People Over Process:
The Implications of Agile for IS Skills and Human Resource Management

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Executive Summary

Agile approaches to information systems development have become increasingly popular in recent years, as more and more IS organisations are eager to capitalise on the alleged opportunities and benefits they provide. However, transition to these approaches is often far from trivial, and can be extremely problematic. Our study of 20 organisations will focus on the skill gaps caused by the emergence of agile and will identify the top ten key distinctive skills required in an agile environment. Our study will also identify the major strategic human resource challenges and practices to address skill needs and career development in today's agile environments e.g. recruitment, training and performance evaluation. Particular emphasis will be placed on the distinctive implications of global, and thus distributed, systems development on these challenges. This will be particularly relevant in the coming years as agile approaches cross the chasm from small, co-located project teams to large-scale, multi-organisation, multi-site development across many countries and time zones.

Introduction

The last 10 years or so has seen the emergence of a number of systems development methods, which have collectively been labelled as *agile*. Some of the most popular include *eXtreme Programming (XP)* (Beck 1999), the *Dynamic Systems Development Method (DSDM)* (Stapleton 1997), *Scrum* (Schwaber and Beedle 2002), *Crystal* (Cockburn 2001), *Agile modelling* (Ambler 2002), *Feature Driven Design (FDD)* (Coad, de Luca et al. 1999) and *Lean Software Development (LSD)* (Poppendieck 2001), along with variants of each e.g. XP-Lite (Aveling 2004). These methods have been well received by those in ISD and there is strong evidence to suggest that awareness and indeed use of these methods is highly prevalent across the community where progressively more organisations are unable to ignore this "agile wave" (Nerur, Mahapatra et al. 2005).

While agile methods have now been in use for quite a while, there are a number of reasons why it is important to examine the implications for skills and human resource management as part of this special issue:

- *Rapidly increasing prevalence of agile approaches:* The growing popularity of agile methods is clearly evident and "agile techniques are fast becoming the adopted methodology commerically" (Tan and Teo, 2007). A survey conducted by Schwaber & Fichera (2005) for Forrester Research show that 14% of North American and European organisations have adopted agile processes with a further 19% either interested or planning to do so in the future. In addition, a survey conducted by Ambler (2007), consisting of 600 participants, showed that 69% of respondents had adopted agile techniques with an additional 7.3% believing that agile would be adopted within a year. Finally, a survey conducted by Vijayasarathy and Turk (2008), having a total of 98 respondents indicated that 60% use agile approaches in 75% or more of their projects (Vijayasarathy & Turk, 2008). Continued growth of agile adoption requires renewed consideration of the skills required and challenges to be faced.
- *Removal of traditional agile boundaries:* In the first few years following the emergence of agile methods, their use was largely restricted to small, co-located,

highly experienced teams developing non-critical systems. However, the boundaries of agile are now changing, and non-standard application of agile approaches such as large teams, start-ups, distributed environments, greenfield sites, educational environments, open source environments, outsourcing, and systems maintenance. As these boundaries continue to fall, and agile approaches are applied in environments outside of their 'comfort zone', this will present new challenges in terms of skills and human resource management.

- *Pressure to adopt agile:* At one time, the decision to adopt agile was an insular one, and the organisation could decide to embrace or rebuke the transition 'on its own terms'. Increasingly, suppliers, consultants, partners and customers are coercing the use of agile, either through a formal requirement to do so, or through necessity to ensure inter-organisational process alignment. In fact, one of the consulting firms studied in this research stated that the use of an agile approach is now a key line item in many tender calls from public sector bodies, traditionally renowned for being highly beauraucratic, inflexible, and non-responsive to change.

The Impact of Agile Approaches on Skill Requirements and Challenges

The increasing prevalance of agile approaches, the lowering of traditional agile boundaries and growing pressure to adopt agile, all increase the need for human resource departments and project managers to evaluate the impact on required skills and associated challenges. An analysis of the literature (e.g. Nerur, S., R. Mahapatra, et al. (2005) and Schuh, P. (2004)), shows that agile environments are significantly different in context to environments where more traditional approaches are used. The fundamental differences between traditional and agile approaches are presented in the following table:

Project Component	Traditional	Agile
Control	Process centric	People centric
Management Style	Command-and control	Leadership-and-collaboration
Knowledge Management	Explicit	Tacit
Role Assignment	Individual – favors specialization	Self-organizing teams – encourages role interchangeability
Communication	Formal and only when necessary	Informal and continuous
Customer's Involvement	Important, usually only at the analysis phase of the project	Critical and continuous
Project Cycle	Guided by tasks or activities	Guided by product features
Development Model	Life cycle model (Waterfall, Spiral, or some variation)	The evolutionary-delivery model
Desired Organisational Form/Structure	Mechanistic (bureaucratic with high formalization)	Organic (flexible and participative encouraging cooperative social action)
Technology	No restriction	Favors object-oriented technology
Team Location	Distributed	Collocated
Team Size	More than 50 people	Up to 50 people
Continuous Learning	Discouraged	Embraced
Management Culture	Command and Control	Responsive
Team Participation	Unwelcome	Mandatory
Project Planning	Up Front	Continuous
Feedback Mechanisms	Not Available	Several
Documentation	Substantial	Minimal

Table 1: Differences between Traditional and Agile Approaches

The fundamental differences illustrated above, directly influence the skill requirements of both prospective and existing employees in agile projects. In 1995, Lee, Trauth et al. documented growing changes in skill requirements within the ISD domain. At that time, one of the main facets driving these changes related to 'changing business environments'. Once again, over a decade later, the change in business environments which has led to the onset, adaptation and rapid growth of agile deployment will mean a transformation in the required skill-set forming the ISD team. For example, in an agile development environment developers are not confined to a specific specialised role, as is usually the case with traditional approaches. Instead the team are encouraged to self-organise, interchange and blend roles on a continual basis (Nerur, Mahapatra et al. 2005). As such, developers are involved in various roles which require strong interpersonal skills that may fall outside their traditional skill areas.

In addition, Boehm and Turner (2005) discuss business process conflicts between agile and traditional projects. In relation to human resources they outline how "agile development team members often cross the boundaries between standard development position descriptions and might require significantly more skills and experience to adequately perform" (Boehm and Turner, 2005). This further supports our argument that as the periphery of skills required for agile projects expands, increasing challenges are posed on human resource management in relation to recruitment, training and performance evaluation criteria.

The Research Process

The objective of this study is to develop an understanding of the key skills required for agility and the key challenges that agility poses for IS staff recruitment and management. To do this, a two-phased approach is used. Firstly, we conducted six focus group discussions with IS executives, senior project managers, and agility experts between June and September 2008. In the second phase we will conduct 20 case studies (see Appendix A) using in-depth interviewing techniques with senior IS personnel. These will take place between October 2008 and January 2009. The cases include organisations that have embraced agile development very effectively and have seen clear, tangible benefits as a result; including reduced costs, higher quality systems and more satisfied IS staff and customers. The studies also include some organisations that have experienced significant problems and even project failures directly attributable to the agile transition. We intentionally selected cases with such opposing experiences, which allowed us to compare and contrast, thus identifying the distinguishing skills and challenges related to agile adoption.

Preliminary Findings

A preliminary analysis of the data collected during the initial focus groups have revealed a number of interesting challenges that IS organisations are facing as they transition to agile and the critical capabilities that are required to overcome them. Analysis of this data is still ongoing, but initial challenges of major importance to the organisations studied seem to include:

> *Transitioning existing staff to adopt new approaches:*
> As agile project approaches are fundamentally different to traditional (see table one), coherent transition measures should be in place to allow employees to adapt to agile and be successful in doing so. However, many organisations do not have specific training or mentoring plans in place to manage such a transition. Some organisations studied, experienced a seamless and, in some cases even enjoyable tansition to agile, but others were a lot less successful which directly resulted in project failure and abandonment.

Resolution of political / social issues:
Due to the fact that agile approaches 'turn up the dial' on social interaction; political and social issues seem to be much more prevalent. Resolution also seems to be more difficult due to the co-located, continuous, intense interaction and the blended nature of roles. This makes it difficult for managers to delineate work and minimise contact between problematic team members.

Performance reviews:
Criteria for performance evaluation, particularly at junior levels, usually focuses on technical skills and the ability to follow direction whereas distinguishing factors in agile development involve social skills, creative thinking and self-organisation. In the organisations studied, agile teams are very often evaluated according to traditional criteria, and so results are often not indicative of the true abilities of the team members.

Team members dissatisfaction with Career progression.
The fact that agile encourages blended roles, is dependent on voluntary contributions and emphasises team as opposed to individual performance, means that team members may become a 'jack of all trades' but lack the opportunity to hone a smaller number of key skills e.g. Java certification. As a result, in the cases studied, some team members felt they were being disadvantaged when competing for promotion or jobs in the marketplace.

Sourcing graduates with appropriate skillsets:
Very few third level institutions incorporate agile methods and skills to any significant degree and students are usually trained according to the traditional waterfall model. Furthermore, degree programmes tend to lean heavily (if not completely), toward intense technical or business skills but rarely incorporate both. Many of the organisations studied could not, or at least have not, identified courses that apply and integrate both these skills. Therefore, they continue to hire graduate employees from the same program sources as when recruiting for wholly traditional, techically-oriented projects.

A full analysis will elaborate on each of these issues, will extend the list and provide illustrative quotes and examples drawn from the subsequent cases.