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Improving Student Retention in UK Higher Education Institutions; The potential of using Knowledge as a Service (KaaS)

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ABSTRACT

Cloud Computing, a new technology, which has been recently developed, has initiated the interest from various users, organisations and institutions that wish to use its benefits. Cloud Computing provides a cost efficient approach, enables elastic use of Information Technology through scalability and on-demand computer resources as a service. Furthermore, it offers traditional Cloud Computing services (Infrastructure, Platform and Software as a Service). There is also a new concept which integrates knowledge management and knowledge organisations. Knowledge as a Service (KaaS) is delivered via knowledge markets within a cloud environment. In the current conference paper the author presents the KaaS concept together with its advantages and disadvantages. In addition, the potential KaaS benefits in UK HEIs are also presented. In the paper's conclusion are highlighted potential benefits and opportunities that KaaS can offer to UK HEIs.

Keywords: Cloud Computing, Cloud Services, Knowledge management, knowledge organisation, Higher Education Institutions, Knowledge as a Service, e-learning environments

Introduction

Higher Education (HE) and Information Technology (IT) are two areas that are in close co-operation in order to aid and improve HE services to students. HE is the area defined by the tension between the drive to provide affordable HE and the quality of provision to more and more people (Alexander, 2008). On the other hand, IT has an important role in supporting quality improvement, cost reduction, and through this, educational sustainability (Vanquero, 2001).

At the end of the last millennium, since the computer network development boom, technology use started to be highly mainstream. HE is no exception to this change. There has been limited consideration, thought, to date the role of cloud services within Higher Education. HE industry is considered to be a special industry (Wang & Xing, 2011) because it provides knowledge-based products which are sensitive to both social and reputational variation. IT becomes an increasingly important method of variation in both the associated services and products provided by Higher Education Institutions (HEIs). In addition, due to the development of web technologies such as Cloud Computing and Web 2.0, HEIs use of technology is constantly changing (Ouf, et al., 2011). The new environment adds a new generation of e-learning ecosystems, including Virtual Learning Environments (VLEs), that should be able to operate a wide variety of applications, provide cloud data storage and support multiple hardware devices (Helmy et al., 2011). There are also rapid changes in both technological infrastructure and software applications. In a constantly changing technological

environment replacing existing fixed infrastructure and applications with a more responsive and updateable cloud-based solutions can offer significant benefits for institutions.

Knowledge as a Service (KaaS) is an emerging concept which integrates knowledge types such as knowledge markets, knowledge management and knowledge organisation (Eri et al., 2010). KaaS is a system that provides content based information, knowledge and data as organisational outputs providing answers to queries, enabling facilitation and providing advice for students and staff (Ibid). These outputs are meant to satisfy a user's or a person's individual needs.

In order for the reader to better understand KaaS potential use in UK HEIs an analysis of KaaS current status and how it relates with Cloud Computing is presented in the following paragraphs. Before the analysis, though, the KaaS definition follows.

Knowledge as a Service (KaaS) Definition

Knowledge is an active service not only a resource that is there for mining (Ju & Shen, 2011). All knowledge services are key components and critical infrastructure of the knowledge society that can be implemented as an IT enabled process which organises knowledge and transforms it into real value (Ju & Shen, 2011). Correspondingly, it aids to increase the human capital, improve knowledge worker productivity, bridge knowledge divides and build Communities of Practice (CoPs). Furthermore, it enhances learning in organisations that promotes sustainable economic growth and stable innovation within the knowledge society (Ibid). Drucker (2010) stated that "knowledge has become the central resource and knowledge has to be improved, increased constantly and challenged or it vanishes".

The main Cloud Computing service models are Software as a Service, Platform as a Service and Infrastructure as a Service. KaaS is a service model that corresponds to the aforementioned models. KaaS was firstly introduced in Japan, in 2009, and is a new concept in the education field (Fan et al., 2010). It is a new research field, and with the rapid development of Cloud Computing and Knowledge Management, knowledge service has been integrated as a service that combines knowledge resources (Wu, 2009; Fan et al., 2010). The outcome of such a service is that users can share and exchange knowledge.

Cloud Computing and KaaS Benefits for UK Higher Education Institutions

Cloud Computing, via its benefits, can provide UK HEIs capabilities for e-learning services that are more student focused and agile than traditional VLE methods. This can be accomplished via KaaS, a cloud service approach to knowledge.

Cloud Computing provides:

- Reductions in on-site-data storage requirements. Everything is stored in the cloud so, there is no need for back up.
- High processing power which can be compared to supercomputer level (Ouf, et al., 2011).
- Engagement in learning and teaching methods is improved (Al-Zoune & El-Soud, 2010).

- Better crash recovery – Loss of data is almost not possible as everything is stored in the cloud. In addition, provides better crash recovery (Pocatilu et al., 2010).
- On demand, dynamic scalability (Ercan, 2010).
- To HEIs a low cost solution for researchers, students and faculty (Ouf, et al., 2011).
- To students a more wide-range learning experience through ubiquitous computing (Uden et al., 2007).
- To staff members and students the ability to access their files from any place as soon as they have internet access and a computer device (Al-Zoune & El-Soud, 2010).
- Permanence of data. There is no need for data transfer from one computer device to another as data automatically synchronize in all devices. In other words the users (students & staff) can create a repository of information which is saved and can be used whenever they want (Uden et al., 2007).

Furthermore, according to Wheeler & Waggener (2009), Cloud Computing can offer to HEIs the following attributes:

- Virtualisation: Rapid replacement of a compromised cloud located server is possible without major damages or costs.
- Data access monitoring is easier as only one place should be supervised and not all university computers.
- Improved interoperability: It is hard for fraud people to steal sensitive data (i.e. tests, exam questions etc.).
- Centralised Data Storage: Data and applications are stored in the cloud so, a staff member or a new student can be easily connected with it.

Benefits and Opportunities of KaaS for UK Higher Education Institutions

The key elements for a successful educational transformation are five. Specifically, these elements are: professional development, Information Communications Technology (ICT) and curriculum, policy, research, evaluation and assessment (Fogel, 2010).

Cloud Computing technology and KaaS are playing an important role in the educational transformation. The proliferation of affordable computers, rich educational content and Internet connectivity has led to a global phenomenon in which information and communication technologies are used to transform education (Fogel, 2010, Yuru et al., 2010).

By making ICT more affordable to implement and easier to integrate in the educational delivery, education can be transformed even more, and via KaaS students will be able to develop all the necessary skills in order to meet the needs of the constantly evolving knowledge society. The potential applications of KaaS within knowledge services are many. KaaS can benefit the UK HEIs (students and personnel) by enabling large levels of data analysis, high speed data, and enriched knowledge clouds with more efficient data warehousing and managing. A practical example of KaaS application in HEIs is the use of KaaS in order to improve student retention and performance. This can be achieved via data and knowledge sharing amongst institutions departments. Efficient data

operation can lead to integrated services that can offer reliable data analysis. This can improve the quality of an institution's offering product, which is knowledge, and also improve student services. The improved student services can then lead to higher student satisfaction and as a result better student retention.

KaaS offers opportunities in HE not only in service improvement but also in cost reductions. Hence, these opportunities can lead an expansion of provision to the benefit of more students (Fogel, 2010). Educational transformation can provide opportunities and advantages to anyone who can access it (Fogel, 2010; Intel, 2010, Tsui, et al., 2010). Cloud Computing and KaaS initiatives have already started to develop within UK HEIs. Opportunities for enhanced provision and saving money are promised, via the creation of new jobs thought mobile accessibility, centralised services, scalability, and being environmentally friendly.

In addition, Cloud Computing and KaaS can also provide educational opportunities within UK HEIs including improved student performance, enhanced national academic rankings, higher graduation rates and attainment (Intel, 2010, Tsui, et al., 2010). One of KaaS main attributes is to offer a more effective and efficient data operation that can lead in a better process and analysis of the information held within the UK HEIs services. A HEI which is able to efficiently read all data that relate with its students will be able to provide them with services of higher quality. HEIs most valuable asset is students. Students feel part of an institution only when they feel that their needs have been taken under consideration. It is then, when the probability for an institution to increase its student retention is very high. As later discussed, this can be used by a HEI as a strategic advantage.

The benefits and opportunities from the KaaS use for improving productivity and competitiveness should not be underestimated. Innovation, cultivation of entrepreneurship and new jobs are some clear advantages offered by a very effective technology (Intel, 2010, Tsui, et al., 2010, Yuru et al., 2010). The future possibilities for both the UK and its HEIs are significant. Thus, strategic development and investment are required.

Conclusion

Knowledge is the primary resource of the economic activities in the advanced countries which are generated in service industries (Tsui, 2011). The importance of knowledge is confirmed through the innovation and progress that brings.

The effective use of knowledge within the UK HEIs can aid student stimulation in creativity and interests which can then lead to innovation. VLEs have made a good start in enabling knowledge exchange and information sharing among staff, researchers and students of UK HEIs. KaaS and its unique attributes can provide the academia with the next big step. This is a total system inter-relation and integration. As a result, high level knowledge and information sharing will be achieved. KaaS is the tool that can lead to this achievement.

Through the industry application of KaaS UK HEIs can use examples and ideas for similar KaaS application in the education sector. At this point, it has to be mentioned that UK HEIs and enterprises are in close co-operation via research programs. Both sides have common objectives which are

innovation and knowledge creation. KaaS can offer cloud-based knowledge repositories. These repositories can be available to public or private cloud users through subscriptions (Tsui, et al., 2010). A more in-depth research, for UK HEIs, is required on cloud based educational models exploring how knowledge can be shared and distributed through network-centred universities via KaaS (Yuru et al., 2010).

KaaS usage offers the opportunity to UK HEIs to gain a strategic advantage. Inter-relationships between UK HEIs and commercial enterprises are very important. UK HEIs can introduce a knowledge service platform that promotes them by introducing rich content knowledge and expertise. Furthermore, by collaborating technology with HEIs, enterprises will be able to gain a competitive edge in technological knowledge and advances (Qingsong & Yinan, 2011; Gans and Stern, 2003, p.334-5).

In conclusion, Cloud Computing adaption in both industry and UK HEIs sector is in the early stages. KaaS is still under development and any solutions applied are tested for their effectiveness and efficiency. More cloud services will follow and KaaS will be one of them. Until then, industry and academic researchers should keep testing that technology and fill the literature gap. An updated literature and testing results of high value will give researchers a solid foundation for an appropriate implementation of KaaS in UK HEIs.

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