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Paper proposal form

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Proposal

Title: Cloud computing as a solution to difficulties in quality projects with independently located members of a managerial team. Experiences in administration and research management projects.

Abstract (150 words max):

Providing data and transforming them into valuable information can prove quite a complex exercise especially when the managers due to use them are independently located. Under such conditions, quality assurance becomes a real challenge.

Starting from feedbacks in a research management project as well as in setting up a network of quality managers in France (RELIER network), the purpose of this article is to show how the use of new technologies in computer framework guarantees the fundamental concepts of quality system.

Text of paper (3000 words max):

Preamble

Providing data and transforming them into valuable information can prove quite a complex exercise especially when the managers due to use them are independently located. Under such conditions, quality assurance becomes a real challenge.

Starting from feedbacks in a research management project as well as in setting up a network of quality managers in France, the purpose of this article is to show how the use of new technologies in computer framework guarantees the fundamental concepts of quality system.

Just now : with three or four people writing this article together, the question of data sharing arises at once. Usually, people use electronic mailing. The first writer settles a draft, then sends it to the other three who in turn make some suggestions. From that moment on, not just one article exists but at least four (not counting back-ups and re-writing on USB sticks).

A few questions come up immediately: first of all, who has THE last copy of the document? The answer is: NOBODY! Everyone has an unfinished version of it but nobody knows where to find the final draft. Furthermore, one can duly ask who is the legal owner of the final draft ? Who is the rightful owner of the data at that moment?

What we have just pointed out when writing an article also applies to project management and data handling. When starting on any scientific, academic or managerial project, data and indicators handling requires time and quite a number of people to work at them. How can we make sure that all the appropriate data and documents are constantly available for every person involved? How can we guarantee that we can follow up every change in any document? Who has changed what? At what time? How can we make sure that everybody shares identical data and information on the subject ? What we have just pointed out when writing an article also applies to project management and data handling. When starting on any scientific, academic or managerial project, data and indicators handling requires time and quite a number of people to work at them. How can we make sure that all the appropriate data and documents are constantly available for every person involved? How can we guarantee that we can follow up every change in any document? Who has changed what? At what time? How can we make sure that everybody shares identical data and information on the subject ?

Our different experiences, whether in research management or in leading a quality oriented network, will help us show that computing tools and information technologies based on cloud computing can be an answer to our worries, when quality projects and data handling for distant executives are at stake.



1 - Describing how to use cloud computing technology to set up a joint working space and a data warehouse available to members working on a project.

In order to manage a project, managers use joint working space based on a cloud computing technology. Such a space is set up from the start and enables to share information, exchange data among several members working on the same subject, remote work at the same time on a same document and finally share timetables. All of this can be achieved through an interactive homepage on an intranet website.

What is cloud computing ?

Cloud computing can be defined as an outsourcing mechanism presenting new properties such as a service relying on resources and equipment not precisely located (hence, the cloud). Such service can be available and charged on demand, thus immediately adapting to the client's requests.¹

Why choosing cloud computing ?

Cloud computing suppliers guarantee that such a system and the hardware are both safe so that a new strategy in data transactions and storage as well as controlled access shows up. Suppliers guarantee security from the moment data are created till they are released, whether on a technical basis (equipment follow up or change in case of damage , ISO 27002) or in terms of information system organization.

Cloud computing suppliers, like behemoth computer firms making otherwise unsecure mass market offers, commit themselves by way of legal agreements to guarantee their customers both data security and confidentiality. These agreements are based on international norms protecting intellectual property for users' data such as SAS 70 type II (<http://sas70.com/>) or ESCROW level III (www.escroweurope.fr)

The applications rely on cloud computing technologies, which means that the technical infrastructure is shifted toward the internet or what is called "the cloud". Such a solution presents the advantage of getting away with the risk in eventually losing data or seeing it accidentally destroyed. Moreover, one can gain access to the data from anywhere in the world providing an internet connection. Finally, the user's personal computer may not necessarily be very powerful as services and data are outsourced.

The benefits.

We have been using joint working space for several years in order to guarantee quality in research projects or to coordinate interrelated work and people. Cloud computer relying

¹ *A datawarehouse is an intermediate storage space from which data can be pulled out to provide information for management decision. It becomes the unique space where data are consolidated. The Data WareHouse concept was created by Bill Inmon. He defines it as follows: "a data warehouse is a subject oriented, nonvolatile, integrated, and time variant collection of data in support of management' decision."*

Data must be " subject oriented" that is to say they must be selected according to a particular purpose. Data are nonvolatile, that implies that once they are stored in that space, they stay forever and cannot be deleted.

Data are integrated which means they must be cleaned or tailored and normalized before being used. Finally, they must be time variant or historized, which means that all references to day and time must be attached to them. Cloud computing relies on shunting computer transactions traditionally hosted on local desktop computers. The concept is similar to that of an electrical grid. Computing power and information storage are provided by specialized suppliers. So that companies do not need to buy their own servers any longer. They leave that to another company which guarantees power and storage on demand.



devices can be extended to the user's intellectual data preservation. Such a solution favors quality assurance in the project and at the same time addresses various aims.

Sharing common culture, values and transparency. Working together on one, same document, sharing the same level of information and building a project together in an iterative way brings a real leverage in favor of community development or common culture. Quality culture is greatly fostered by such an organization which implements a managerial quality approach at large.

As far as transparency is concerned, data access can be totally open or partially opened to stakeholders or high ranking authorities, which enables them to get in touch with the project they fund as it further develops.

Intellectual protection by precise document dating

When a document is created or is imported into a server, it is automatically dated. It figures the day, the time, the owner. Dating is guaranteed by a trustworthy outsider which is the cloud servicing supplier. This has legal value in case of litigation. When the document is modified, all changes are registered; the user can see them and can eventually restore former drafts. This also contributes to a greater traceability, which is a point we will come back to later on.

Storing and sharing unique information.

The project is stored in the "cloud". Any member of the team conducting the project can get on line to the information it contains (timetables and diaries, meeting reports, official documents, data collections, papers in progress...) All documents, whether finished or in progress, are available to the members of the team working on the project in the joint space, mailing lists, data bases, newsgroups.

Project tracing

All the information a project contains being stored in the same space, every person who has been granted access to it can see how it develops and trace it back if necessary. Besides, a contents management system (CMS) presents one great advantage, that is, keeping different states of one same document. One can therefore see how, when and by whom it has been modified all along from the start to its present state.

Securing information

In that matter, we all know that our laptop computer may be stolen or that it may be broken. How many years of research work have been lost because of an accident or a breakdown? With technological innovations going on, information is more and more often stolen, particularly when travelling abroad. Our partners' servers can be reached worldwide. Some colleagues work on delicate data in troubled countries. They store all their work in these servers and only keep in their laptop memories operating systems tools and minimum basic working data.

Cyphering communications and data transactions

With still the same purpose of achieving a high degree in security and confidentiality, all accesses to data and to joint working space are coded according to the 128Bit SSL protocol. Any connection is cyphered by RC4_128, SHA1 is used to certify messages and RSA for the key exchange method.

A very simple use

This solution is very simple to use. Only three or four hours are needed to create such a space and two more hours to teach members of the project team who will be its active users. No further training is necessary to use such a space: it is intuitive, members are signaled when mails come in, it connects easily with other office software applications. It is handy and user-friendly. And the website is administered by the project members themselves.

Such a solution is used in research quality project management among higher education institutions, for national and international projects (such as PACTE research center in Grenoble, ...) It is also used in international scientific meetings, conventions and symposiums. It enables us to keep everything secured and to develop a common quality



approach. This highlights not only the work but also the researchers and partners involved in a project the quality of which is acknowledged and secured.

2 - Using a data management system such as a datawarehouse.

One of datawarehouses singularities lies in their ability to handle at the same time very important quantities of unorganized data stored among various geographical locations. Sharing storage and joint working space can thus be achieved through a cloud computing datawarehouse, with a secure access limited to authorized members. Linking cloud computing and a datawarehouse becomes precisely interesting for its capabilities in handling unorganized data, selecting and restituting them according to key words and references. Easier to use than a classical data base, this combination enables however a well-structured data organization jointly defined by all project members.

We are using here a data base as a documentary collection. We can store a document along with all the information related to it such as metadata and tags (like we are using here a data base as a documentary collection. We can store a document along with all the information related to it such as metadata and tags (like those found on blogs). Search engines associated to a data warehouse allow us to find documents by using key words, through usual requests.

All these devices are being used to manage research quality projects.

3- Feedback with the RELIER network.

The network « **RE**seau qua**LI**té Enseignement supérieur et **Re**cherche (RELIER) »



has been created in the wake of a convention on quality in French higher education held on December the fifth 2012 by the will of what we call the "CPU", (which stands for conference of university directors or presidents) and quality managers themselves. The purpose was to put together our various approaches and abilities in higher education and research quality management. The network wants to stand at a crossroad between the political chief decision makers and those who make things work every day, and provide solutions towards constant improvement.

Its members are administrative managers as well as professors, all quite involved in the leadership of their institution and in making quality really work.

It is led by a seventeen members steering committee coming from all over the country, and represents all types of higher education structures and functions (members of the elected executive board, administrative head officers, directors of various back offices).

The steering committee gathers once every six weeks approximately for a whole working day. But all members keep on working together in the meantime at a distance to make the network thrive. The solutions we have adopted to deal with the problems of independently located project members are all based on cloud computing technology.

Our basic tool is our intranet website. There we can find:

- a blog where each member can make remarks, give some information to the others
- a shared diary that can be connected to our personal one (when compatible), a list of all members' names et contact numbers
- a list of all going-on projects with things "to do" and where the projects stand
- a short resumé of each committee member they can update



space where meetings reports and oral presentations by committee members or guests can be stored.

Next comes our internet website www.relier-univ.fr which is directly connected to the following address <https://sites.google.com/a/iepg.fr/relier-univ/> and is an extended address of an intranet website based on the same technologies. The site can be read all over the world but only committee members can write in it.

Finally, we also use a data warehouse. All members can store, change and modify a document (at the same time or at different times). All documents are tagged with key words the committee has selected so as to make it easier to find all that relates to a specific subject. Cloud computing devices are all associated to key words or full text research tools.

All this proves essential in document writing and collective work. We use them every day together with audio or videoconferences.

To conclude, we would say that if sharing data is not an easy thing when collaborators are geographically distant, new technologies like cloud computing enable each one to get constantly fresh information, modify it and keep track of the modification as well as that of his or her colleagues. Modifications can occur simultaneously and at a distance, thus implementing perfect collaborative work. We believe that a project draws higher benefits from a quality production obtained in good conditions and with greater involvement from all actors.

Questions for discussion:

- How can we arouse trust in such devices among professors, project managers or stakeholders such as outside partners or funders?
- How can technological tools play a part in achieving quality?

Please submit your proposal by sending this form, in Word format, by 2 August 2013 to Ivana Juraga (Ivana.Juraga@eua.be). Please do not send a hard copy or a PDF file.