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## 6Napse – Platform for enterprise collaboration

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Vatcharaphun Rajsiri\* , Jean-Pierre Lorré

EBM WebSourcing  
10 Avenue de l'Europe  
31520 Ramonville Saint Agne, France  
E-mails: [netty.rajsiri@ebmwebsourcing.com](mailto:netty.rajsiri@ebmwebsourcing.com)  
[jean-pierre.lorre@ebmwebsourcing.com](mailto:jean-pierre.lorre@ebmwebsourcing.com)

\*Corresponding author

**Abstract:** A number of collaboration tools has been released since the last few years. This paper presents a platform, namely 6Napse, dedicated to enterprise collaboration. The goal of this platform is to provide an intuitive, social and collaborative platform to enterprises. 6Napse is developed on the basis of the social network and collaboration-centric concepts, whereas most of the current available platforms are focused on data or users. Collaboration in 6Napse will involve at least two people from different enterprises. The platform itself provides several native services that the members can use in order to work with others for a specific purpose. The objective of this paper is to describe in detail the concepts of 6Napse and the functionalities proposed in the platform. A graphical user interface as well as the technologies used for developing the platform will be also presented.

**Keywords:** enterprise collaboration, web-based platform, social network, collaboration-centric concept

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## **1. Introduction**

In past decades, enterprises could operate alone in relatively stable and predictable environments. The dispersal of information and the exponential emergence of new technologies have started to erode the stability of this environment. Operating in such environments is becoming increasingly more difficult.

Now the environment has completely changed and the market is more open, globalized, and competitive. Changes in market conditions oblige enterprises, particularly small and medium-sized enterprises (SMEs), to become involved in various kinds of industrial networks in order to maintain their business efficiency. Different forms of networks are emerging continuously and progressively and have greatly influenced the traditional way enterprises are run. The network structure is becoming more flexible and agile in order to be able to evolve and adapt itself regularly along the life cycle.

Besides this new trend of networked enterprises and the complexity of collaboration, new technological requirements are necessary for supporting business collaboration in networks, such as collaborative platforms. In general, business partners are geographically distributed and interact with each other frequently. The diversity of business process categories developed inside the network is as wide as the variety of types of collaboration between those business partners. Thus, collaboration needs to be supported by technologies in order to facilitate the interactions between partners, and maintain the inter-enterprise relationships.

Numerous collaboration tools and platforms are available in the current market. Most of them is focused on data transferring, for example: communication (e.g. e-mail, instance massager), sharing document (e.g. blogs), knowledge management (e.g. wiki, e-yellow pages), and project management (e.g. calendar sharing). However, many users require also a capacity to expose their own services to other users of the platform as well as reuse services exposed by others as mentioned in (Rajsiri et al., 2008).

To respond to this strong requirement, EBM WebSourcing decided to develop a collaborative platform called 6Napse in 2007. EBM WebSourcing is a SOA (Service Oriented Architecture) software provider, found in 2004 with objective to provide technological solutions for the integration of enterprise applications, for information exchange in highly distributed networks and for SME ecosystems. The main goal of 6Napse is to provide an intuitive, social and collaborative platform to companies. Whereas most of the current available platforms are focused on data or users, 6Napse is collaboration-centric. Collaboration in 6Napse involves at least two people from two different companies working together for a

specific purpose: file exchange, services usage, commercial procedure, etc.

The objective of this paper is to describe in detail firstly the concept of 6Napse. Then, the functionalities proposed in the platform will be discussed. Finally, the global architecture and graphical user interface of the platform will be also presented.

## **2. Concept of “6Napse”**

6Napse is an enterprise collaboration platform with the aim to be an intuitive, social and collaborative platform as well as to be a trustable space for members to establish (or not) commercial relations among them. So, the target market of this tool is the virtual community or group of organizations joining together in order to achieve common goals.

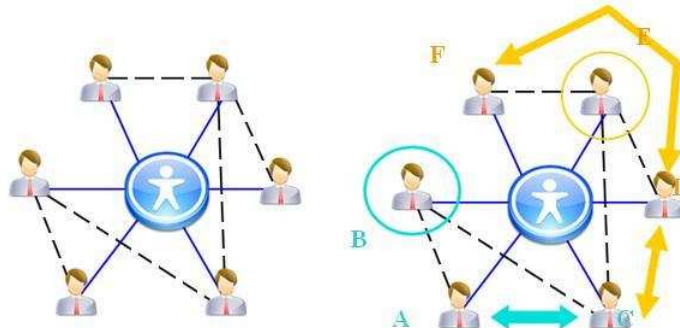
This platform has been developed on the basis of social network and collaboration-centric concepts.

### **2.1 Social network**

There are two fundamental aspects in the social network concept: user identity and the social glue. In 6Napse, users are registered as employees (or individuals), and belong to companies. Users may share only information about their business profile, but not their private information. When interactions (chat, requests, actions, etc.) take place between users, partnerships will be established between companies.

The social aspect of the platform mainly resides in collaborations: companies subscribe in order to find partners and to be found by exposing their available services. The network grows up with collaborations and registered businesses. The following figure describes the concept of social network:

**Figure 1** Concept of social network



From the above figure on the right hand side, the central symbol represents the 6Napse platform supporting a social network, on which the users subscribe (represented by full lines). These users make contacts with other users (represented by dashed lines) using the platform.

On the left hand side, the users can enlarge their network by inviting other users to be in their contact list and join the collaborations. For example, the user A can contact with C via their common contact, B. In the same way, the user C can link with D via E. Furthermore, the user A can be in the contact list of F via this following way:  $A \rightarrow B \rightarrow C \rightarrow E \rightarrow F$ . Finally, their networks glow up from user to user and contact to contact.

## **2.2 Collaboration-centric concept**

The whole platform is collaboration-centric which means all activities, directly or indirectly, deal around collaboration. 6Napse proposes two ways to collaborate with another company: 1) by using platform native services (e.g. mail, global news messages, advertisement or shared space), or 2) thanks to the services provided by companies (e.g. a company specialising in language translation may register on the platform and offer a service that translate any invoice from English/French to French/English). The second kind of services allows other registered companies to use the exposed services and collaborate with the company that exposes those services.

To support the service expose functionality, the 6Napse platform is connected to the main repository that acts like any other server. The main repository is in charge of synchronization between all secondary servers hosted by registered companies. Each server will have a PEtALS<sup>1</sup> ESB (Enterprise Service Bus) node embedded in order to provide an efficient tool for companies to expose their services.

We can summarize the principal purpose of developing such platform in three points: 1) allowing users to create their dynamic business ecosystems and communicate by using the native services of the platform, 2) allowing users to create their networks by viral propagation in the same way as Viadeo, LinkedIn, and 3) driving the integration of users' information systems in order to define business processes (e.g. supply chain, group buying, co-design) to support the specific collaborations.

For these objectives, 6Napse provides a process designer tool allowing users to build composite services based on existing ones that are exposed by the registered organizations and by the platform itself.

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<sup>1</sup> <http://petals.objectweb.org/>

### 3. Prototype

According to the Time Magazine named “You” (Grossman, 2006), “*In 2006, the World Wide Web became a tool for bringing together the small contributions of millions of people and making them matter.*” We realized the fact that the Web technology becomes more and more important that brings consumers and content together in direct communication and sharing.

The Web 2.0 technologies have been chosen for developing the prototype of 6Napse. Web 2.0<sup>2</sup> focuses on facilitating communication, securing information sharing, interoperability, and collaboration on the World Wide Web which fit the objective of 6Napse.

Indeed, the presentation layer of 6Napse has been developed with GWT (Google Web Toolkit). GWT<sup>3</sup> provides the infrastructure that allows users to build a high performance web application. It allows developers to maintain complex yet highly performant JavaScript front-end applications in the Java programming language.

In this section, we will present respectively the main functionalities of 6Napse and its technical architecture.

#### 3.1 Functionalities of 6Napse

The main functionalities of 6Napse can be described through the presentation layer of the platform’s architecture, which are: profile management, collaboration facilities and services, and process designer tool.

##### 3.1.1 Profile management

6Napse platform allows users to create their profiles concerning the general details of users themselves as well as the company they belong to. Users can visualize and update their profiles. They can also search the registered companies in order to, for example, contact or invite them to join the networks afterwards.

The company’s profile contains these following elements: general details, contact number, main activity, and services’ description. The figure below shows the company’s profile concerning the general details and activity on the right and left sides respectively:

**Figure 2** Company's profile visualization functionality

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<sup>2</sup> [http://en.wikipedia.org/wiki/Web\\_2.0](http://en.wikipedia.org/wiki/Web_2.0)

<sup>3</sup> <http://code.google.com/intl/fr/webtoolkit/>



On the activity tab panel (left side of the above figure), the activity code is defined on the basis of the NAF<sup>4</sup> (Nomenclature d'Activités Française) code. The NAF code provides the standard codes for describing business activities in France.

Besides, the company's profile provides also the description of services. The individuals of the company can add services onto the profile by themselves. The figure below illustrates an example of services exposed by EBM WebSourcing:

**Figure 3** Company's profile: service declaration functionality



These services are considered as public services that the company exposes to others. The platform will store these services in a main repository that the members can access and use such services.

### 3.1.2 Collaboration facilities and services

Once users of the platform would like to collaborate, they need to start by creating a collaboration area. The figure below shows a collaboration area dedicated to the project MIS:

<sup>4</sup> [http://recherche-naf.insee.fr/SIRENET\\_Template/Accueil/template\\_page\\_accueil.html](http://recherche-naf.insee.fr/SIRENET_Template/Accueil/template_page_accueil.html)

Figure 4 New collaboration creation functionality

The screenshot shows a web form titled "New collaboration" with the following sections:

- Collaboration type:** A dropdown menu with "Collaboration Pool" selected.
- Collaboration details:** Text input fields for "Name" (filled with "Projet MIS") and "Description" (filled with "MIS development").
- Supported roles:** Two columns of role selection. The "Available roles" column contains "Coordinator". The "Supported roles" column contains "Moderator" and "Founder".
- Supported titles:** Two columns of title selection. The "Available titles" column contains "Technology Support Coordinator". The "Supported titles" column contains "Collaboration Knowledge Manager".

A "Submit" button is located at the bottom center of the form.

This functionality is inspired by the works of SYNERGY<sup>5</sup>. This project is a research project funded by the European Commission with the aim of developing dynamic and adaptive knowledge management systems and services to enable virtual organizations (VOs) (Popplewell et al., 2008).

Here, users need to specify a type of their collaboration. Two possible types of collaboration are proposed: collaboration pool, and virtual enterprise network. A collaboration pool refers to a pool, consortium or network of potential collaborators or members for a virtual organization (VO)<sup>6</sup>. A virtual enterprise network (VEN) is a grouping of distinct groups or enterprises coming together to exploit a particular product or service opportunity, where collaboration is a key strategic objective, at all levels of management and operation (Hardy, 2008). A VEN is similar to a Virtual Breeding Environment (VBE) defined by (Camarinha-Matos et al.,

<sup>5</sup> <http://www.synergy-ist.eu/SYNERGY/bin/view/Main/WebHome>

<sup>6</sup> A VO is a short-term association with a specific goal of being active in fulfilling a Business Opportunity (BO) (Camarinha-Matos et al., 2005). A VO is a grouping of VEN members that assemble to initiate, operate and complete a specific project or VEN activity (Hardy, 2008).

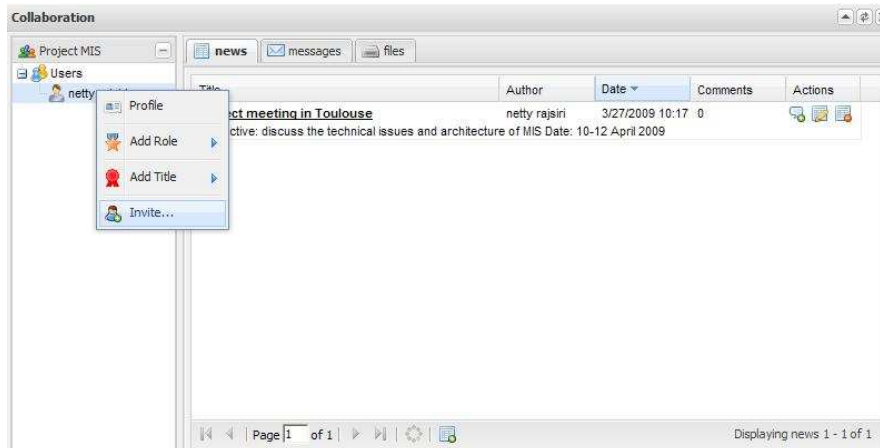
2005). A collaboration pool is a short-term association, where as a VEN is a long-term cooperation.

Then, user has to select at least a role to perform in such collaboration. There are three possible roles: founder, moderator, and coordinator. The founders are the ones who initiate the network including its purpose, vision, mission, main ideas and proposed activities. The moderator (or broker) will be in charge of managing the network. The moderator looks for business opportunities, identifying ways of using the members' capabilities to exploit such opportunities. The coordinator is responsible for coordinating a network during its life cycle in order to fulfill the goals set for the collaboration opportunity that triggered the network. (Hardy, 2008)

Finally, at least a title is needed to be selected. Two titles are defined in the platform which are: technology support coordinator, and knowledge manager. The technology support coordinator will be in charge of for example, creating infrastructures for the network. The knowledge manager is responsible for reviewing available services that satisfy the knowledge requirements within the allowed budget. (Hardy, 2008)

Users of 6Napse can use the collaboration facilities to collaborate with their partners. The figure below shows that the platform offers four main collaboration services that allow users to:

**Figure 5** Collaboration services of the platform



- invite other members to join the collaborations by specifying their e-mail address.
- post news.
- send or receive messages.

- share files with other partners: partners can upload files (doc, pdf, jpg, etc.) and create specific directories for managing the data keeping of the collaboration.

For each post, the partners are allowed to add comments, edit information, delete, and download.

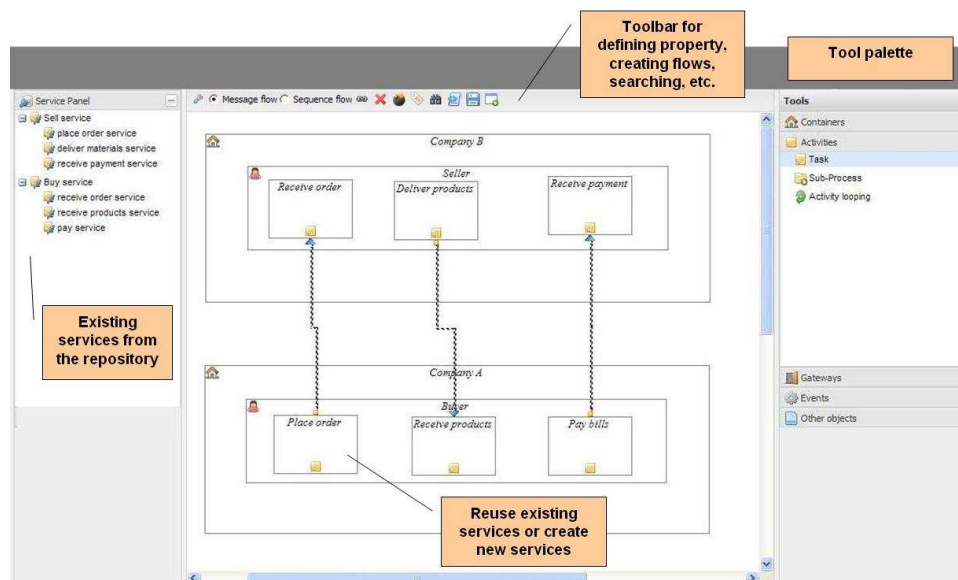
### 3.1.3 Process designer tool

The Process designer tool allows users to create business processes in a BPMN-like format. The tool offers:

- a list of existing services in the repository of 6Napse.
- a tool pallet that provides tools for creating: composites of existing services (task, activity looping, and sub-process), pool, lane, gateways, events, and data. These tools are inspired by the process modelling elements of BPMN diagram according to the BPMN specification of the OMG (Object Management Group).
- a toolbar that allows users to define properties of elements, create flows between services, search, generate an XPD (XML Process Definition Language) corresponding file, etc.
- a design space: an empty space for drawing business process by using the tools in the palette and the available services.

The following figure shows the web interface of the designer:

**Figure 6** Interface of the Process designer tool



This tool retrieves automatically the existing services from the repository of the platform. Such services are declared and exposed by the members of the platform as we mentioned in the section 3.1.1. So, the users can reuse these available services for defining business processes, as well as they can create brand new services in order to make the process orchestration afterwards. The obtained processed will be executed on a workflow engine in the PEtALS node for managing and supporting the collaboration during the runtime.

### **3.2 Technical architecture**

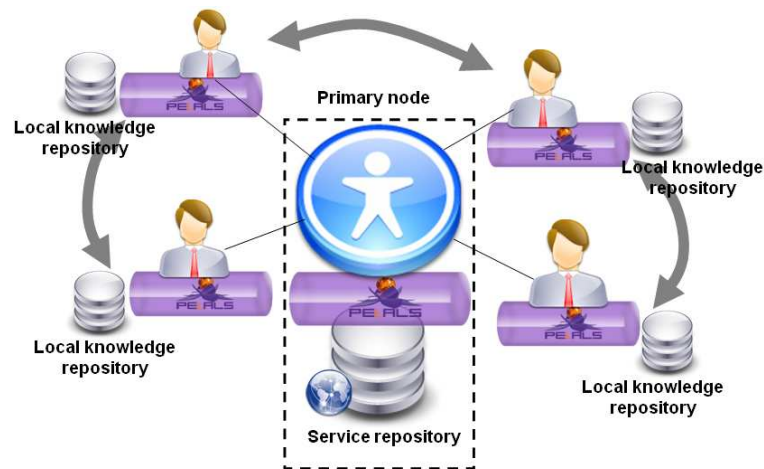
Since we intend to use 6Napse as a collaboration platform that supports groups of organizations for working together, the partners need to be connected to each other via the platform in order to exchange data and communicate. Indeed, the technical architecture of 6Napse is mainly based on a peer-to-peer architecture. The platform is made of:

- One primary node that is connected to the main repository. This node will act as any other server and will be in charge of synchronization between all secondary servers. This repository contains shared knowledge such as profiles of subscribed organizations and services exposed by the platform's users.
- Multiple secondary nodes that are hosted by registered companies and in communication with other peers. These nodes are in charge of managing local knowledge and company's services.

Each secondary server manages a local knowledge repository and can access to the central server in order to obtain information about registered companies and online users etc. Moreover, the secondary servers can exchange data directly between them without passing through the primary server. The figure below summarizes this concept:

**Figure 7** Technical architecture of 6Napse in a distributed environment

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However, to make this happen, each server needs to have a PEtALS ESB node embedded in order to deal with the interoperability of systems which includes for example data transferring between nodes, service declaration by users, etc.

PEtALS is a JBI (Java Business Integration) compliant open source ESB developed by EBM WebSourcing. It provides a distributed architecture solution enabling agility and interoperability of information flows across organizations. PEtALS is built around the concept of a normalized message router which puts together two types of plugins: binding components (SOAP/HTTP, XML, EDI, FTP, SMTP, etc.), and service engine (workflow integration, orchestration, etc.). Thanks to such concept, all information resources are accessible and exchangeable through the PEtALS nodes even in a distributed environment as shown in the above figure.

On the basis of this technical architecture, users are able to access the platform through their usual web client: no installation should be needed for a user to use the platform, but a PEtALS node is required.

## **4. Conclusion**

The objective of this paper is to present a web-based enterprise collaboration platform, namely 6Napse. It can be positioned as a runtime tool dedicated to supporting collaborations and communications between partners.

6Napse has been developed on the basis of the social networking concept and focuses on a collaboration-centric concept. The main functionalities are defined around such concepts. 6Napse proposes its own native services such as posting news, sending mails, and sharing files and

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allows members to expose and deploy their services to a repository. So, the members can collaborate to each other through these services.

Up to now, the beta version of 6Napse is available.

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