THE PERSPECTIVE OF ARCHITECTS AND DESIGNERS IN INDONESIA ABOUT THE USABILITY OF CLOUD STORAGE TO SUPPORT THEIR ACTIVITIES

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ABSTRACT

In line with the rapid development of advanced internet, online digital storage which is further also known as cloud storage file system is increasingly becoming popular. On the other hand, especially in the urban areas of life also brings a shift in the behavior that led to the global life. Demands of high skills and perfection in a work or education have realized a joint effort. Based on Willcocks (2011),it is clearly conveyed that to cloud adoption in the field of architecture only uses up to 53% reach. The numbers are believed by many parties will continue to move up. This phenomenon and new problems encourage the emergence of question about how to what extent the usability of cloud storage in the perspective of users, which in the subject of this article, the restricted scopes are in the field of architecture and design. Thus the aims of this study are to evaluate the activity of architects or designers in the work that has been through the support of cloud storage and to find the development opportunities that can be recommended to the cloud storage provider about how much effort is optimal on a cloud storage technology for architects and designers.

Keywords: cloud storage, usability, architect, designer.

INTRODUCTION:

In the year of 2011 is the new era of cloud computing technology in Indonesia. Dropbox, Google Drive, SkyDrive and iCloud became popular names in recent years. With the rapid development of advanced internet, online digital storage which are also known as cloud storage is becoming popular. Indonesian people as users are spoiled by cloud access for service activities at anytime from anywhere. They can also increase or decrease the use of computing resources and services in a flexible and easy way. They do not need to make a large initial investment of computing resources, space, power, and cost of maintenance staff to manage systems, networks, and databases (Kim, 2009). In principle, it is also perceived by many corporations that run the business are no longer based on a local computer or remoter server. They have the potential to run data center as they are just like Internet companies. This makes the enterprise use the resource in the application that is needed, and access computer and storage systems according to the needs. (Zhang et.al, 2010).

On the other hand, especially in the urban areas of life,it also brings a shift in the behavior that led to the global life. Among them,it is very encouraging progress of the increasing acceptance of cloud storage that is the need to share and collaborate. Demands of high skills and perfection in a work or education have realized a joint effort. Collaboration skills is an important aspect of personality, and needs to be owned by every person in the social life in today's society (Apriono, 2012). Development of education in Indonesia has been already following the cooperative learning and collaborative basis. It also leads to the social aspects of treatment, such as respect for others, empathy for others, work together with other people and reduce the negative aspects of the competition, as well as suggesting various other positive behaviors. (Muslih, 2013).

Based on the needs and conditions of the above mentioned, it is inevitable that cloud storage is currently adopted by various corporate fields. It is also said by Lamba & Singh (2011) which states that Cloud computing ultimately help the organization save costs and create new business opportunities. They give an example, in his research, especially in the field of education and the public sector. Another thing that also supports is the opinion of Willcocks (2011) which is based on his research with the London School showed that Cloud Storage has been adopted by a variety of fields with different levels.

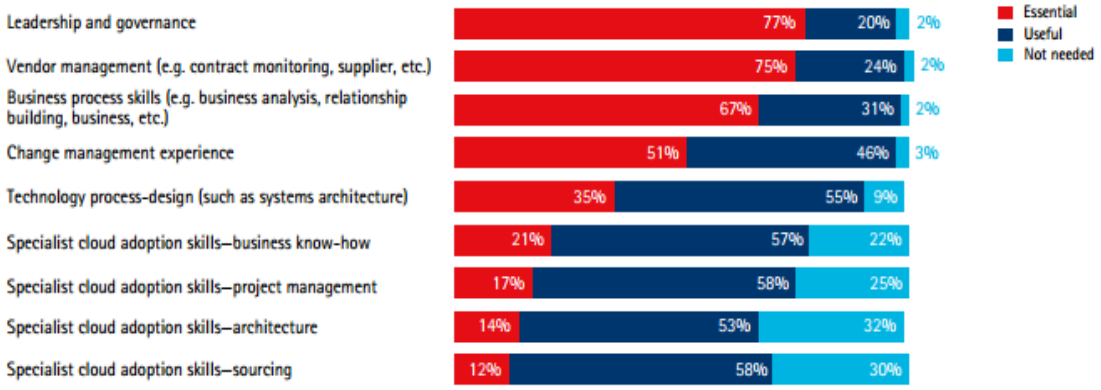


Figure1. Cloud Storage Adoption. Source from Willcocks, L., Venters, W., & Whitley, E. (2011)

Based on data of Willcocks et.al (2011),it is clearly conveyed that to cloud adoption in the field of architecture only uses up to 53% reach. The figures are believed by many parties will continue to move up. Cloud Storage in a Cloud computing system increases rapidly, with data growing at unprecedented rate. However, along with it, has come also the problem of privacy, efficiency at the expense of resistance to the system, (Briscoe & Marinos, 2009) and that certainly pose new security risks to the validity of data in the cloud (Wang et.al, 2012). Additional problem is the subject of consistency guarantees, synchronizing the different groups within the cloud platform, interoperation and standardization (Chen & Deng, 2009).

This phenomenon and new problems encourage the emergence of the question about to what extent the usability of cloud storage in the eyes of its users, which in the subject of this article, the restricted scope of architecture and design. Usability is the one of four key factors defining characteristic of Cloud service facilities. Those four key factors are necessity, reliability, usability, and scalability. (Katzan,2011). The reason for choosing architecture and design is at least writing implementation of cloud computing in this field.

Thus the aim of this study are to evaluate the activity of architects or designers that has been through the support of cloud storage and to find the opportunities that can be recommended to the cloud storage provider about how much effort is optimal on a cloud storage technology for architects and designers.

RESEARCH METHOD:
RESEARCH DESIGN:

The approach used in this study is a qualitative approach through usability interviews. Qualitative approach is a research paradigm to describe the events, behaviors, or circumstances at any particular point in depth in narrative form. Usability interview is a joint activity between direct observation and interviews over a participant who interact with the interface technology or products tested. In this research, interviews were conducted as a usability evaluation process (Maulana, 2009) and exploration (Rubin, 1994; Fu, 2013) to determine how the acceptance and the possible development of cloud storage in the perspective of the users, they are architects and designers.

RESEARCH SITES:

Research activities focused in Surabaya as the second fastest growing city after the capital city of Indonesia, Jakarta.

TYPE AND SOURCES OF DATA:

The type of data expected is the activities of the participants recorded in the interaction with Cloud Storage, Field Interview Notes and other supporting documents needed (collaborative and individual works of the participants). Based on these data types, the data source are the means of inspiration and information to be derived from elements of human and non-human. The human element as a key instrument is the researcher involved directly with elements of informants / participants, while the non-human element can be derived from the generated artifacts and the underlying participants to conduct its activities.

PARTICIPANTS:

Because the depth research study is based on the evaluation and exploration process, the participants are determined by purposive sampling approach with persona research. The participants were selected based on the profile that corresponds to the purpose of this research and are willing to give researchers access to their daily activities. In general, the participants persona profile are shown in table 1.

Table 1. The Participants Profile

	Shirleyana, 35 years old • A Higher Education Lecturer in Architectural Engineering with specialization in Architectural Design • A professional and practitioners in architecture and residential projects
	Ririn Dina Mutfianti, 46 years old • A Higher Education Lecturer in Architectural Engineering • A researcher in the field of Landscape Architecture • Once upon a time involved as a professional freelancer in the project of architecture and Urban Planning
	Ary Dwi Jatmiko, 39 years old • A Higher Education Lecturer in Architectural Engineering • A graduate of Product Design and Technology Management • Having business in the field of document management, human resource development, and expedition • Volunteers for the social activities in entrepreneurial mentoring
	Faza Wahmuda, 31 years old • An Lecturer in Higher Education for Product Design Department • A Graphic Designer and have a business in the field of Photography • Once upon a time involved as a professional freelancer in the project of Advertising and Event Organizer

Astri Anindya Sari, 28 years old
- A Higher Education Lecturer in Architectural Engineering
- A researcher in the field of Architecture Behavior
- Once upon a time involved as a professional freelancer in architectural project

DATA COLLECTION PROCEDURE:

Data collection is done in several ways called usability interviews, namely 1) observations by immersing in the environment of participants and observe details the interaction of participants with the cloud storage file system, 2) an open and in-depth interviews through guidance with individual participants, peer participants and the experts; 3) Documentation of the participants artifacts.
Based on the usability of cloud storage research activities that have been carried out by Mueller (2012) and Fu (2013), the open interview guide that was developed as follows:

a. How is the knowledge of participants on cloud storage file system?
b. How much activity had the participants done with the cloud storage file system?
c. How do the participants value on the benefits of cloud storage file system?
d. How are the expectations of the participants on the cloud storage file system?
e. How familiar are the participants to interact with the cloud storage file system?
f. How satisfied are the participants to interact with the cloud storage file system?
g. How do the participants do in spreading cloud file storage system?

DATA ANALYSIS:

Analysis is done open ended it means it is adaptive to change, improve, and enhance based on new data entry. The steps performed are 1) phase of data collection both descriptions and reflections / interpretations; 2) data reduction phase through process simplification / categorization of themes; 3) the stage of presentation of information and drawing conclusions stage / verification that spawned action models and solutions chance to be recommended.

RESULTS AND DISCUSSION:

After going through the process of usability interviews to the participants, fellow participants and experts, all the data collected are field notes, observations documentation, interpretation or reflection on observation, facts and artifacts as well as all other creative results. All of this data can be an inspiration as well as proof of the user experience of cloud storage system files. These data then become the basis for the discovery of an insight that begins through the process step by step to reduce and perform the theme categorization of all data.
As a general overview of the data that have been obtained are as in Figures 2 to 4 below.

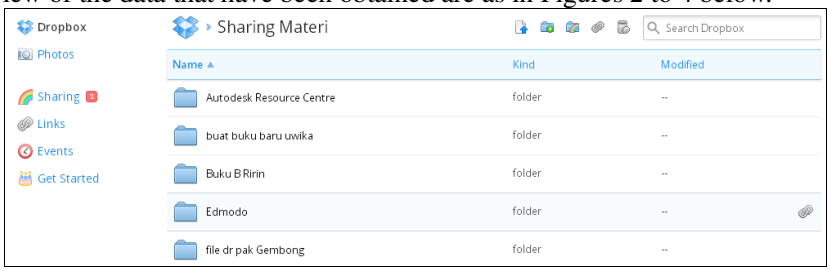


Figure 2. The Interface of DropBox with Materials Shared in there

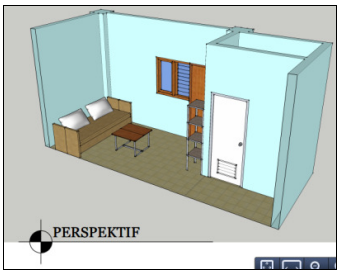


Figure 3. Interview data were reduced and then categorized with specific themes

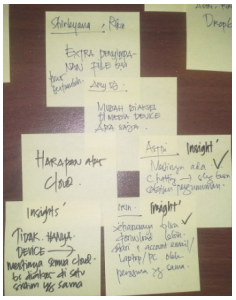
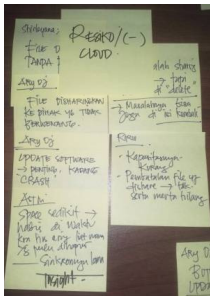


Figure 4. Artifacts in the form of design work as a distributed file



INSIGHTS OF CLOUD STORAGE USABILITY:

Insight is the information we get through the process of finding out in depth and holistic background deeds, thoughts and behaviors associated with the products that we observe (Maulana, AE, 2009). After a deep study of all the data that have been collected, including insights obtained as follows:

1. Cloud File Storage System which synchronizes files is quite long.
   All participants agreed that in fact a lot of the benefits of the Cloud File Storage System, namely 1) can save hard disk storage space, 2) can be accessed anywhere, anytime, through a variety of media, 3) do not need flash disk to share files, and 4) is simpler than send via email. From all of them, the automatic synchronization of shared files becomes their constraints because sometimes it takes quite a long time.
   > "I'm fairly satisfied with DropBox facilities but lacking much space it provides. So, I had to frequently check which files need to be removed. Then it affects the synchronization of time so as that makes the weak internet to be more slowly." (Astri)
2. All files should ideally be stored, deleted, and shared but should need confirmation mechanism and should avoid the kind of file-based video.
   All participants have been used to store all kinds of files and share them with other colleagues, but they often face multiple obstacles during cancellation or deletion of files. On the other hand, sometimes it also affects internet speed file-based video calling, so they end up avoiding storage of video files.
   > "I used to store work files including correspondence, urgent files, photos, e-books, documents, presentations, company profile, e-brochures, and so forth." (Ary)
   > "I used to save the files to group them into administrative files, file research reports, file student assignments, and course material." (Ririn)
   > "I've had an error for distributed file storage. I intend to remove it but it is not at once making the file immediately erased." (Ririn)
   > "Erased Files without consent." (Shirleyana)
   > "If there is data to be changed or removed by other colleagues, it's often the condition without notice." (Astri)
   > "The film may be stored but long sync so I became lazy. I better copy video directly to the Flash Disk." (Astri)
3. The installation and use of the interface folder, a clear sequence of steps and the less precisely the stages operate it easy to operate.
   With the principles of simplicity and the concept of 'if ever be one click, why even two clicks "became the basis of the development of cloud storage. Selected as DropBox Cloud Storage facilities that are considered familiar than Google Drive, iCloud and SkyDrive.
   > "Simply download DropBox and accept the invite from a friend. For self-created folder, could invite email to colleagues who are invited to join." (Ririn)
   > "I feel the easiest DropBox because quite clearly the steps and immediately installed in our Computer Folder. It is quick to access, I found precisely in iCloud installed on my iPad. While Google Drive, I was confused to get used to working with the service." (Ary)
   > "Every job or important events, I make frequent use DropBox with other colleagues and eventually become familiar." (Astri)
4. Cloud Storage is not provided with the means of facilitating communication among team members
5. Cloud Storage is not provided with the means to facilitate communication among team
   Participants often complement his collaboration work with aids communicate with each other through SMS on Mobile Phone. It is made possible to confirm the repair file content in real-time while working together online.
   > "It should be cloud storage is equipped with a means of chatting so I can directly give announcements or messages related to file." (Astri)
6. Cloud Storage space is often limited and accessible with one account so that it becomes its own difficulties at the moment have more than one account.
   > "I have a lot of accounts with different email to get more space on DropBox capacity. I hope all of this account can be accessed together in one computer with the same user. "(Ririn)
   > "I hope to provide extra DropBox storage capacity." (Shirleyana)
7. Security issues of concern to not carelessly split the data in the Cloud File Storage System.
   > "Cloud Storage software update should be considered because it sometimes happens 'crash' is not necessary." (Ary)

"I see the importance of the file. If the highly confidential nature, I would not use cloud services. The development of cloud computing business model will be like Amazon EC2 is booming these days. "(Faza)

8. Circle of people the user to determine the dissemination and how the user knows in the end instead of just as a Cloud Storage Application in a device or gadget.

Circle of people who influence the participants were more than colleagues in the work environment and colleagues from their primary environment environmental activities other than siblings or relatives.

"I know about cloud storage from fellow lecturers. And I used to share files with colleagues, students and brothers. "(Astri)

"I know of a colleague who invited to share in a single folder. I myself used to share files with fellow faculty colleagues, students and co-project. "(Ririn)

"I found out about it from a co-lecturer cloud. And I used to share with fellow lecturers and fellow architect. "(Shirleyana)

"I know this from Bukik Cloud Storage, a business friend of mine. And I believe that this technology is still more effective than disseminated through peer through the device as evidence even though I have iCloud on my iPad, not necessarily I also use it when I do not know what to use. "(Ary)

THE OPPORTUNITIES TO DEVELOP THE CLOUD STORAGE FOR ARCHITECT AND DESIGNER:

Opportunities will be obtained if the ability of actionable insights and powerful enough to finally come up with ideas. Actionable ideas and success starts with the right questions, which identify important opportunities through insights. By putting the phrase the question "How might we ....." in front of the verb insights, then we can plot multiple opportunities and ready to be a priority choice.

After a deep study of the approach to the question "How might we ...." in any insights, it can be formulated the multiple opportunities that can be mapped in the model solutions and opportunities action as follows:

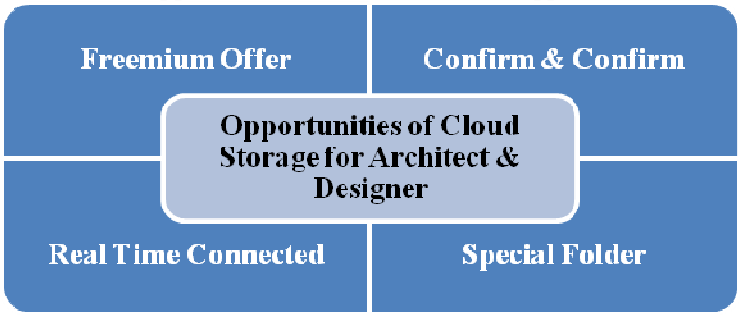


Figure 5. Diagram of opportunities to develop the cloud storage

FREEMIUM OFFER:

These opportunities arise as a basis for the challenge "What if *freemium* cloud storage in the classroom while providing the best service by giving users access to all the facilities for his account (which is limited capacity space) in the user module alone?"

This is certainly a thought for the service provider that the storage capacity that is given free aim is to attract the users of this *freemium* class will eventually is bound by technology and emotion, so that volunteered to move to the Premium class. To some users as well as the participants are used to form the mindset that as long as it can be free why should use paid. This is understandable, especially when linked to the issue of copyright and piracy as an instant solution, then as much as they might in the end choose the applications are free, although still legal. So sometimes the concept of free or paid it in the eyes of the users of intellectual material is not always a physical as well as how many dollars to be paid to be able to enjoy the facilities provided by the provider.

Based on the user mindset and conditions like that, and then ideally offer the free facility to access all user accounts in a single module alone can be the following options:

a. How you might as a user invites other users in a certain amount, and then you will get free access to a number of service specific accounts in the user module?
b. What if you as a user to buy a number of gadgets that are included in the recommendations of a collaboration cloud storage provider, then you will get a certain amount of free capacity and free access to a specific account in a user module?

c. What if you put a link of a cloud storage provider in your blog, then you will get free access to a specific account in a user module?
d. All quotes in the directing class *freemium* users will enjoy the special service provider, while the provider itself still benefit by acquiring through other sources.

CONFIRM AND CONFIRM:

These opportunities arise as a basis for the challenge "How users can approve in advance if there are files that should be removed and if any other members have uploaded file and distributed to ensure it is the correct file?" Some providers have complete facilities actually notice when a file is deleted and no verification of data sources when users want to upload it but it was not enough. Something that can be recommended to be addressed is as follows:

a. Notifications of deleted files are still needed as part of the procedure, especially when the user is directly connected to the internet. This step should have immediately followed up by sending a confirmation to the user, whether the user is concerned agree if the file should be deleted within storage. If he agrees, then it would not be a problem but if he does not agree, the file should remain as personal as the status of the file is no longer shared, with a storage capacity of course taking into account that he had.
b. The providers only pay attention to the verification of data sources, such as where the data came from and so on, but in order to maintain security, users verified with the question, "Have you convinced that the file titled ..... Is the correct file to be stored or distributed in the cloud storage? "This is at least in accordance with security procedures, privacy and avoids errors sharing files.

SPECIAL FOLDER:

These opportunities arise as a basis for the challenge "How can users quickly synchronize files in cloud storage?" Users who rarely update and suddenly when connected to the internet, they feel high emotions because his PC must have to synchronize first. This interferes with the activity at the time browsing or other multitasking.
Some ideas that may be recommended include:

a. Providers should categorize system based on the folder with the general behavior of the user, consisting of shared files and personal files are not to be shared.
b. To support the process of synchronization, preferably for users who rarely update given priority choice what files will be synchronized. It is similar to confirmation at the time the user is offered a priority for the process of updating an application or operating system. With this option, the user can set the time synchronization in accordance with his will.
c. Education can also be applied to the user at every opportunity in the windows notification or confirmation of the importance of considering the minimum number of files that will be uploaded to the cloud storage.
d. Especially for video files can begin to think about the approach of a separate folder so that users can synchronize categories, the minimum recommended number of files and the choice of time it chooses.
e. Special folder that already categorized this should still consider the interface is clear and easy to generally accept by the user in a variety of platforms.

REAL TIME CONNECTED:

These opportunities arise as a basis for the challenge "How can users still communicate between the members when collaborating or communicating with prospective members to be invited?"
Of research Mueller, W. A. (2012) found that invites and dissemination activities in cloud storage is mostly done via email. Activities and updates distributed file synchronization can indeed show evidence that the progress of collaboration going on but it does not show in real time, whatever the subject in question. Under these conditions, some of the ideas that could be opportunities are as follows:

a. Instant Messenger or Chat can be attractive options for delivering messages is included as a feature on file collaboration.
b. This feature can be directly performed simultaneously with the notification or enter the email notification other users.

CONCLUSION AND RECOMMENDATIONS:

Architects and designers are working more as teams who collaborate; therefore it does not deny that cloud computing technology has helped their work activities. And of the results of usability evaluation, cloud file

storage system provides a lot of opportunities to be developed for further research, especially in the increasing usefulness to professionals in the field of Architecture and Design. Some idea of the opportunities that may be recommended include 1) attractive Deals in class *freemium* to increase user loyalty and mutual benefit between the provider and the user, 2) Notification and Confirmation Repair mechanisms at work Collaboration; 3) Categorization of Special Folders for easy synchronization and storage types large files, such as video, 4) addition of communication features that are instant and real-time collaboration to support progress.

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