Using .tel domains to support knowledge Management

Artur Kotwica
Uniwersytet Ekonomiczny we
Wrocławiu Katedra Systemów
Sztucznej Inteligencji
Email:
{Artur.kotwica@ue.wroc.pl}

I. Introduction

THE Internet has become a motor of development of contemporary economy. In more and more cases connections with the Internet are made with the use of mobile devices, such as a mobile phone. As many as 1.6 million Poles use mobile Internet and this number keeps growing [1]. The increased importance of mobile devices has resulted in development of products dedicated to these devices. The same tendency can be observed as regards new application of Internet domains.

II. Communication in knowledge management

Knowlege has immaterial character that is of strategic importance to enterprises. According to I. Nonaka, creating knowledge is a process of interaction between explicit knowledge and tacit knowledge. These two types of knowledge may transform, which can result in transfer of one type of knowledge into the other. The Nonaka model focuses on the four ways of converting knowledge (Fig. 1):

- Socialization,
- Externalization,
- Combination,
- Internalization.

Socialization refers to the process of sharing knowledge between individuals. In this phase tacit knowledge is transferred from the sender to the recipient. Socialization should not be perceived as verbalization of instructions (e.g. in written form) but rather as common activity, such as being with somebody, spending time together, living in the same environment.

Externalization requires converting tacit knowledge to such a form that is comprehended by others, thus transformation of tacit knowledge into explicit knowledge takes place. AT this stage, knowledge is directed from a single sender to a group of recipients and the source becomes a member of the group.

Combination is a process of conversion of tacit knowledge into tacit but more complex knowledge. The key factors in this process are as follows:

- communication,
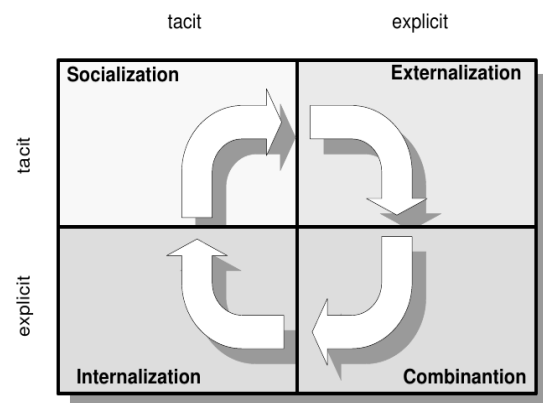- spreading process,
- systematization of knowledge.

Fig 1. Interaction between explicit knowledge and tacit knowledge.-
Source:[1].

Internalization is the last, fourth process in the knowledge management model proposed by Nonaka. It is conversion of created explicit knowledge into the organisation's tacit knowledge. This stage requires identifying knowledge important to an individual, available within the organisation.

Permanent interaction taking place on four levels of conversion of explicit knowledge and tacit knowledge results in creation of the so-called spiral of knowledge being the basis of creating and reconstructing knowledge in an organisation.

The process of knowledge management in an enterprise worked out by G. Probst consists of six parts:

- localization of knowledge,
- acquisition of knowledge,
- development of knowledge,
- sharing knowledge and spreading it,
- making use of knowledge,
- storing knowledge.

The first process is closely connected with an audit of knowledge, aimed to identify the sources of knowledge and the places of its presence in an organisation, the one located in documents and in minds of particular employees[2]. The result of such an audit is a well-prepared knowledge map

presenting the taxonomy and directions of flow of streams of knowledge in an organisation. Another method of localizing internal knowledge is address books containing data about experts working in the company and their competences.

An enterprise is able to acquire knowledge from external sources by means of cooperating with other organisations, employing new employees, purchasing licences or from internal sources, e.g. with the use of its own research.

Development of knowledge in an enterprise may take place on the level of an individual and on the level of a group. Then, a team working together every day is able to elaborate group behaviours characterised by skills that none of the group's members has. The interaction between the individual and the group is two-sided: the individual contributes to the enrichment of the group and the group stimulates an individual's development by means of a feedback. In order to include the knowledge of particular members of the group in the collective knowledge development process, communication, interaction, transparency and integration of resources of knowledge must take place. Communication and interaction determine about the possibility of confronting ideas and experiences between departments; these are the factors determining the organisation's collective intelligence.

The process of sharing and spreading knowledge is of key importance in knowledge management. Effective distribution of knowledge to persons or organisational units that need it at a given time and in a given place is also the most difficult challenge that an organisation has to face. A prerequisite is the potential user's ability to localize knowledge. Owing to its immaterial character, it is often possible to share and distribute knowledge exclusively through direct contact of two or more persons.

The last but one stage of the knowledge management system according to Probst is making use of knowledge. For this purpose an enterprise should make the knowledge available to the user. In order to do so, systems providing access to knowledge must be easy to use, quick, compatible with other systems and knowledge should be presented clearly and explicitly.

The last process is storing knowledge. The best and most effective tool for storing data is a data base allowing to quickly find required information. Despite complex systems for data storing and exploring, knowledge as immaterial goods is usually stored in the employees' minds; therefore the best method of storing knowledge is to employ a person possessing considerable knowledge.

In both knowledge management models referred to above the key factors determining the success of an enterprise are as follows:
- communication,
- localization of knowledge.

For effective communication it is essential to communicate with the recipient, which requires localizing the recipient in the event of the sender initiating the connection or identifying the sender when the communication is initiated by the recipient.

In the knowledge localization process the knowledge map is used, thanks to which it is possible to identify persons possessing required knowledge.

III. Innovativeness of .tel domains

Internet domains are one of the basics as regards development of the Internet and e-market. The domain name consists of several labels separated with dots. On the top of the hierarchical domain name system there are top level domains (TLD) which include:
- country-code TLD,
- generic TLD.

The first group refers to domain names representing particular countries, e.g. .pl - Poland, .de - Germany, .ru - Russia. These domains consist of not more than two characters.

The other group is generic LTD, e.g. .com, .net etc. The number of domains belonging to ggTLD group constantly increases with new names such as .aero, .name, .pro, or .museum. Below TLD there are secondary level domains - SLD.

What characterises .tel domains and distinguishes them from earlier extensions from TLD group is a possibility to place contact data directly in DNS system. This solution releases individuals and entities using the domain from a necessity to possess and maintain a web server with the website. Moreover, websites in .tel domains are optimised for displaying in mobile devices. Telnic Inc., the owner of this extension, is responsible for correct functioning of the system and security of data.

.tel domains are used for publishing contact data, such as phone number, fax number, website address, e-mail address, Skype user name or profile name in social network services.

Since .tel domains store contact data directly on DNS servers, server does not react to a a query about the domain like in 'classical' domains to the address of the server of e.g. website but sends contact data (Fig. 2).
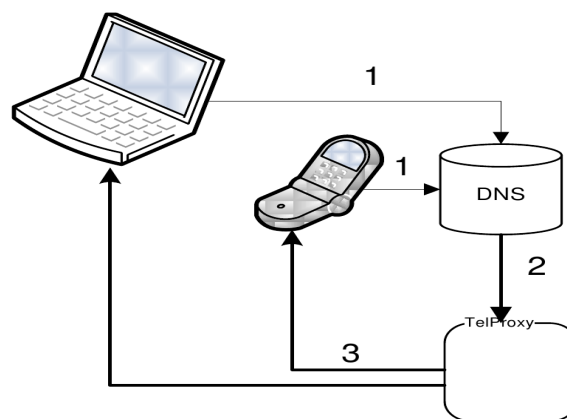

Fig 2. Gaining contact data in .tel domains source: own study

When the address, e.g. kotwica.tel is entered, the connecting device connects with DNS server administered by Telnic (1). DNS server returns information that the domain's owner decided to publish. These data are transferred to TelProxy, software processing received information to the website in case of PCs and text site in case of mobile devices. Detection of the type of device connecting with domain kotwica.tel on

the basis of user agent allows to optimise the structure of returned information and quick loading of the contents to the given device (3).

Contact data presented in a mobile phone allow for direct contact with an individual or an enterprise by means of e.g. phone number published in the form of a link, thanks to which it is not necessary to manually dial the number. Other contact data are also published in the form of links, which enables the user to connect the addressee with the use of other devices, such as Skype.

Additionally to using dns records through TLD domains, .tel domains also use NAPTR record by integrating it with TXT and LOC record. This allows to publish phone numbers as links and to create hierarchical systems. Owing to TXT record, all kinds text information, e.g. names, surnames, key words, e-mail addresses, etc. are displayed; LOC record allows to publish data with regard to geographic location. This function, based on Google maps, enables individuals and companies to precisely mark location.

IV. TELFRIENDS SYSTEMS

Basically, what is published on sites of .tel domains is contact data, allowing to quickly connect with the domain's owner. Owing to a possibility of editing data in a simple way and of updating them quickly on the website, contact data are not very sensitive to change, provided that they are regularly updated by the domain's owner.

Each user has access to information as it is predefined as public. However, the domain's owner may make sensitive personal data available exclusively to persons authorised by it, the so-called friends, with the use of TelFriends system.

TelFriends is a global, free system allowing to share and have access to private data of the domain's owner. What characterises this system is that it is common, free of charge and there is no necessity to purchase .tel domain.

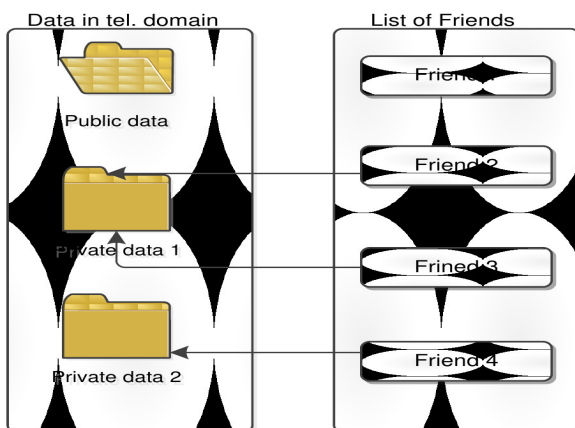The owner of .tel domain can add to its account persons that got activated in TelFriends system. Personalization of profiles of added persons allows to make defined private information available to selected 'friends' without right of access to private data intended for another group of 'friends' (Fig. 3).

Thanks to mobile use of .tel domain, simplicity of use and TelFriends system as well as the possibility of taxonomy, .tel domain is perfect for construction of expert database system served by mobile and stationary devices.

V. EXPERT DATABASE BASED ON .TEL DOMAIN

As regards the requirements of a person looking for an expert, expert database should be simple to use. The person using this tool needs to quickly find a person possessing required competences and information necessary for contacting the expert. As regards the construction of expert data base, its design should be based on taxonomy worked out at an earlier stage.

In case of expert databases based on .tel domain, an enterprise may distinguish two groups of experts' contact data. The first group includes public information to which all users visiting a corporate site .tel have access. Apart from basic information such as the company, address, telephone number, website or e-mail address, contact data of commonly available experts, e.g. persons responsible for contacts with the client, should be published.

The other group of published contact data includes an enterprise's private information made available to the company's employees already registered in TelFriends system. Moreover, by means of editing profiles of groups of 'friends' of the corporate .tel domain, the enterprise is able to make particular resources available only to selected employees, thus providing security of experts' published personal data (Fig. 4).
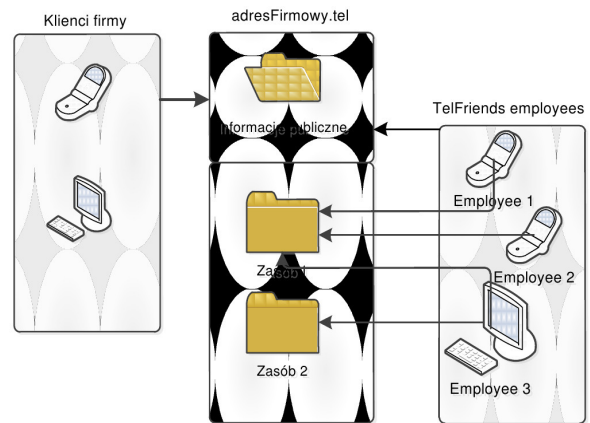

Fig 4. TelFriends system used for the purpose of information security with regard to data in an enterprise.source: own study

The above figure presents an example of information security with regard to experts. Employee 1 has no right of access to information about experts contained in File 2, although he belongs to the organisation. As regards employee 2, we deal with a similar situation. Employee 3, possessing a larger scope of powers given by the administrator, is allowed

Fig 3. Access to private resources available to 'friends' of .tel domain.- source: own study

to look through contact data of experts contained in File 1 and 2. It should be emphasised that both stationary and mobile devices may read experts' contact data.

What is more, . tel domains allow to construct transparent structures according to predefined taxonomy (fig. 5).
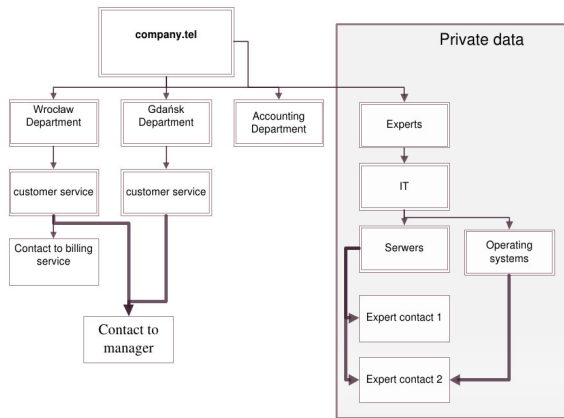

Fig 5. An example of structure of expert database based on .tel domain.source: own study

The above structure is divided into two parts:
- public
- private.

Contact data contained in the public part are made available to all users, whereas private data are available exclusively to the given enterprise's employees.

The structure of published expert database allows for quick and easy contact with the expert one is looking for. What facilitates work performed by the administrator of expert database is the possibility of assigning an expert's con-

tact data to several categories, e.g. contact to the manager of the customer service department, although entered into the system only once, is visible both in the customer service in Wrocław and in the customer service in Gdańsk.

By creating a multi-level structure of expert database, an enterprise can make data available to users of corporate .tel domain. The search engine is available from the level of a website on which contact data are published. Users of expert database are able to search for an expert either by means of a logical structure or by entering a key word. In the latter case, the search engine will search the corporate .tel domain and present conditions matching the required criterion.

VI. Conclusion

.tel domain seem to be a very good tool for construction of expert database serving both stationary and mobile devices. The base supports the combination process in I. Nonaka's model and the knowledge localization process in G. Probst's model. Additionally, TelFriends system facilitates to protect data and to provide access to data exclusively to persons authorised to it. One of the obvious advantages of .tel domains is a possibility of simple construction of structures reflecting the enterprise's or organisation's hierarchy. Another positive feature as regards .tel domains is low cost of service and no necessity to purchase or possess additional IT infrastructure.

Some of the drawbacks are the necessity to administer published information by only one person and users' little knowledge about .tel domains.

References
[1] Nycz M. (ed.),Generowanie wiedzy dla przedsiębiorstwa. Metody i techniki., Wydawnictwo AE we Wrocławiu, Wrocław 2004, p.78
[2] 2. http://www.pyton.pl/u_audytywiedzy.asp 2005-02-06
[3] 3. You Guide to .tel, https://tel.ovh.com/vfs/pdf/telguide_en.pdf, 2012-05-05
[4] 4.TelFriends Guide, http://telnic.org/downloads/telfriends_guide.pdf, 2012-05-05