Document downloaded from:

http://hdl.handle.net/10251/37185

This paper must be cited as:

Lloret Romero, MN. (2012). 'Cloud computing' in library automation: benefits and drawbacks. Bottom Line. 25(3):110-115. doi:10.1108/08880451211276566.

The final publication is available at

http://dx.doi.org/10.1108/08880451211276566

Copyright Emerald

Cloud computing" in library automation. Benefits and drawbacks.

Journal:	*The Bottom Line: Managing Library Finances*
Manuscript ID:	Draft
Manuscript Type:	Article
Keywords:	cloud computing, library automation

SCHOLARONE™
Manuscripts

For Review

"Cloud computing" in library automation. Benefits and drawbacks.

In recent years it has become increasingly more common to hear about the virtues and benefits of the so-called "cloud" for the use of corporate software. Although the use of the cloud in the business environment has already transformed the concept of data storage and resource management, its use in the field of libraries and information centers is somewhat less widespread.

In order to understand how the cloud can be used in this professional environment, it is necessary to first become familiar with the cloud's features and its potential applications in the library and information center industry.

Cloud Computing, also known as "The Cloud", is a highly scalable platform promising quick access to hardware and software over the Internet, in addition to easy management and access by non-expert users. There are various types of "clouds" .

1. **Cloud Computing** may be **public**, in the event that the owner is a provider maintaining the cloud for the entities which own the data: In this case, entities pay for the use and enjoyment of the resource on the Internet.
2. It may also be **private** in the event that the platform is maintained by the institution itself within its facilities. However, the term **Cloud Computing** is most commonly associated with the public cloud.

Cloud Computing relies on technologies such as **virtualization**, programming techniques such as multi-tenancy and/or scalability, load balancing and optimal performance, to ensure that resources are offered quickly and easily. Furthermore, in the case of public clouds, these techniques generate **economies of scale** arising from the efficient use of hardware and human resources. These economies of scale, in turn, have an effect on the price the customer pays,which is of great interest to any institution in current times.

Cloud Computing can be divided into three layers depending on what is being offered by the various companies that offer services of this type. From innermost to outermost, the layers are as follows:

1. **IaaS** or Infrastructure as a service.
2. **PaaS** or platform as a service.
3. **SaaS** or software as a service.

For Peer Review

ADVANTAGES OF CLOUD COMPUTING

1.**Cost reduction**.

Ability to increase or decrease the consumption of hardware or software resources immediately and in some cases automatically.

2. **Scalability.**

"Pay as you go" allowing a more efficient control of expenditures**.**

3**. Lower investment, reduced risk.**

Immediate access to the improvements in the resource proposed (hardware and software) and debugging.

4. **Support included.**

Enjoyment of the most advanced security procedures, availability and performance of providers with experience and knowledge in this type of service.

5. **Greater security and accessibility**

Access to resources from any geographical point and the ability to test and evaluate resources at no cost.

DRAWBACKS OF CLOUD COMPUTING

The drawbacks are actually the same as those encountered by institutions that have information hosted outside of the entity. Whereas, in the case of hard-copy document files and at the enterprise level, this fear disappeared years ago given the benefits of cost reduction in infrastructure management and security, in the case of digital data there is still a huge fear of putting our information in the hands of third parties. This fear arises due to issues such as confidentiality, theft, loss etc. Yet people are increasingly more likely to do so now that the use of web 2.0 and social networks has become so widespread . There is nothing more sensitive than banking or personal data, yet this data is stored in servers over which we have no domain or ownership.

An institution might take the decision to progressively move towards Cloud Computing by uploading applications which are not very sensitive such as: messaging, the booking of rooms, meeting management, the liquidation of costs, and holiday management. Following this learning process, more valuable information involving the corpus of the institution, i.e "Busines intelillence

For Peer Review

" might be uploaded to the cloud. In the case of librarys and information centers, this information would include management funds and network transactions.

AUTOMATION AND CLOUD COMPUTING

In the field of library automation there are several commercial suppliers already offering various adaptations of their products which make the use of the cloud possible to a lesser or greater extent.

The problem is that many of these solutions are not really systems designed by and for cloud computing but rather adjustments of and patches for their commercial developments that enable them to continue selling their traditional products while claiming to offer reductions in cost and more modern management. The report drawn up by Breeding, Marshall "Automation Marketplace 2012: Agents of Change" in April 2012, is an in-depth study on the status of the different versions of commercial software, i.e. owner ,open source etc. .and among those products, it highlights those that already offer the "open cloud" service. This article does not aim to compare these products, but rather to focus on what items should be studied for the purpose of deciding whether to use an open source application and determining how to purchase or contract this type of solutions.

1. The first and foremost priority is an in-depth study of all applications currently being used in the institution. It is necessary to know which type of data is being considered and which kind of applications are already available in the institution as well as the applications which are least user data sensitive. It should be clear that it is important to start off with those applications that affect our users and their personal data the least and especially, the indiscriminate use of such information.
2. Even when purchasing so called "classic" software caution is required about the type of contract being entered into, and in the case of cloud computing even more caution is needed It is important to have a clear understanding of the risks entailed and to enter into a contract in which these risks are fully covered.
3. The possibility of backing out of the services should be ensured. Libraries need to be able to retrieve their information and contract a new"cloud computing" as necessary.
4. The Internet provider must be very reliable because if libraries do not have access, all their work could be lost. Clearly, a portion of the amount saved on cloud computing should be spent on fiber optic solutions, the improvement of bandwidth, server security,

For Peer Review

the expansion of backup services etc. If solutions for these services are not found in advance the transfer to cloud-computing services could be suicidal for both employees and users.

5. Before deciding on a payment method, each institution has to undertake an in-depth analysis to determine which is most suitable. There are different payment methods for the use of cloud computing services , and the one to be used will depend on the services to be contracted by the institution. Most common are the following two payment methods:

a) "Pay-as-you-go" is the standard payment method for **Cloud Computing** . hardware and software services. In this case you only pay for what you use, CPU usage, megas used, the use of a SW, etc. , or for potential use, e.g. in the case of payments made by users accessing the hardware or software platform.

B) "Subscription" or payment for potential use of software or hardware, is another payment method, i.e. the payment of a fixed price over a **certain period of time** (month, quarter or year). You can use service as often as you want without limitations. There are different possibilities:

User .- The amount payable depends on the number of users who use the tool, and user names are not typically intransferable.

Functionality .- Payment for the use of one feature in particular.

Flat Rate .- Payment of a fixed amount and no limitation on the number of users or use of resources.

Any of these payment methods must be studied taking into account the total number of users in the institution. It is even of interest to request a preliminary study from the various providers that have been contacted comprising different estimates depending on the payment method chosen so as to determine which is of most interest to use. In many cases the choice of one or another payment method itself can lead to significant cost savings extending beyond which "cloud computing" providers or services are chosen.

6. The cost of increasing scalable storage options should be known in advance. Many providers offer very competitive prices at first, but then successively increase their rates to a much higher amount. A provider which at first seems less economical future might actually turn out to be cheaper if the initial cost is compensated in the future. As previously discussed, if the pay as you go method is chosen. it is better to choose a

For Peer Review

provider whose future rate increases are lower than to choose one whose original rate is very low.

7. It is essential to verify which future software and hardware updates are and are not covered. Since updates are automatic, it might be assumed that they are covered, but it is important to read the small print to determine the extent to which they are actually covered and for how many years. It must be borne in mind that unlike when purchasing commercial products for use, in the case of cloud computing "YOU ARE BUYING A SERVICE RATHER THAN A PRODUCT". This is not a product that can be inventoried and used although it is obsolete, and consequently, if the institution stops paying or terminates its contract, it could be left without all of its work. Therefore, this is something that must be understood from the beginning when taking a decision on this item.
8. The remote access policies must be very clear ¡ and employees should be able to use the services from anywhere, which can make the time they have to be physically located in the center etc. much more flexible. For this reason, the access levels assigned to each user must be clearly defined so good access policies can be created.
9. Energy savings are key in the use of "cloud computing" since much less energy is used than in traditional data centers, meaning that costs on other items in the institutions can be reduced.

CONCLUSIONS

As discussed earlier, Cloud Computing is nothing new or if "The network is the computer", summarizes the network's data processing capabilities, what has changed?, Why according to market forecasts for 2012 are investments expected to reach close to $42 billion according to the IDC? Above all there are two key aspects will be crucial to overcoming the institution's resistance to promoting this type of solutions.- The democratization of information systems. This will put the ability to develop important business initiatives without the need for large investments within the reach of those with talent and innovation. . -The current global economic situation. Cost savings and the need to move these from fixed to variable items will be decisive in the decision of many institutions to adopt this model in terms of cost savings and operational efficiency.However, although they are very important, they will not be crucial to overcoming the human factor which is so decisive in these decisions. The fear of losing power and the lack of experience and training in technology make the lack of confidence a key factor to overcome. Additionally,the network data protection legislation in many countries is very immature. Therefore there is a great challenge and great opportunity for all to develop reference frameworks. They now have more value than

For Peer Review

ever. It is necessary to help our users create value by improving the operation and management of its relations with our institution. In the industry there are obvious examples such as the widespread Software Factories serving as a service model for the large consulting firms in Europe and the US, where older models such as CMMI and the management of projects have been crucial to developing a framework of trust in the always complex relationship with service suppliers.

However, contrary to popular belief, Cloud Computing is not just for large corporate groups. Small organizations can also benefit from the savings arising from its use. Moreover, many are forced to use this technology given its cost saving possibilities, in addition to the manner in which it improves their services, allowing entities to experiment with new technologies at a moderate price. Therefore the choice of whether or not to use "cloud computing" must be analyzed not only from the standpoint of current cost improvement but also as a forward looking investment in the integral management of the organization's information.

For Peer Review

REFERENCES

1. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter Cloud Computing: A Practical Approach ISBN: 0071626948. Mcgraw-hill. Osborne Media. 2009.

2.Christopher M. Moyer ."Building Applications in the Cloud: Concepts, Patterns, and Projects" ISBN-10: 0321720202.Addison-Wesley Professional. 2011.

3. Choubey R., Dubey R., Bhattacharjee J. A Survey on Cloud Computing Security, Challenges and Threats. International Journal of Engineering Science and Technology (IJEST), Vol. 3, No. 3, 2011.

4.CSA Top Threats to Cloud.Computing.V1.0. http://www.cloudsecurityalliance.org/topthreats/csathreats.v1.0.pdf.

5. Creeger M. Cloud Computing: An Overview. ACM Queue, Vol.7, No.5, 2009.

6. Ronald L. Krutz, Russell Dean Vines Cloud security : a comprehensive guide to secure cloud computing ISBN: 978-0-470-58987-8 .Wiley, 2010.

7. The cloud market in 2012: Through the eyes of experts. http://searchcloudcomputing.techtarget.com/feature/The-cloud-market-in-2012-Through-the-eyes-of-experts.

For Peer Review