ENACTING PERSONAL KNOWLEDGE MANAGEMENT & LEARNING WITH WEB SERVICES INTEROPERABILITY TOOLS

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Abstract: Nowadays, learning is continuing and seeks to selecting suitable tools to support better learning. Learners are discovering new uses of the technologies for their learning by building their own personal learning environment and network (PLE&N). Many of these tools are Web 2.0 tools, including discussion forums, file/video sharing, RSS feeds and social networks. However, the existing tools are loosely connected. It is time consuming to manage them. This paper discusses the use of PLE&N with a web services interoperability tool, IFTTT (aka If This Then That), which bridges the web services. The benefits of how a PLE&N with IFTTT is discussed to support personal knowledge management for better learning. Individual knowledge workers are continuing being empowered by such Web 2.0 tools in the cloud to pursue personal goals and aspirations.

Keywords: Personal Knowledge Management; Life-long Learning; Personal Learning Environment & Network; Web Services Interoperability; IFTTT

1. Introduction

In the modern knowledge-intensive era, people are required to learn continuously in order to stay competitive. Learning is not restricted to the classroom and to formal learning inside learning institutions, it an activity which happens throughout life, at work, play and home [1]. Lifelong learning is an ongoing, voluntary, and self-motivated pursuit of knowledge for either personal or professional reasons [2]. However, learners are facing more challenges and changing their learning trends. These challenges include unstructured and fast-changing information, and information overload. Situations that people have to tackle are often novel and they have to search for information to support decision-makings. The amount of information available is huge, making it difficult and time-consuming to locate the right information and digest it [3].

Therefore, life-long competence development has become a major challenge to educational systems that have not changed their educational policies and pedagogical models to support life-long learning [1]. There is an increasing demand for new approaches towards fostering life-long learning perspectives. Emergent Web 2.0 concepts and technologies are opening new doors for more effective learning and have the potential to support life-long competence development [1]. For life-long learners the first generation Internet allowed easy access to a vast range of published materials. The second generation Internet allows them to contribute to it. This ability for new life-long learning communities to participate and create the new web has led to a whole generation of new socially based tools and systems. Learning is becoming more learner-centric and network-based [4]. There is an increasing trend that people learn from trusted networks, as knowledge is distributed across connections and networks [5][6]. Learners may not be efficient enough to keep up with the pace of emerging knowledge. Learners need to develop their personal learning systems to integrate and foster learning activities [3].

Personal learning environment and network (PLE&N) is a learner-centric platform fostering self-regulated and network-based learning by aggregating a list of social web services. Learners can customize which tools best fit their life-long learning purposes. However, many of the existing services in PLE&N are loosely connected. It is time consuming to manage the list of services. This paper discusses the enactment of a PLE&N with a web services interoperability tool, IFTTT, to solve this problem. The benefits of how a IFTTT-based PLE&N is discussed to support personal knowledge management for better learning.

2. Personal Knowledge Management (PKM)

A number of definitions regarding Personal knowledge management (PKM) exist and there is no universally agreed definition. People have also been practicing activities related to PKM without articulating the term [7]. Generally speaking, PKM is a collection of processes that a person uses to gather, classify, store, search, retrieve, and share knowledge in his or her daily activities [8] and the way in which these processes support work activities [9]. It is a response to the situation that knowledge workers increasingly need to be responsible for their own growth and learning [10]. It is a bottom-up approach to knowledge management (KM), as opposed to more traditional, top-down KM [11].

Technologies facilitate the adoption and practice of PKM. Therefore, selecting and using appropriate tools are crucial for effective PKM [12][13]. Advancement in technologies has given rise to Web 2.0 tools that are online applications or platforms where individual users can interact and collaborate with each other. The rise of mobile devices allows users to have access to learning resources and applications at anytime and anywhere, and hence support self-regulated learning [14]. Self-

regulated learning is the ability to be fully aware of the need for further learning and to accomplish learning proactively [15].

People often have to tackle new problems and they need the right information for decision-making. However, the problem of massive information overload makes it difficult and time-consuming to locate and digest the right information. Jarche recommended that people connect with subject matter experts and get advice, and he suggested that the value of knowledge is enlarged when it is shared among communities [16]. People co-learn and locate expertise in the communities.

3. Personal Learning Environment & Network (PLE&N)

Knowledge is constructed through the dynamic interaction of new information and existing knowledge, and finally to connectivisim, in which learning occurs through social contact. Knowledge resides in a network and one needs to develop and expand a network to leverage on the collective wisdom, and to do so on a continuing basis [3]. Personal learning environment and network (PLE&N) is a learner-centric platform fostering self-regulated and network-based learning [5][6]. Another similar definition of a personal learning environment is the "combination of different tiny applications" which is "within a framework and with strong relationship to learning aspects" [5][14]. PLE&N is a generic term and a concept instead of a specific software package. As such, many different variants of PLE&N systems, like personal knowledge environment [5][15] and personal knowledge networks [17][18], exist in the realm of PLE&N. One of the key focuses of PLE&N is the use of appropriate technologies especially Web 2.0 tools. Advancements in technology provide a variety of tools for people to develop their own learning systems. Many of these tools especially Web 2.0 tools, which are pervasive, ubiquitous and bottom-up. Learners have the freedom and responsibilities to decide and select which tools best fit their learning purposes. They can also use tools to build up networks for co-learning and locating expertise. As long as they subscribe to a common core of tools, individual users can add, change, or remove other tool(s) from their PLE&N anytime yet preserving the connections in the learning network. The idea of PLE&N is also based on being able to aggregate different services.

PLE&N also supports social and lifelong learning. It does so by functioning like a semi-automatic bulletin board with pre-calibrated incoming quality and relevant articles. These articles can be annotated, tagged, commented on and forwarded for discussions. Learners are not restricted to students and teachers but also include selective graduates and experts from industry. Typically, teachers help to review and safeguard the quality and relevance of the incoming articles, annotate and articulate them with official teaching materials in the classroom. Together, these learners continue to engage in their own customized co-learning environment after school. They learn from their teachers, from their peers and from other parties (e.g. graduates, practitioners) who were admitted into the network. The community of learners also helps to combat information overload by filtering out non-core or less relevant materials.
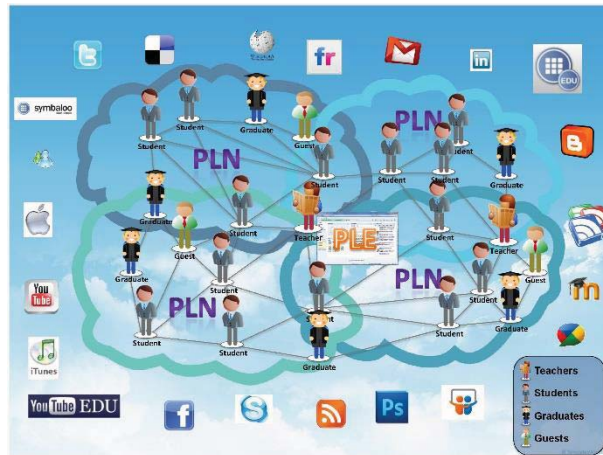

Figure 1 A PLE&N

4. Web Services Interoperability

Recently, a new category of web services interoperability tools has emerged. In particular, IFTTT which stands for "If This Then That" [19] is a representative one. IFTTT was developed by Linden Tibbets [20] and launched in 2010 [21]. It is a service that enables users to connect different web applications (e.g., Facebook, Evernote, Weather, Dropbox, etc.), which IFTTT named them as "Channels", together through simple if-then conditional statements known as "Recipes". Users can create or share personal recipes to meet their needs. As of this date, there are 115 channels available. Recipes are a combination of a Trigger and an Action from Channels. The "this" part of a Recipe is called a Trigger. An example Trigger is "I'm tagged in a photo on Facebook". Pieces of data from a Trigger are called Ingredients. For example, the Ingredients of an Email Trigger could be: subject, body, attachment, received date, and the sender's address. The "that" part of a Recipe is called an Action. An example Action is "send me a text message".

Hence, for example, you add a post to your WordPress blog, you then link to the post with a tweet, add it as a note to Evernote (a Personal Knowledge Management for collecting information gathered from online resources via different devices), or send it to Facebook (a social networking tool). IFTTT can automate as many of these tasks as it can by providing a user with snippets of code to accomplish a task without the user's intervention. IFTTT has created a couple of its own default channels for calendaring and weather. So, for example, one recipe sends an email whenever the forecast for the next day is for rain. Others send emails when new books or albums hit Amazon's top 100 list.

Other recipes include such actions as add photos from Flickr or Instagram (social networking sites for photos) to a Dropbox folder (a cloud-based shared storage area).

5. Integration of PLE&N with IFTTT

Previously, a PLE&N using Google public tools has been developed and piloted in 8 subjects for over 3 semesters, serving over 300 students and graduates at the authors' institution [3]. In the rest of this paper, 3 major improvements are discussed by integrating the functions of IFTTT with the PLE&N.
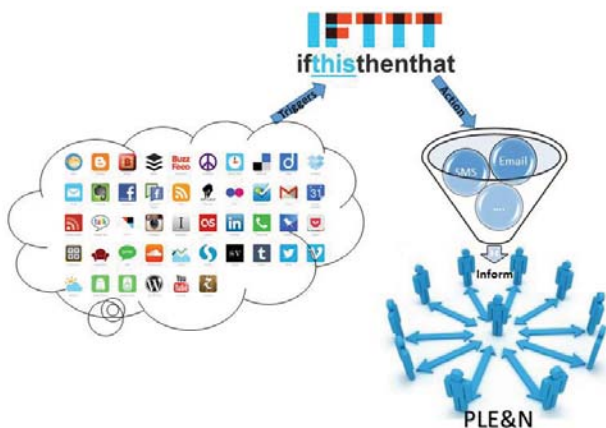

Figure 2 PLE&N with IFTTT

5.1 Improved Management of Taxonomy

By using IFTTT, files which include photos, documents, and notes can be summarized, categorized and made backups automatically. For example, Instapaper [22] is a web based reading tool which allows users to save their interesting articles, videos, cooking recipes, song lyrics, or whatever else they come across while browsing on the Internet with one click by using different devices such as iPhone, iPad, Android, or Kindle. Evernote [23] is a web service, designed for notetaking and archiving. A "note" can be a piece of formatted text, a full webpage or webpage, etc. Notes can be sorted into folders, then tagged, annotated, edited, given comments, searched and exported as part of a notebook.

By using IFTTT, the two services are bridged. When a learner uses Instapaper to read articles the titles and the URLs of the articles that the learner read can be automatically captured and save to Evernote. Hence, a summarized list of articles can be reviewed easily. Or even, users can highlight sections of articles that they particularly like and all of the highlights that make on a single article get saved to a single note in Evernote. By using IFTTT, Instapaper can send these highlights to Evernote directly using the email integration. It makes the search of information much easier from a high value subset. Moreover, users can also assign different folders based on keywords to have a better filtering and categorization of reading materials. Users can also drop notes, write reviews on their reading articles, and make a backup for their reading articles, without manually

operations.

5.2 Better Time Management

Nowadays, many people actively participate into more than one social network platform, such as Facebook, Tweeter, or LinkedIn, etc. They write blog posts frequently. By using IFTTT, it can help them to synchronize their blogs among different accounts, and provides a backup of their blogs which is easier to manage and search. Users can also set up distribution list, so that it can automatically create a weekly log of what the users have achieved.

Besides the automation of IFTTT can save the time of manual operation of copy and paste the materials among different web service, IFTTT can also support users to schedule tasks based on events or time. It can create reminders based on dates or times to remind learners to study. The difference between this and a calendar or alarm is learners can instruct it to notify them in many different ways such as email, SMS or phone call. Using the YouTube, RSS, or even twitter apps learners can save items to use later. This is great for when learners find something interesting but don't have time to review it right away.

5.3 Combat Information Overload

With IFTTT users can easily create a recipe to automate delivery of an RSS feed to a bookmarking service like Delicious, Diigo, or Pinboard; an email address; or favorite read-it-later service like Evernote, Instapaper, Pocket, or Readability.

Despite the availability of using a bookmarking service or email account to collect feeds, by using the read-it-later service to save other web content, it makes the most sense to use the same service to collect feeds. Using Evernote, Instapaper, Pocket, or Readability to receive RSS content allows users to consolidate all online reading into one app. From there it's possible to archive, favorite, manage, or share all online content in the same consistent manner.

IFTTT can also take RSS feed automation one step further. Users can create a trigger which will only fire when the feed matches a designated keyword or phrase. This allows feed delivery to be customized to include only certain feeds which match the users' interests. On the other words, after setting up a list of recipes in IFTTT, simple text matching can be applied to categorize different files into their corresponding folders based on keywords.

6. Conclusions

Personal learning environment & network (PLE&N) plays an important role in life-long learning. It encourages co-learning and combat information overload. In this paper, it is discussed that the PLE&N can work more effective and efficient by integrating PLE&N with Web Services Interoperability tool. It improves taxonomy management and time management,

and helps to prevent or reduce information overload. Further work will be done on evaluating and quantifying the benefits and usability of PLE&N by conducting surveys and assessing the learning outcomes of the students. Critical successful factors on adopting and sustaining the use of the PLE&N will be found by analyzing the questionnaires and surveys which are scheduled to be conducted in the coming semesters.

Acknowledgements

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