Journal of Stock & Forex Trading
ISSN: 2168-9458

Lin and Chen, J Stock Forex Trad 2015, 4:2
DOI: 10.4172/2168-9458.1000150

Opinion Article Open Access

# Cloud-Based Knowledge Service for Global Enterprise Collaboration

**Hsiao-Kang Lin and Chun-I Chen***

*Department of Industrial Management, I-Shou University, Kaohsiung, Taiwan ROC*

***Corresponding author:** Chun-I Chen, Department of Industrial Management, I-Shou University, Kaohsiung, Taiwan, ROC, Tel: +886 7 657 7711; E-mail: EddyChen@isu.edu.tw

**Received date:** April 13, 2015; **Accepted date:** April 14, 2015; **Published date:** April 21, 2015



**Abstract**

With the growing popularity of cloud computing, enterprises are turning their collaborative platforms towards Software as a Service (SaaS) via the Internet. Cloud technology paradigms are being considered for digital data intensive science, business transactions, open source data, discussion forums, social networks, wikis, tweets and other unstructured data to connect people and share knowledge on a global level. This paper aim to introduce and develop the concept of a knowledge service, which is a combination of cloud computing, knowledge community, self-learning knowledge for Global Enterprise Collaboration (GEC). The cloud-based infrastructure must facilitate the effective and efficiency transmission of knowledge with the right expertise and those that enable connections with the right information for GEC and share knowledge at the international level.

**Keywords:** Cloud computing; Knowledge management; Knowledge service; Global enterprise collaboration

## Motivation

Trends in the servitization of product have given rise to the challenges of mass customization, shorter product life cycles and cost control complexity. Furthermore, uncertainty in the global financial system has led to additional pressures on industrial enterprises when facing the unstable order or rush order effect, short lead times, making reductions in inventory levels without impacting adversely on customer service…etc. How should the extensive production management experience of small and medium-sized enterprises (SMEs) are developed in response to these trends?

Delivering the answers that SMEs are encouraged to technological innovation and cooperation for information access at a global level. In addition, SMEs requires making full use of Information and Communications Technology (ICT) to capture real-time data during the entire production work flow, prompt updates of production-line digital information, accurate estimates of the production planning arrangements, enhanced production processes and process controllability, cooperation with network monitoring / network marketing …etc.

In recent years, modem enterprise systems have undergone profound changes, driven by the development of synergistic operating networks and cloud–service models. Moreover the landscapes of collaborative approaches have emerged to the cloud technologies that were designed to help enterprises, particularly for SMEs, provide more cost-effective services to their global collaboration partners and customers. The accelerating pace of change means that enterprise will dramatically escalate the pursuit of integration and interoperability on the Internet/cloud to facilitate Global Enterprise Collaboration (GEC). Cloud technologies make significant inroads toward ubiquitous interoperability. The evolution of enterprise collaboration therefore needs to be evolved along with the ICT evolution, as shown in Figure 1.

A significant number of research and technology have integrated computation, networking, mass storage and various cloud-based services and tools in an excellent position in this respect, such as, Amazon Web Services, Windows® Azure™ [1], Google App Engine, OpenStack [2]. While the above research and technology makes enterprise system collaboration necessary, they remain nevertheless at the level of cloud-enabled databases and IT software integration. They fall far short of knowledge relevant to collaborative creation and operation. Furthermore, the need for intelligent collaboration to promote both necessitates and facilitates collaboration. This is not currently met by existing cloud-based infrastructures.

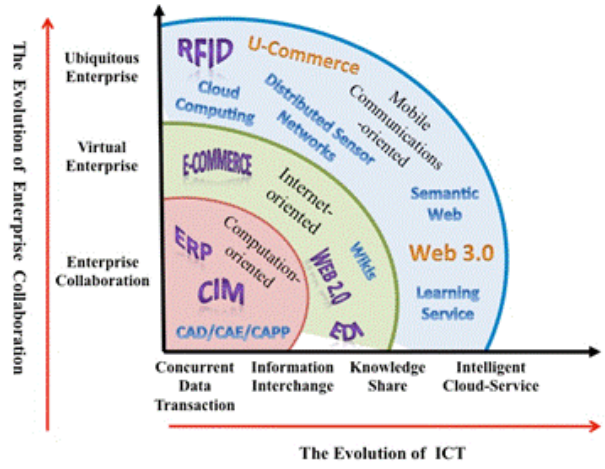


**Figure 1:** The Evolution of Enterprise Collaboration

Looking at the validity of Knowledge Management (KM) and Knowledge Sharing (KS) between current enterprise collaboration systems, some specific challenges (illustrated in Figure 2) of the today's knowledge-oriented collaboration identified by [3], as following:

- **Untapped expertise:** Herbsleb, Mockus et al. [4] described that the difficulties of knowing who to contact about what, of initiating contact, and of communicating effectively across sites, led to a number of serious coordination problems in global collaboration. In addition, considerable innovation and productivity may be lost owing to this failure to harness unidentified or untapped expertise. Frustratingly, everyone involved in the collaboration understands that the skills are almost certainly already available from within the existing community, the challenge is how to identify and make use of this expertise at the time it is required.
- **Mismanaged information:** Unfamiliar with and unaware of each other's work may easy lead to duplication of work, inefficiencies, wrong estimations, etc. Even worse, "uncontrolled" and unsystematic collaboration about complex issues may not only be subject to, misunderstandings, or wrong decisions because of missing knowledge about the business partner; it is also exposed to the risk of unaware, accidental disclosure of corporate secrets and all kinds of confidential information.
- **Misunderstood knowledge:** Communication, knowledge sharing and awareness of available expertise are complex issues for any multidiscipline team with heterogeneous metadata concepts, structure and usage. Furthermore, unmanaged knowledge exchange may not only cause direct problems such as mistakes, or confidentiality problems. These stem from the fact that a systematic assessment of new opportunities or a continuous collaboration-process improvement, etc. can only occur if there is some level of formality and documentation procedures are in place.
- **Unable to learn:** Knowledge should be effectively reused and exploited. Collaboration opportunities may be missed because of lost opportunities to learn or adapt from past collaborations.

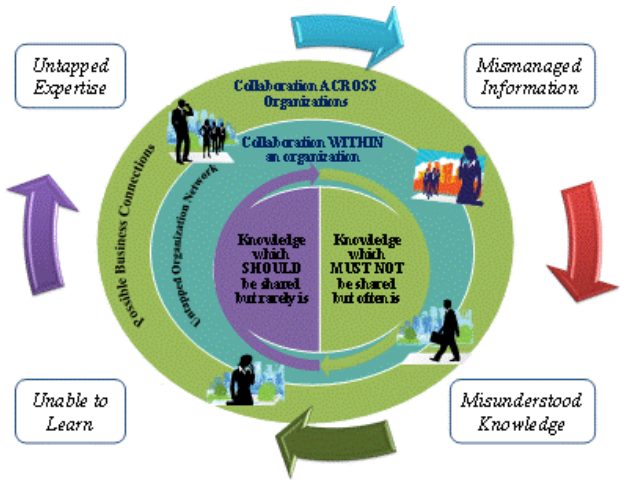


**Figure 2:** The challenges of the today's knowledge collaboration system

In response to these challenges, the next generation of enterprise collaboration system should be able to inter-connect with the right expertise quickly and easily, interoperability with the right information (including capture, storage, search, discover and re-use of content / context), and enable opportunities for the learning and creation of new knowledge. In particular, finding efficient solutions for the above challenges is critical to exploiting the potential of Cloud-Based Knowledge Service, as following.

## Concept of the cloud-based knowledge service

The next generation of Cloud-Based Knowledge Service must facilitate the effective and efficiency transmission of knowledge with the right expertise and those that enable connections with the right information in a cloud-based interoperability and support collaborative enterprises decision making among parties, as following.

**Inter-connections with the right expertise through knowledge community:** Studies [5,6] show that human-related issues in the form of social ties and knowledge sharing were reported as keys to successful cooperation within collaborative networks. Several theories and proposals on "Community of Practice" (CoP) and knowledge management [7,8] advocated the concept of CoP has become associated with finding, sharing, transferring, and archiving knowledge, as well as making explicit "expertise", or tacit knowledge. In today's global organizations and emerging forms of virtual organizations, a Virtual CoP scenario is spurring interest through the building of an internet-based CoP in a virtual team [9]. Recently the rise in popularity of social networking service, by allowing members to express their interests and expertise on the Internet and share content with others and to provide relevant and accurate knowledge as and when needed. These sites enable business partner to assemble into communities and thus improve their effectiveness and making the right connections quickly and easily. Therefore, knowledge community will be easily accomplished by setting of transferring knowledge quickly and efficiently to increase the knowledge sharing speed and allow multi-discipline project team getting the right information at right time, and then make right decision to do things right.

**Interoperability with the right information through cloud-enabled IT integration:** The importance of understanding knowledge sharing with right information has become even more evident with the rise of digital knowledge networks. Researchers of many disciplines have studied ontology and semantic web technologies to enable interoperability of disparate information systems for knowledge processes [10,11]. However, where fully integrated approaches have been developed, problems reside in the scalability of the solution. The complexity and cost of the solution is prohibitive for suppliers and sub-suppliers, typically SMEs who don't have the critical competences to develop, customise and implement integrated IT systems for manufacturing. SMEs require low-cost solutions, modular system architectures and interface standards. Above all standardisation will be key along with flexibility in the manufacturing process and integration architecture based on a "cloud" of databases inside the whole supply chain.

**Evolution and reuse knowledge through knowledge discovery and self-learning:** Knowledge management is an approach not only to detective, capture, organizes store, but also to share, apply and re-use knowledge within the business context and to the orgainsation's benefit. The paramount value added knowledge to the success of the business is to reuse of knowledge and learning from one's own experience, best practices of others and past history [12].

Figure 3 illustrates the overall idea of the next generation of Cloud-Based Knowledge Service for successful global business to promote and facilitate knowledge creation and operation.

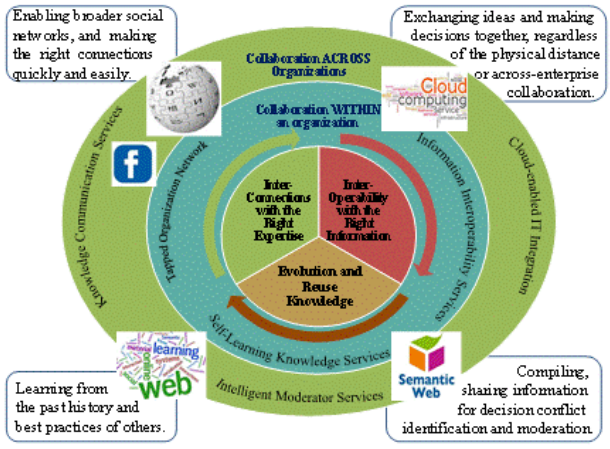


**Figure 3:** The vision of next generation of Cloud-Based Knowledge Service

## Conclusion

Cloud-Based Knowledge Service discusses the development of the necessary technological infrastructure for supporting the flagship initiatives on "Digital agenda [13]", "Knowledge management" and "An integrated industrial policy for the globalisation era" to improve use of ICT / Internet for industrial competitiveness, resource optimisation and innovation, which will be essential for future competitiveness of the SMEs business and help their internationalisation.

## References

1. Windows® Azure™. Cloud Computing Platform & Services.
2. OpenStack (2015) Open source software for creating private and public clouds.
3. Cross RL, Martin RD, Weiss LW (2006) Mapping the value of employee collaboration. The McKinsey Quarterly 3: 28-41.
4. Herbsleb JD, Mockus A, Finholt TA, Grinter RE (2000) Distance, dependencies, and delay in a global collaboration. Proceedings of the 2000 ACM conference on Computer supported cooperative work. Philadelphia, Pennsylvania, United States ACM: 319-328.
5. Sveiby KE, Roland S (2002) Collaborative climate and effectiveness of knowledge work – an empirical study. Journal of Knowledge Management 6: 420-433.
6. Kotlarsky J, Oshri I (2005) Social ties, knowledge sharing and successful collaboration in globally distributed system development projects. European Journal of Information Systems 14: 37–48.
7. Wasko M, Faraj S (2000) It is what one does: why people participate and help others in electronic communities of practice. Journal of Strategic Information Systems 9: 155-173.
8. Thomas JC, Kellogg WA, Erickson (2001) The knowledge management puzzle: Human and social factors in knowledge management. IBM Systems Journal 40: 863-884.
9. Zarb MP (2006) Modelling Participation in Virtual Communities-of-Practice. MSc ADMIS Dissertation, LSE.
10. Wulan M, Dai X, Popplewell K (2010) Collaboration Knowledge Ontologies to Support Knowledge Management and Sharing in Virtual Organisations. Enterprise Interoperability IV. 179-186.
11. Lin HK, Harding JA, Tsai WC (2012) A rule-based knowledge system on semantic web for collaboration moderator services. International Journal of Production Research 50: 805-816.
12. Choudhary AK, Harding JA, Lin HK, Tiwari MK, Shankar R (2011) Knowledge discOvery And daTa minINg inteGrated (KOATING) Moderators for collaborative projects. International Journal of Production Research 49: 7029-7058.
13. Deloitte (2013) Digital Collaboration: delivering innovation, productivity and happiness.