Review of Studies on Agility in Knowledge Management

Ferdi Sönmez, Başak Buluz

Abstract—Agility in Knowledge Management (AKM) tries to capture agility requirements and their respective answers within the framework of knowledge and learning for organizations. Since it is rather a new construct, it is difficult to claim that it has been sufficiently discussed and analyzed in practical and theoretical realms. Like the term ‘agile learning’, it is also commonly addressed in the software development and information technology fields and across the related areas where those technologies can be applied. The organizational perspective towards AKM, seems to need some more time to become scholarly mature. Nevertheless, in the literature one can come across some implicit usages of this term occasionally. This research is aimed to explore the conceptual background of agility in KM, re-conceptualize it and extend it to business applications with a special focus on e-business.

Keywords—Knowledge management, agility requirements, agility in knowledge management, knowledge.

I. INTRODUCTION

EVERY organization, no matter what their scales and types are, endeavors to adapt to a continuously changing environment. And, it is commonly accepted that change is not temporary and will not disappear. In that respect, companies have comprehend that agility is vital for their survival and competitiveness [1]. In such a volatile environment, sustainability of any organization requires high level of adaptation capacity and capability. But, this capability may not even be sufficient by itself. It might also require prompt responsiveness in order to comply with the high speed of change in the environment. If the organizations cannot keep up with the change of the environment, although they can realize their organizational adaptation, they might still remain obsolete due to the slow rate of adaptation capability.

Firms ought to be courting their own radical transformation, rather than continuing to do what they have always done in the way that they have always done it [2]. In that respect, organizations put tremendous effort, and allocate big amount of budget in order to adapt themselves quickly and correctly. In other words, they strive to be agile.

Agility has already become and apparently will remain as one of the most important challenges for the organizations. Although its importance is only now starting to be recognized, big question marks still remain about how to achieve it. That is why organizations also need to consider the dynamic environment conditions, and should realize the process of KM in an agile manner.

Agility and adaptiveness coexist within the context of the complex and changing environment [3].

II. DEFINITION OF AGILITY

In information technology, it is proclaimed that agile development is the ability of ‘fitting the process to the people, rather than people to the process’ [4]. This expression may not be limited to the field of information technology; it can be valid for all the fields in terms of agility. It is generally suggested that the abilities of knowledge and learning constitute significant domain for agility.

III. APPLICATION AND THEORIES OF AGILITY TOWARDS AKM

The literature presents a little information in terms of explicitly addressing AKM applications and theories. However, there are plenty of practical and theoretical studies - those imply different aspects of AKM.

A. Agile Enterprises

The reason being of the enterprises are not just to respond to the requests for the services. They are also driven by the internal events of the enterprise and business environment in which the enterprise functions. It might be the reason that in most of the companies/enterprises Chief Information Officers (CIOs) are the ones who are managing the transformation. Vandergiff, on the other hand, takes attention to the decision support systems in enterprises. Moreover, Vandergiff argues that enterprises need more aware, comprehensive and active decision support systems [5].

B. Agile Project Management

Various researchers studied the relation of KM with project management.

According to Landaeta, the understanding of projects as complex adaptive systems has brought about the idea of agile project management [6]. Inside this domain, Scrum (an agile software development technique) has become the choice of many organizations which have struggled for years on how to endure in business while meeting project objectives. Per the generic idea of agility, Scrum also seeks to respond to changes rapidly and effectively.

C. Agile Learning

Agile learning is mostly mentioned and practiced in the field of electronic learning and information technologies. For that reason it is to some extent addressed along with some software programs such as knowledge-based process asset libraries, agile learning portals (Intrepid Systems), electronic teaching...
ports, Wiki’s. In this context, agile learning is referred by the
learners for reaching exactly to what they need and precisely
when they need.

Within the organizational perspective, agile learning
understanding can be traced back to Peter Senge in 1997, with
his book called ‘The Fifth Discipline: The Art and Practice of
the Learning Organisation’, in which he challenges
organizations to develop the capability of learning and adapting
quickly [7]. Along with that idea, agile learning understanding
has been mainly acknowledged with its importance to respond
to the need of complying with the speed of change in order to
improve competitiveness.

Clark and Gottfredson, as the CEO and the Chief Learning
Officer of TRClark Company, respectively, direct a question
for the companies and then try to find some responses for that
question. The question is: ‘How can organizations sustain
competitiveness?’ They suggest the answer would be in the
pursuit of learning agility, and proposed that organizations
must hasten knowledge cycles to maintain competitive cycles
improvement.

Singh et al. issued different tests as a part of a questionnaire.
Additionally, method engineers can extend current methodologies or engineer new ones to appease the
specific requirements of the project [21].

Ghobadi and Mathiassen identify the problems with
maintaining and evolving the data warehouse to be error prone,
complex, and time consuming. They claimed that a data
warehouse environment is in constant change. On the other
hand, the warehouse requires to provide a balanced and regular
interface to information stretching over a lengthened period of
time. They proposed an agile knowledge modeling technique
which promotes non-destructive extensibility mechanisms,
through providing flexible and healthy change management
[22].

V. Agile Knowledge Management
The literature review exposes that there is very little
background about AKM in the literature except for some
theoretic studies and applications in the area of software
development and information technologies [21], [23].

D. Agile Software Development (ASD) and Agile Manifesto

Both software practitioners and scholars admittedly agree on
the importance of knowledge and that software development is
a knowledge exhaustive process. Dove and Holz, Melnik and
Schaaf have first acknowledged the similarities and the
connection between the ASD and KM where they emphasize
that both disciplines handle organizational culture and change
management [9].

Agility in software development was first recognized by the
practitioners, like the other disciplines. As one of the most
eminent initiatives, in 2001 the core values and principles of
agile development were officially announced and approved in
the declaration of the Agile Manifesto by some of the
outstanding agile community members [10]. This manifesto
defines 12 principles for ASD [11]. Table I depicts the
examples of agile approaches/methods [10]:

<table>
<thead>
<tr>
<th>Approach or Method</th>
<th>Principles Highlighting Agility in Software Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSDM [8]</td>
<td>• Development is incremental, iterative, and driven by feedback from user.</td>
</tr>
<tr>
<td>Agile Alliance Manifesto [11]</td>
<td>• Regular build and inspection to assure timely systems.</td>
</tr>
<tr>
<td>Scrum [9]</td>
<td>• Welcome to changing requirements, even it is late in development.</td>
</tr>
<tr>
<td>XP [10]</td>
<td>• Agile processes promote sustainable development.</td>
</tr>
<tr>
<td></td>
<td>• Deliver working software frequently.</td>
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<td></td>
<td>• Continuous attention to technical excellence advances agility.</td>
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<td></td>
<td>• Software developer team determines features of each sprint from an evolving product backlog.</td>
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<td></td>
<td>• Create an increment of potentially shippable software during each sprint.</td>
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<tr>
<td></td>
<td>• The highest priority is to satisfy the changing customer needs deliberately.</td>
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<td></td>
<td>• Rapid user review and feedback.</td>
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</tbody>
</table>

IV. Examples of Agile Studies implying KM

Along with mentioned fields, there are also some other areas
those imply AKM as well. Table II below indicates the
summary of these examples along with the agile applications
mentioned before. Youssef et al. introduce time as the new
norm for competing along with the quality and cost, in their
study regarding Time-Based Technologies and on the
operations and manufacturing of the small and medium size
firms. They assert that the organizations adopting time as an
ambitious advantage are agile and learning organizations [18].
That is the reason that such organizations are supposed to
introduce change and ready for the challenges which come up
with it.

Singh et al. issued different tests as a part of a questionnaire.
They determined that the Indian software industry selected to
work with agile practices, needs support on KM deployment.
Meanwhile, organizations in India do not have a formal head
that is able to provide the guidelines of agile practices [20].
It is very rare to encounter with the complete term of AKM in the literature except for some software and project management practices and theoretical studies. The studies and practices are not sufficient to address the conceptual basis of the construct in the scholarly literature. Actually, it is hardly possible to find peer-reviewed publications which explicitly address AKM related or agility integrated with KM. Meanwhile, some studies use the term ‘AKM’ which is derived from ASD and KM practices.

Levy and Hazzan are the two first scholars who introduced the term ‘AKM’ out of the scope of project management and software development, with the assumption that KM is vital for any project [23]. But still their study is more projects oriented and then the idea of capturing the knowledge gained by individuals and spreading this knowledge to others in the organization [26]. Meanwhile, O’Byrne also mentioned the need for the ‘agile strategies’ to make it more effective based on the comments of Daniel G. Simpson, Director of Strategy and Planning at Clorox Co. and Bain’s 1997 surveys. He quoted ‘agile strategies’ as the encouraging managers’ strategy to wait for profitable courses to emerge and then outrun the competition.

In 2005, the ‘Third Biennial Conference of Professional Knowledge Management’ discussed integration of the Just-In-Time (JIT) concept into the KM discipline in Kaiserslautren, Germany. In the conference, while various scholars shared their perspectives with conceptual understanding, some scholars introduced practical usages of JIT. In the conference (later published as a book), Evans et al. introduces the concept of JIT [27] for adapting to the KM discipline. Siebert also asserts JIT information delivery as a knowledge creation process and acquires a framework where he claims this framework enables intelligent technologies. He further posits that JIT information delivery starts with multi-agent environments [27].

McKellar implies AKM, although he does not explicitly name it [28]. In his study, he exemplifies a list of companies embracing KM. Landeta et al. also addresses the need for agility, while defining the KM as ‘the processes, techniques and tools which offer the right knowledge to the right knowledge worker, at the right time’ [6].

C. AKE (Agile Knowledge-Based Enterprises)
Table III gives a summary of the KM studies implying AKM.

VI. RESULTS
A. Knowledge
It is hard to comprehend all definitions of knowledge published in the literature. It is equivalently difficult to reach a definition that covers all of the perspectives or has a clear

### Table II

<table>
<thead>
<tr>
<th>Author</th>
<th>Agility Specifics</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kandu et al.</td>
<td>- Challenge of flexibility</td>
<td>- Agile supply chain operation strategies [12]</td>
</tr>
<tr>
<td>Jain et al.</td>
<td>- Customer focus of mass customization [12]</td>
<td>- Agile Supply Chain management (SCM) [1]</td>
</tr>
<tr>
<td>Lee et al.</td>
<td>- Complex process [1]</td>
<td>- a New Type of ES (expert system) called IMIXAO [13]</td>
</tr>
<tr>
<td>Blake and Singh</td>
<td>- The need for light-weight process and responsiveness [14]</td>
<td>- Model driven software engineering process [14]</td>
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<tr>
<td>Genero et al.</td>
<td>- Highly dynamic business environment</td>
<td>- Conceptual data models [15]</td>
</tr>
<tr>
<td>Macris et al.</td>
<td>- Flexibility</td>
<td></td>
</tr>
<tr>
<td>Macdonald and Matinez-Uribi</td>
<td>- The need to increase the affectivity [17]</td>
<td>- User training material [16]</td>
</tr>
<tr>
<td>Youssef et al.</td>
<td>- Time as the new norm for the.</td>
<td>- Research data repository by employing agile community [17];</td>
</tr>
<tr>
<td>Ronnback et al.</td>
<td>- To be ready for the challenges of change [18]</td>
<td>- Time-based technology [18]</td>
</tr>
<tr>
<td>Ramsin and Dehghani</td>
<td>- A criteria-based evaluation framework for assessing KMS development methodologies. [21]</td>
<td>- Evaluation for a successful KMS [21]</td>
</tr>
<tr>
<td>Ghobadi and Mathiassen</td>
<td>- Knowledge sharing in agile development [22]</td>
<td>- Create shared understanding in software teams [22]</td>
</tr>
</tbody>
</table>
In a sense, in terms of its importance, knowledge is a very valuable intellectual asset for any organization. The literature review on knowledge revealed that ‘the construct of knowledge’ is at the necessary level of maturity [20], [21], [23], [33]-[35].

B. Knowledge Management

The two significant domains for KM are ‘learning’ and ‘knowledge’. While individual knowledge and learning would rather be assumed as a manageable process, organizational aspects of learning and knowledge require significant management capability.

KM, with the idea of capturing knowledge gained by individuals and spreading it to the others in the organization is an idea, about which a lot of organizations have interest including the e-business.

The literature review poses that the KM discipline has gradually moved towards its academic maturity [20], [23]. Academic debates gave rise to concern both to the theories and practices of KM by including different perspectives, with the advances in the discipline.

C. Need for Agility

The need for agility stems from the specifics of the environment (including external and internal human factors); rapidly changing environment, uncertainty, changing customer requirements necessitate agility.

In the literature, it has been elaborated that different disciplines use and study agility with respect to their specific needs [23], [33]-[35]. Both the academic literature and the practices provide quite a number of examples of agile applications and theories. Among them, those related with KM have been exemplified in this research. Moreover, these examples clearly indicate that there exist many theoretical and practical studies about agility in different disciplines which are beneficial for contribution to KM.

D. Agility in Knowledge Management

The literature review reveals that there is very little background about AKM in the present literature except for some theoretic studies and applications in the area of software development and information technologies. However, some studies [33]-[35] in the KM literature imply the need for KM, although none of them explicitly designates the term ‘AKM’.

E. Literature Review Analysis

The literature about KM and knowledge within the scope of this research is at the level of academic maturity. The literature also shows that interaction of KM with other disciplines and its inevitable expansion moves toward AKM. On the other hand, the specifics of the dynamic and complex environment necessitate agility, and hence, AKM in consideration of adaption with the changing environment immediately and handle ensuing challenges effectively.

There are numerous agile applications and theoretic studies in different disciplines. Some of them seek for the contribution of KM, which leads us to AKM.

The literature lack sufficient AKM conceptual works and practices, with the only exceptions some studies and practices about software development and information technologies.

When looking from the perspective of e-business, it is observed that limited understanding and applications of KM and unsatisfactory applications of AKM lead e-business organizations to work on AKM. On the other hand, the e-business environment reflects similar specifics to the real market environment (sometimes even more challenging). Those specifics of the environment dictate that e-business be more adaptive and agile, which actually requires AKM.

Upon those considerations it can be concluded that, the expansion direction of KM, the needs stemming from both the civilian and e-business environment, the expectations of the other agile disciplines for KM contribution and the insufficient literature about AKM, clearly address that in the current body of knowledge.

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