2013) explores video game development and describes how, similar to the film industry, the majority of work is project-based and highly conducive to “post-bureaucratic methods” which offer more flexible, empowering alternatives. The managerial challenge “lies in the integration of artistic and technical creativity and in negotiating the complex relationships between management, art and technology.” They found in this related yet separate Games industry that despite the deployment of an agile methodology (i.e. Scrum), projects were undermined by regular interventions from senior management.

Research conducted by Conforto et al. (2014) is considered most relevant to our study. They surveyed the use of project management in 19 medium-to-large sized companies from different industries, to produce a methodology for pre-conditions or existing factors that are needed for APM appropriateness. They performed a comparison among project management practices “from the traditional literature and the agile management approach literature in order to identify which actions, tools, and techniques were clearly different according to the two approaches”. Their research identified enablers indicative of opportunities for APM adoption.

Based on a systematic literature review, Almeida, Conforto, Silva and Amaral (2012) presented 41 enablers which were categorized into four areas: Organisation, Process, Project Team and Project Type. Of these 41, Conforto et al. (2014) elected 10 enablers that appeared most frequently.

1. Organizational structure type.
2. Multi-disciplinary project teams
3. New product development process formalization
4. Customer/Stakeholder involvement in the product development process
5. Supplier or partner involvement in the product development process
6. Project team member’s experience
7. Project manager experience
8. Project team size
9. Project team dedication
10. Project team location

Using these 10 extensively identified enablers to inform our study, Table 1 provides a summary of the primary differences and similarities between APM and VFX project management. It is our intent to build a research agenda around these, informed directly by quantitative and qualitative case study research discussed in the next section.

Enablers	Typical Agile Characteristics	Typical Film industry - VFX (Seymour 2015)
1. Organizational structure type	Matrix structure of cross functional teams with multiple reporting hierarchies	VFX crews are cross functional with teams based on scene or shot not job function.
2. Multi-disciplinary project teams (various competences)	Cross-functional small groups, with a separate management responsibility to the team group.	Cross-functional teams with separate reporting structures for creative and managerial (producing). Perhaps more than even in software development the producer-VFX supervisor relationship is a daily and often hourly interaction

3. New product development process formalization	Standardized process for new product development. Agile has a formality and can be audited for compliance to known approaches.	VFX are very much a process without standardization other than common practice. VFX pipelines are not audited.
4. Stakeholder involvement in the product development process	In the same room, and influence, involved in all project phases and project orientated	Accurate breaking down of the tasks to small enough units for accurate shot design, estimation and scheduling
5. Partner involvement in the product development process	Partners involved from conceptual stage of planning	Open to shot changes, re-edits due to internal and external (audience testing)
6. Project team member's experience (in years)	Over 2-3 years preferable over 4 years of experience	Same metric can be used.
7. Project manager's experience (in years)	Over 2-3 years preferable over 4 years prior relevant PM experience	Same metric can be used.
8. Project team size	Team's of typically 5 to 8 people	Same metric can be used.
9. Project team dedication (time dedicated exclusively for the project)	The majority of the teams time (75%+) on the project, preferably >90% of their time.	Same metric can be used.
10. Project team location	Co-located.	Same metric can be used.

Table 1: Interpreting Enablers into a VFX context

This list of enablers can be complimented by examining characteristics of common APM implementation. Whereas this list signals an opportunity or readiness to adopt APM, we seek to also look for *existing*, adopted APM style approaches within the VFX industry.

AN ABDUCTIVE RESEARCH APPROACH: CASE STUDY BACKGROUND

Ensuring rigour is a primary concern in research. We therefore outline our research methodology and the performative nature of the research in exploring APM in the VFX industry. We use a reflective method or abductive methodology for our case research (Aguayo 2011) which is an iterative process of considering qualitative case data and theory, referred to as ‘systematic combining’. This is not just an inductive and deductive mix, but an iterative abductive method (Dubois and Gadde 2014). We believe a qualitative approach provides the best methodological stance for several reasons. Firstly, we are investigating an absence of adoption. After much investigation via professional associations, conferences and closed professional large scale email groups, only one significant long-term (5 years+) direct adopter of APM has been found in this industry. This one case study provides a rich source of “knowledgeable agents” on the various issues as to why adoption is complex and “when the problem is directed toward analysis of a number of interdependent variables in complex structures the natural choice would be to go deeper into one case instead of increasing the number of cases” (Dubois and Gadde 2002, pg.558). Secondly, while we are proposing a research agenda, and to build a clear view of the apparent contradiction (namely, the seeming appropriate conditions for APM adoption without wide-scale acceptance), we do not have a preconceived hypothesis to test against, as there is a significant gap in literature researching project management in the film industry (and

more significantly, in VFX). Finally, an alternate approach of grounded theory was considered and rejected as it denied the perspective of our initial research approach of seeming applicability and appropriateness for APM. Abductive research involves the “systematic combining” (Dubois and Gadde 2002, 2014) of inductive and deductive approaches, and is therefore different from grounded theory (Corley 2015), which aims to find truth “in” the data itself without any particular theory guiding the analysis (Hafermalz and Riemer 2016).

We start with a discovery that surprisingly, the project management of large-scale commercial VFX films share many characteristics of APM yet very few companies explicitly adopt APM. Firstly establishing how projects are currently run in the industry and then based on prior literature (for APM compatibility in non-software related project environments), we assess the VFX industry. We then examine a specific case for the illumination it casts on the theoretical model of adoption in this specific industry. From this, we hope to gain insight into more generalized adoption perspectives. This research does not depend on large-scale empirical data, but on theoretical generalizing from in-depth iterative analysis of aspects of the case relevant to the phenomenon. Through this iterative process of working with the case material and theory, we gain cumulative insight into the theory, which then reflects a better understanding of what we are observing in our data. We intend to develop this research further by conducting:

- A formal survey of VFX companies around the world, based on the Conforto et al. (2014)’s enablers and range of points (outlined previously in Table 1) We seek to move from an anecdotal assessment of the receptiveness of the VFX industry to an empirical evaluation.
- An abductive case study of Cinnamon VFX using APM characteristics (outlined in Table 2 below).

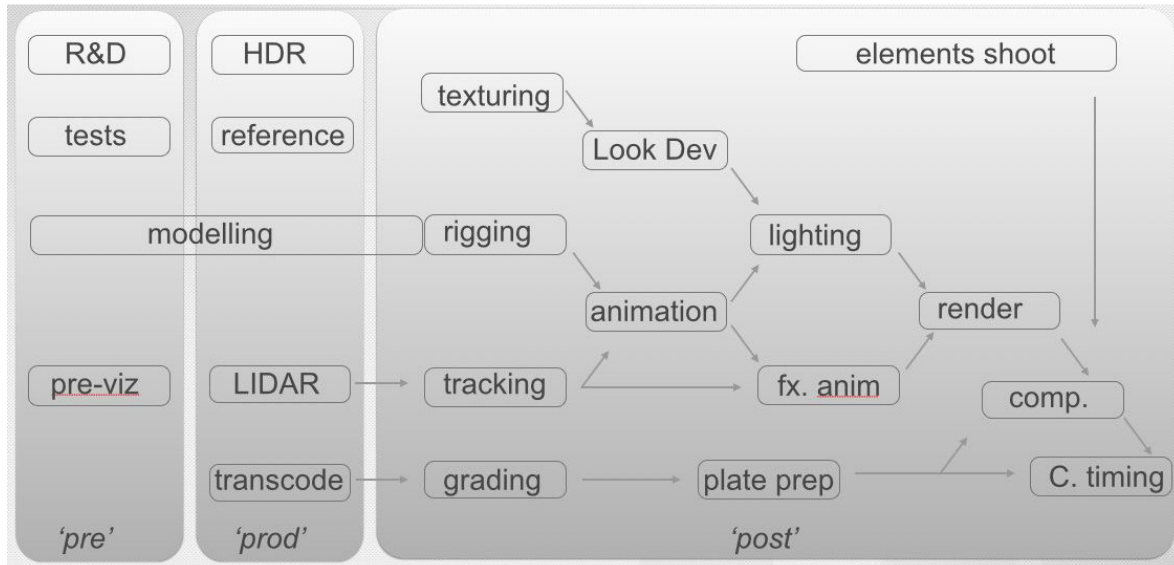
For the latter, case studies are strongly associated with qualitative research as they “allow for the generation of multiple perspectives either through multiple data collection methods or through the creation of multiple accounts from a single method” which can yield detailed understanding of a specific context (Gray 2009) which is entirely relevant for this research. The case study will derive meaning from events (such as project management practices deployed in Cinnamon VFX) and develop knowledge in this domain where prior research is very limited.

PRELIMINARY FINDINGS

Based on our initial findings, the traditional waterfall model of pre-production leading to production and then post production with discrete technical and creative stages finishing before the next task is started is not at all an accurate representation (Figure 1).

Typical technical scheduling workflow:

Pre-production to Production to Post-production with a waterfall style model



Modern technical scheduling workflow:

Characterised by overlapping technical activities. One activity is not completed before the next is commenced, boundaries are flexible.

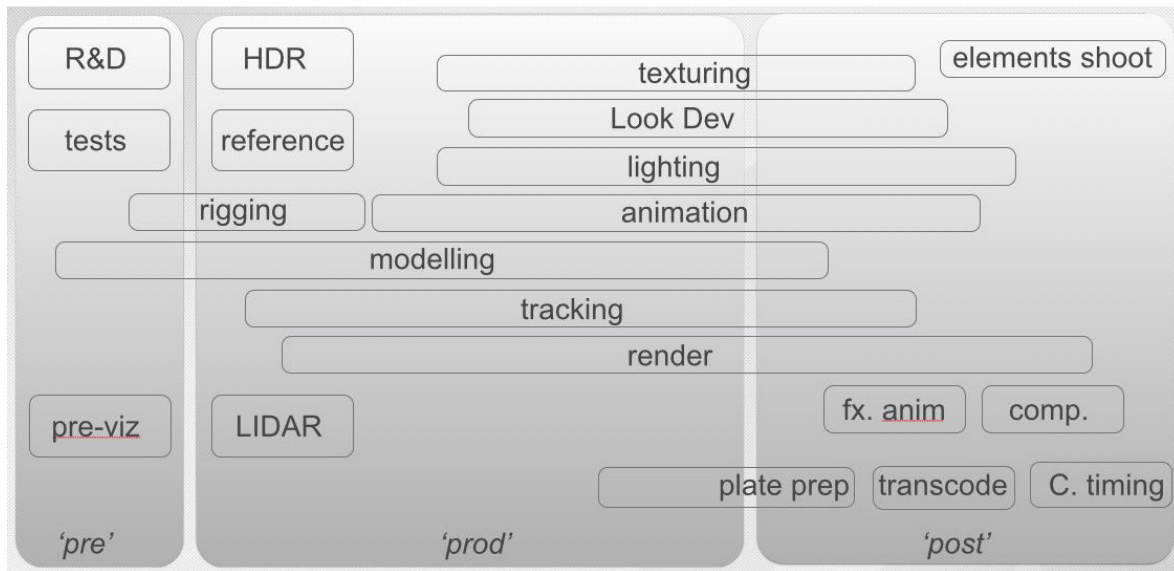


Figure 1: A traditional waterfall model of visual effects as part of a waterfall model, compared to a more modern and accurate representation of current VFX Project Management Practice (Seymour 2015).

We have also found that processes similar to those disclosed within the Scrum methodology are shown to exist in VFX projects (Table 2). Research has indicated that Scrum provides “an agile approach for managing software projects while increasing the probability of successful development of software” (Salo and Abrahamsson 2008). We plan to continue our investigation in exploring the existence of agile-related practices even where different naming

conventions may be used or where such processes are independently arrived at from specific industry evolution of practice.

PM Characteristic	Typical Agile Characteristics	Typical VFX (including similarities noted from preliminary exploration), Seymour (2016)
The standup	The daily process of reviewing during a sprint and discussing tasks within the team	The Dailies. A daily projected review of each shot, for notes, discussion, approvals and problem discussion (Vaziri 2015). This is a viewing and reviewing process for the broader team, but there are no formalized individual team standups.
Sprints	The size of the project is a major variable.	The size of the project may vary in a number of shots, but the process and average engagement has a typical length, and this project delivery date is very well known at the start of the engagement. There are no formal standardized Sprints.
Scrum boards (or Kanban Boards)	The use of Stories, to do, in progress and testing style visual representation, which is a focus for Stand-ups.	The term ‘stories’ would overlap with the use in the narrative sense in the VFX world.
Product Owner, Scrum Master and Team Members	There is a lack of a single Project manager, instead there are multiple roles doing different things.	The VFX Producer is not the project manager in the PMBOK sense, since there is both the creative lead and the producing lead along with the VFX supervisor.
Product and Sprint backlogs	The separation of tasks into Sprints with lists maintained of backlogs rather than just a Gantt chart of tasks head.	When there is a storyboard, this is used as a Product backlog.
Early release evaluation / Always ready to ship	The project is maintained in a ‘ready to ship’ configuration after each sprint, and not just integrated at the end of the process.	A cut of the film is maintained during the entire post-production process. This is ‘wall papered’ with each later version and iterative improvement from storyboard, to animatic, to previz, post-viz, rough comp, and various final quality versions. At all times the sequence can be played to view any shot in context. This is similar.
Self managed high performance teams	Cross functional self-managed teams.	VFX is cross functional in skills, and in the combination of creative and producing staff (including producers and line producers etc.)
Adept to change. Embracing of Scope change	Scrum seeks on going involvement of the project owner and does not assume the project is rigidly defined prior to production	VFX is assumed to most often find a visual solution, thus until major aspects such as the principle photography and primary edit are done, there is no expectation of detailed scope definition. On going review, revision and variation is assumed. This is similar
Customer collaboration	Scrum has a formality of customer involvement.	VFX has a rigid structure with respect to the customer, which is defined inside the project as Director, although it encompasses the director’s producing staff and often the film’s funding studio.

Table 2: Scrum (APM) style implementations in VFX Project Management Practice.

Having surveyed the industry looking for VFX companies that have adopted APM, only few such companies exist. In several cases, APM had been used but it is not the primary ongoing project management approach and with others it was newly adopted or only now being explored. We therefore, explore Table 2 by investigating a rare case of a

VFX company that has adopted APM: Ukraine-based “Cinnamon VFX”. Currently, we know of no other facilities that have characterized their project efforts as so ‘completely’ agile.

Insights from the exception to the trend: An overview of Cinnamon VFX

Cinnamon VFX is an independent Eastern European based VFX house founded in 2006, by Vadim Konov and Alex Prihodko. The company works on both VFX feature films and TV commercials. While the company services the local market it also does significant amounts of international feature film work, such as *Where the Wild Things Are*, *Diana*, and *Brighton Rock*. The company has worked with major facilities such as The Mill (UK), Framestore (UK), and Liga01 (GmbH), Seymour (2016). Our preliminary investigation makes them an ideal subject for a more detailed qualitative abductive case study. The company has agreed to participate fully with the research and present as an excellent candidate. For the first several years, the founder’s described the company as following a traditional approach. In 2009, after an extensive investigation of alternatives, the company started a two-year transition to APM. Prior to 2009 the team had experienced difficulty with task load balancing, serious overtime blowouts and managerial concerns over sustainability. Senior management then embarked on what has become an ongoing evaluation and investigation of alternatives relative to their project objectives and constraints, to find a better project management solution. They had tried to solve their issues with a range of various software tools including Microsoft Excel and Project and specialist tools but none of these directly solved their issues and so the company decided that their entire approach needed to change.

One of the founders commented: “*Like sailor, you can’t change various weather, wind and ocean condition, but can adopt sails to survive and follow the route needed*”. Rather than assuming the constant changes (and shifting scope of their projects) as a characteristic of poor planning they embraced the situation with an adaptive, agile approach realizing that these were ongoing characteristics associated with the film industry. Having transitioned to APM, they now believe their company is more balanced in its workloads, runs with less unscheduled overtime and is more effective at solving their customer’s needs (Seymour 2016).

Our preliminary findings indicate that in the film industry, few companies have embraced APM the way Cinnamon have. In particular, we have found that:

Limited, explicitly cited adoption of APM

- Project management processes are not called ‘Agile’ nor do they use specific agile terminology
- Greater adoption would seem both possible and desirable but there are significant barriers to full adoption
- The film industry has developed hybrid and perhaps interim agile-like approaches to meet current objectives
- Similarities to software development mask some of the important differences especially in project ownership
- While the VFX industry primarily succeeds in meeting target deliveries it does this at a cost in terms of irregular work practices (e.g. excessive overtime)

These preliminary findings will be quantified and explored during the next stage of our research.

CONCLUSION AND NEXT STEPS

The importance of effective project management in organisations is widely recognised and studied. Research on project management in the film industry however, is still in infancy. This is surprising given the high profile nature of the projects involved and that the film making project process is repeated constantly with many of the same stakeholders on an eternal cycle of supplying new and more elaborate films to a global cinema audience. This contained and annually repeated agenda allows for the unique evolution of project management heuristics to an industry that has received little research attention. Our research aims to contribute by bridging this gap and investigating project management approaches, methodologies and/or practices in the VFX industry.

With this research we contribute a better understanding of the nature of non-software development APM adoption. For IS scholars researching project management, our Adaptive framework of adoption can serve as a useful device for the migration of APM to any creative industries exhibiting characteristics consistent with an APM-style approach to project management. Barriers to adoption can also illuminate the need for new approaches and advance our understanding of APM outside the realm of software development. We suggest that in looking for the adopted approaches in the underlying theoretical model of APM, researchers are encouraged to think beyond industry-specific labels and terms to the core approaches and to investigate the adaptation and meaning attributed by the

practitioners to the use of ‘agile-like’ methodologies. Rather than focusing on the original manifesto terms, it may be more productive to investigate how these principles are enacted in creative industries and what purpose such enactments serve for delivering better project management. In addition, further research could explore:

- Cross-case comparisons between adapted APM deployments in VFX to that of ASD practices deployed in the IS/IT sector. As a result, there may be opportunities to glean more theoretical insights and explore best practices between these two sectors.
- A refined adoption indicator for those industries well placed to embrace APM.

In exploring this seemingly surprising contradiction with regard to APM adoption in the VFX industry, we hope to gain further insights into why other industries may or may not adopt APM directly and to set a research agenda for a variant or adaptive approach to APM for non-software (yet APM-appropriate) companies.

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