



SoN-KInG: a digital eco-system for innovation in professional and business domains

Digital
eco-system
for innovation

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Abstract

Purpose – An open question in the advanced economies, and in the current crisis even more, is to widely improve knowledge sharing as a driver of innovation and creativity processes. The need of addressing knowledge, creativity and innovation is co-generating new knowledge sharing tools, attempting to create new network linkages among professionals (such as engineers, researchers, professors, architects, creative designers, etc.), among financial/business companies and, between professionals and financial/business companies. The paper aims to discuss these issues.

Design/methodology/approach – To achieve this goal, during the Knowledge Intelligence and Innovation for a sustainable Growth (KnowInG) project (2010-2013), the Social Network KnowInG (SoN-KInG) model and framework consisting in a digital eco-system were created. The benefits and the potentialities of the SoN-KInG as knowledge sharing tool both for professionals and businesses are discussed in the paper.

Findings – SoN-KInG unifies the innovative aspects provided by three different social networks (Facebook, LinkedIn and Twitter) both, in professional and business domains, giving a holistic tool for knowledge sharing and knowledge management for online communities of interest.

Originality/value – SoN-KInG provides an original model based on a holistic vision of social networking in the innovation and business domain and a framework, which consists in a web platform functioning as a hub of communities of interest where each member can converge creating new communities and also embedding communities where s/he is already involved in.

Keywords Knowledge management, Innovation, Social media, Digital business eco-system

Paper type Research paper

Introduction

The need of addressing knowledge, creativity and innovation stimulated the creation of new network linkages among professionals, financial/business companies and, between professionals and financial/business companies.

The Knowledge Intelligence and Innovation for a sustainable Growth (KnowInG) project, funded by the STC MED programme, with its activities and presence in some Mediterranean regions was devoted to enhance the cooperation of key institutional and economic actors and promote the “knowledge economy” by launching a transnational dialogue platform on policies, tools and strategies for attracting and creating “innovation”. In particular, the project aimed to encourage the creation of new knowledge (from personal to collective perspective) through the implementation and evolution of networks of actors (i.e. professionals, companies, industries, creative people, researchers, business organizations, etc. for the sharing of knowledge). These goals were accomplished starting from the awareness that innovation and creativity arise through



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the confluence of knowledge, creative thinking and motivation of involved actors. All these elements are relevant at local level in small communities, where common social beliefs and values create the necessary trust for the sharing of knowledge, information and services. However, the circulation of more ideas and the creation of more wide and interconnected communities, are needs in the global economy and are more and more evident with the wide use of internet.

In this context, knowledge sharing and participation are widely implemented thanks to the availability of ICT tools such as social networks (SNs) that organise communities in a virtual global environment.

SNs in the last years have improved the possibilities of creating patterns of self-organizing behavior that is a crucial issue for addressing participatory and knowledge sharing approaches of communities, devoted to stimulate innovation and creativity and to represent their changes and evolution.

Even if SNs are widely used in people daily life mainly as tools for interpersonal communication and collaboration, however also professionals and financial/business companies are more and more interested in their use for the sharing of experiences, ideas, knowledge and interests that are necessary for the increasing of innovation and competitiveness.

On considering the professional perspective, SNs are changing the way in which people work and collaborate. Popular SNs are more and more frequently used by professionals to bring people together to collaborate and learn from each other, creating and sharing new knowledge. In particular, professional SNs connect people that share the same topics, knowledge objectives, documents, experiences and links. According to DiMicco and Millen (2007), that studied how the IBM employees use Facebook, "SNs are tools to maintain contacts, awareness among colleagues, build relationships within the organization". In particular, the authors observed that IBM employees used Facebook to keep in touch with college friends and with those in their workplace.

With respect to the business perspective the potential of SNs is mainly given in terms of added value they provide, resulting from new combinations of information, products and services and innovative integrations of resources, roles and relationships between companies and consumers. In the business perspective, consumers are acquiring more and more an active role; they have the possibility to talk with other consumers having the same interests; they can exchange opinions and advices about products/services and they can also provide opinions and judgments about products/services to the production company. Companies can engage consumers in selling their products/services providing information about them. In this manner SNs became tools for matching products/services' supply and demand.

Starting from these considerations the paper discusses the impacts that SNs have both in professional and business domains. The discussion is extended also in creative activities, knowledge sharing and innovation. Knowledge can be shared and innovation and creativity produced considering SNs as social systems with their relationships, roles, influences of social conventions, and the culture of the connected community from local to transnational level. Therefore, SNs are considered as complex systems influenced by a multiplicity of factors evolving themselves as in a digital eco-systems (DES). In this perspective, the Social Network KnowInG (SoN-KInG) model and framework consisting in a DES have been created for the KnowInG project.

In particular, SoN-KInG provides an original model based on a holistic vision of social networking in the innovation and business domain and a framework (a web platform functioning as a Hub of communities). It implements an evolutionary and self-organizing community of communities connecting professionals and businesses belonging to three different SNS: Facebook, LinkedIn and Twitter.

SoN-KInG organizes the different communities through a network of concepts (categories and topics) belonging to ontologies that characterise each SN. Moreover, to facilitate the knowledge sharing and information retrieval by the different communities' members keywords are used. The "community of communities" is the core concept in defining the SoN-KInG, as it produces not a merely mutual enrichment given by the sum of individual knowledge.

The whole is more than the sum of the parts; Gestalt theory is based on this principle (Wertheimer, 1938). Gestalt psychologists such as Wertheimer (1945), in their distinction between the productive and reproductive thinking underline how the productive thinking needs to overcome the existing association (creating new ones), while in the reproductive thinking existing associations are sufficient. SoN-KInG, in its need to create new knowledge, starting from the existing one, adopts the concept of gestalt, and in particular the concept of productive thinking, modeled as a DES.

The paper has structured as follow. In second section a description of the different studies on SNS use both in professional and business domains is provided. Third section describes the SoN-KInG model and framework analysing the innovation aspects it provides in professional and business domains. Finally, fourth section concludes the paper.

Background

Innovation is the driving force insuring the long-term-survival of professionals and financial/business companies. SNS play a very relevant role in creating innovation (Wineman *et al.*, 2009; Helms *et al.*, 2012; Burt, 2004; Perry-Smith, 2006) and knowledge sharing is considered to be the most relevant resource of innovation (Conner and Prahalad, 1996).

SNS in professional domain ensure the sharing of ideas able to increase the production of innovation; while in business domain they mainly play relevance in creating innovative business models and strategies as they represent a different SNS use in professional domain.

The emergence of popular SNS such as LinkedIn, Facebook and Twitter are changing the dynamics of professional influence, because they are increasingly used to collaborate on professional issues and to share experiences, ideas and interests.

The TNS (2012) (www.marketingprofs.com/charts/2012/8961/professional-vs-personal-the-social-media-mindset-divide) study found that people when use SNS have different needs, interests and emotions that are different for personal use respect to professional one. According to this study in personal networks, people usually spend time for entertainment and socialization. Whereas in professional networks, people invest their time to make useful contacts and search for job opportunities.

Several studies have been carried out on professional use of Facebook although it was not born whit this purpose. Facebook is the most widely used SN and it addresses general issues, unlike LinkedIn that was created with professional purposes. However, considering that Facebook has 963,653,140 users (February 2013)

(www.checkFacebook.com/), compared to about 175,000,000 on LinkedIn (February 2013) (www.linkedin.com/ads/), it is also the place where easily find and aggregate people in a new community according to their interests. For this reason, there is a wide attention for its growing professional use. Comscore (<http://EzineArticles.com/2299744>) also indicated a gradual demographic shift from college students to professionals aged 35 years or older in the number of Facebook users. The majority of these users are using Facebook for professional and business networking (<http://EzineArticles.com/2299744>). The demographic shift was confirmed by iStrategy Labs finding that within the last six months, the 55 and older age category of Facebook users had increased by 513.7 per cent (Corbett, 2009). These data indicate that Facebook is a SN not only used by young adults, but it is becoming a space with wide appeal for interaction among many users with different characteristics.

Skeels and Grudin (2009) found that Facebook is used by Microsoft employees to build stronger working relationships and for professional information-gathering. They found that it is also used to maintain relationships with colleagues and to re-establish contacts with classmates and ex-colleagues.

Hopkins (2012) analysed the use of Facebook by small businesses as a resource for growth and adding value. It found that Facebook offers the business both direct value (based on transactions, quantified by the increase in turnover experienced through connecting with new customers) and indirect value (based on word-of-mouth and positive recommendations).

Sohn (2007) underlines that “many people have already found Facebook to be essential for their web working toolbox”. Moreover, she provides 12 ways to follow so that “Facebook can benefit the web worker, particularly those who are home-based”. Among these, the most relevant are: to look for old co-workers and current connections, add friends and apps selectively, edit news feed preferences, join groups related to business interests, ask questions, look for events, and edit profile and security settings. Therefore, Facebook is more and more used in exchanging professional information and in sharing professional knowledge.

Ferri *et al.* (2012b) analysed the use of Facebook for professional purposes and in particular for knowledge sharing among researchers. They found that Facebook is increasingly used both from researchers and professionals in all the research fields, because of its potentialities for an efficient and effective information delivering and knowledge sharing. In fact, it facilitates the organisation of events, conferences, professional courses and the creation of debates and discussions about specific topics. According to interviewed people, not only Facebook, but social media in general, in the near future will change our work, as they will be essential tools for sharing knowledge and creating new one, and they will be indispensable in every professional field. This is also in business domain, where SNs are widely used, as described in the next section.

The business potential of SNs is mainly given in terms of added value they provide, resulting from new combinations of information, products and services and innovative integrations of resources, roles and relationships between companies and consumers. Vuori (2012) explored internal and external uses of social media in a global corporation. Internally they were used for communication and knowledge transfer and to conduct internal idea crowdsourcing. Externally, they were used for communications related to the brand, to communicate with customers and to engage external stakeholders in creating a new idea via a crowdsourcing platform.

In Saarijärvi *et al.* (2013) starting from the analysis of the literature published from 2003 to 2011 on customer relationship management (CRM) frameworks a conceptual framework of the changing role of customer data in the CRM framework is provided.

Due to their potentialities of innovation, SNS are attracting significant interests and benefits for companies and consumers (Ferri *et al.*, 2012a; De Valck *et al.*, 2009; Sindhav, 2011; Arnone *et al.*, 2010; Whyatt and Koschek, 2010).

As Porter (2004) underlined, many companies already in 2004 have begun to integrate SNS into their business strategies searching different benefits such as:

- more effective market segmentation (Armstrong and Hagel, 1995);
- new product development efforts (Moon and Sproull, 2001);
- stronger brands (McWilliam, 2002);
- positive word-of-mouth (Bickart and Schindler, 2001);
- increased web site traffic (Bughin and Hagel, 2000); and
- increased sales (Brown *et al.*, 2002).

Wiertz and De Ruyter (2007) investigate contribution behavior to firm hosted commercial SNS, in which consumers interact to solve each other's service problems. Customers acquire a new role as they collaborate with companies producing a new shared knowledge. This use of SNS extends the model of social capital based on Wasko and Faraj (2005) in order to examine the direct impact of commitment both to the SNS and the host firm on quality and quantity of knowledge contribution.

Herdon *et al.* (2012) give an analysis of the e-readiness of small and medium-sized enterprises. In the paper an evaluation of new technologies to build a digital business ecosystem (DBE) for SMEs is carried out.

With the advent of social media and in particular with the widespread diffusion of SNS and virtual communities, a new generation of business and consequently new business frameworks are emerging. D'Andrea *et al.* (2011) provide a framework to analyse the marketing and promotion advantages of virtual communities. The framework has been applied to second life in order to analyse three different business strategies that companies usually implement. The first strategy allows companies to perform the placement of their products/services in a dynamic form. The second strategy provides companies with the possibility to improve their knowledge of customers' needs in order to develop products and services that better satisfy customer's expectations. Finally, the third strategy allows companies to develop high brand awareness. A marketing framework is also provided in D'Andrea *et al.* (2012b). The framework involves: actors (companies and companies); goals; marketing strategies and influence process. Each of these elements is described in detail. Moreover, in the chapter the framework is applied to e-bay in order to understand how the functionalities provided by this virtual community allow companies and consumers to achieve their marketing goals. Another marketing model is provided in D'Andrea *et al.* (2012a). The model gives the rationale of strategies and processes that companies use to provide and capture value through SNS. It includes the selection of potential SNS to be used; the definition of a financial plan; the definition of organisational structures to manage the Social Network in the market; the selection of target (consumer); the promotion of products and services and finally the performance measures with specific indicators. The framework is applied to You-Tube in order to explain how companies and consumers can use this Social Network to implement their marketing strategies.

A theoretical framework involving elements actors contributing in planning on-line viral marketing campaigns is provided in Grifoni *et al.* (2013). The framework presents four different phases of the analysis. The first phase involves the analysis of the company, its business context and the knowledge of the type of on-line viral marketing campaigns already done internal and external. In the second phase objectives and target are defined. On considering the third phase this includes the message creation and the selection of tools to use. Finally, in the last phase, the implementation of the on-line viral marketing campaign is carried out. Each of these phases is characterised by different actors involved in the different processes.

A particular relevance is also given by the DES that give important benefits to the business strategies. In D'Andrea *et al.* (2013) a framework for digital business eco-systems consisting of three different steps: digital business eco-system creation, monitoring and evaluation are provided. In the creation phase, the analysis of available financial resources has to be carried out, the value creation and sharing among the actors of the DBE has to be stimulated and strategic decisions have to be chosen. After the creation it is important the monitoring activity in order to manage the healthiness of the digital business eco-system. For the monitoring phase, some parameters are important to consider such as: quantifiable parameters, competitive assets and current roles and strategies. Finally, the impacts of the digital business eco-system have to be measured in term of productivity, robustness and niche creation.

Starting from these studies the paper has defined the SoN-KInG model and framework consisting in a DES. In the following section it is described in detail.

SoN-KInG: the model and the framework

Creativity and innovation involve professional and business activities of people and companies. Some professionals and businesses have strongly pointed on knowledge-sharing by social networking. SNs allow professionals to create continuous ongoing dialogue, modeling their social knowledge at individual and group level. Moreover, the interest of companies is also emerging in using SNs for sharing knowledge and services with the aim of promoting innovation and knowledge sharing on specific sectors (for example fashion) or services (such as finding funds or developing a marketing strategies). In Figure 1 the knowledge sharing process as an innovative issue provided by SNs both on professional and business domains is illustrated.

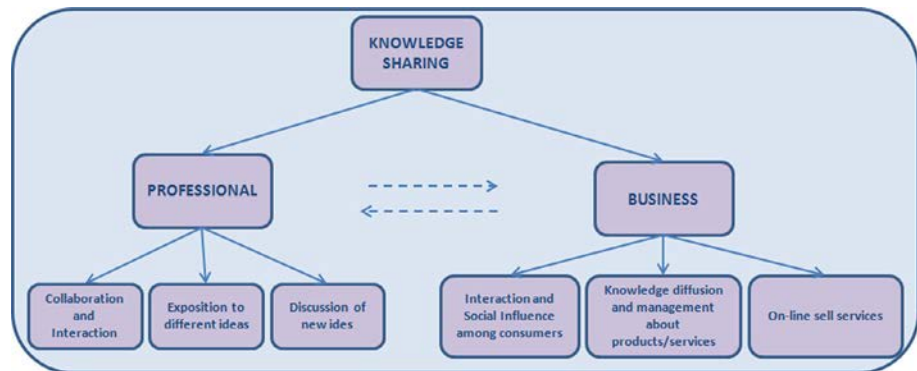


Figure 1.
Innovation aspects of SNs
in professionals and
business domains

SNs make professionals smarter because they simplify interactions/collaborations, also in reason of the less formal roles of their members respect to the real professional communities and their convenience in terms of costs.

Moreover, SNs expose professionals to divergent ideas both within and outside the organization (Burt, 2004), allowing them to make connections among seemingly disparate ideas. New ideas are also refined, evaluated, and improved through discussion with others.

This exchange of ideas contributes to increase knowledge sharing.

As regard to the business processes, the innovative impacts of SNs are connected to their ability to generate:

- (1) interaction and social influence among consumers;
- (2) knowledge diffusion and management about products/services; and
- (3) on-line sell services.

Point 1 indicates the aptitude of SNs to generate interaction among consumers. Many companies have recently started to capture data on the social interaction between consumers in SNs, with the objective of understanding and leveraging how this interaction can generate social influence. Social influence is the process by which the individual opinions can be changed by other individual(s) (Friedkin, 1998). Consumers can really modify their opinions about products and/or services according to the social influence process. In fact, in the social influence process a consumer “A” has her/his initial opinion about products and/or services. This opinion evolves as a result of interaction with other consumers that, in turn, evolve their opinion as a result of interaction with the complex network of social influences.

SNs also emerge as one of the most authoritative and influential source of knowledge about products/services (point 2 of the innovative impacts of SNs) related to the area of interest of a community. They have the aptitude to generate knowledge sharing among consumers, and facilitate the collaboration and exchange of ideas among consumers.

With respect to the point 3 of the innovative impacts of SNs customers associations and a large part of businesses platform for selling, such as Amazon, and other similar, have SNs resources that allow customers to express their opinions on products, producing social influence, but also knowledge on products.

Starting from these considerations, the experience carried out in the KnowInG project consisted in:

- observing some features of SNs used for professionals and business; and
- developing the SoN-KInG model and framework, i.e. the “community of communities” (SN of SNs) for enhancing the productive thinking of people and companies.

SoN-KInG has been conceived on the base of the gestalt principle of consistency of the different communities that contribute in the different SNs of business and professionals.

The Merriam-Webster dictionary defines consistency as the “agreement or harmony of parts or features to one another or a whole”. This concept has been modeled as a DES.

The DES concept emerged worldwide as an approach to support the development of innovation in the global economy (D’Andrea *et al.*, 2009). A DES is defined in Chang and

West (2006) as “an open, loosely coupled, domain clustered, demand-driven, self-organising agents’ environment, where each species (actor) is proactive and responsive for its own benefit or profit”. The concept of DES acquires a particular relevance within organizations and professional environments because it allows to dynamically join the innovative aspects of both professional and business domains by enhancing knowledge sharing among professionals and developing new ideas for creating innovative business models.

Within a DES, professionals and companies are able to cooperate dynamically and develop complex innovative business models, creating knowledge sharing and producing new ideas and services/products innovation. SoN-KInG model and framework have been built according to this perspective, allowing professionals and companies to build communities that share business, knowledge, and services.

Figures 2-4 show the main issues of the SoN-KInG model.

Two different levels compose the SoN-KInG model. The first is the user level that allows each user to join herself/himself to the SoN-KInG enabling them to do three different kinds of activities:

- (1) search;
- (2) add; and
- (3) browse.

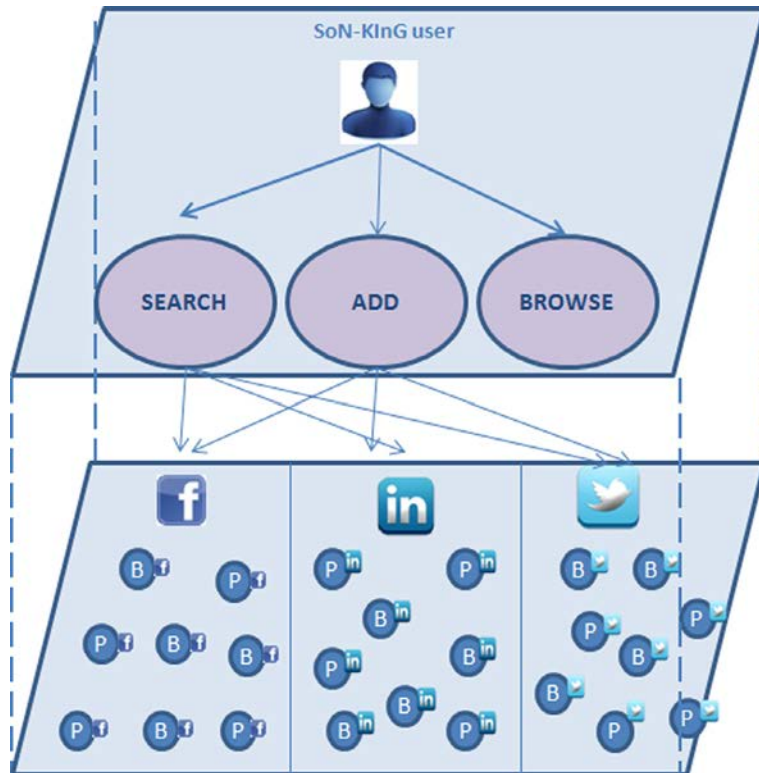


Figure 2.
The SoN-KInG model:
user level

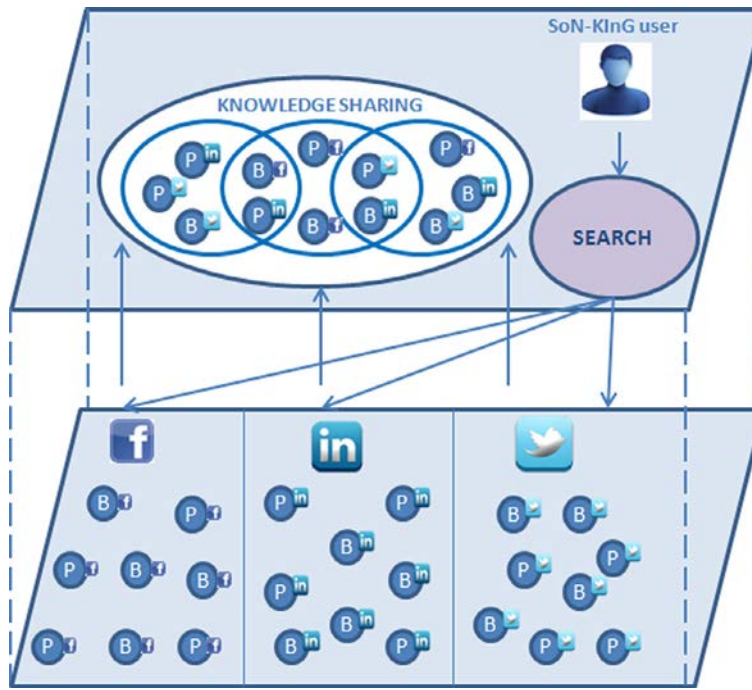


Figure 3.
The SoN-KInG model:
“search”

The “search” activity (Figure 3) allows users to:

- find, on the basis of specified key-words, all information; and
- interact/collaborate with professionals (indicated in the figure with the letter P) and businesses (indicated with the letter B) of one or more SNs (Facebook, LinkedIn and Twitter).

This interaction allows the user to model its knowledge at individual and group level.

While the “add” activity allows users to insert into SoN-KInG (from the three SNs considered), some pages, profiles that they consider important for other users join in the SoN-KInG. Also in this case the user has the possibility to interact/collaborate with professionals and businesses one or more SNs by enhancing the knowledge sharing.

Finally, the “browse” activity allows users to search information already stored in SoN-KInG by other users, classified for topic of interest.

The SoN-KInG model has been implemented in the SoN-KInG framework. It has been developed by the Institute for Research on Population and Social Policies of the National Research Council of Italy (IRPPS) within the knowing project (empowering the PLAKSS platform, i.e. the platform of knowledge and services sharing) with the aim to create a tool unifying Facebook, LinkedIn and Twitter by topic of interest, for sharing professional and business resources and building a new ecosystem on innovation.

The users of SoN-KInG framework can be friends of the community, sharing and organizing resources. Moreover, the SoN-KInG framework is a hub of SNs that evolves in terms of users and interests. After six months from the beginning of the use

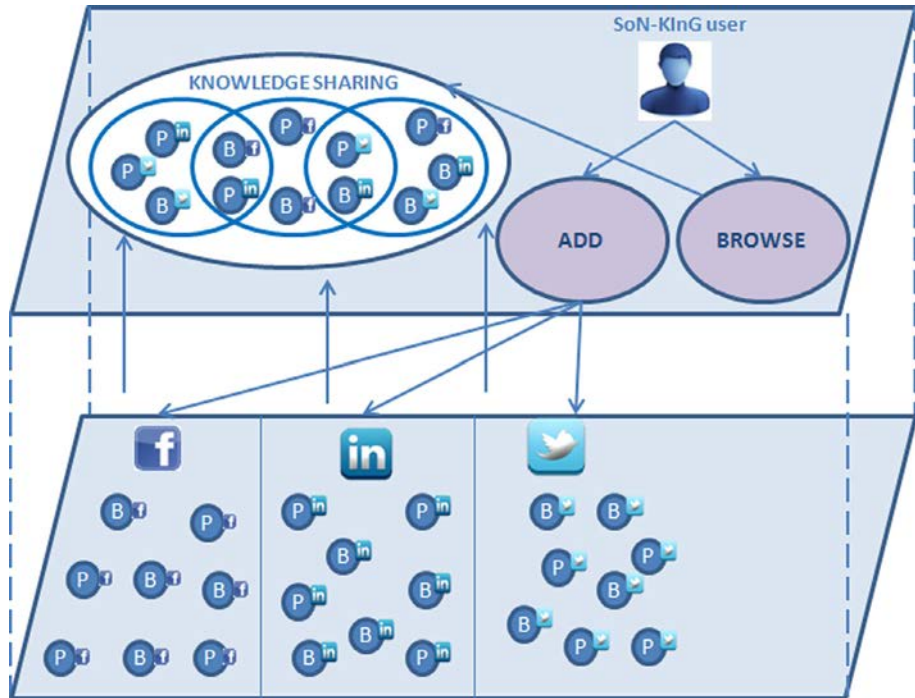


Figure 4.
The SoN-KInG model:
“add” and “browse”

of SoN-KInG framework 46 users have added, 403 Facebook pages, 327 Twitter profiles, 226 companies on LinkedIn, and 137 members on LinkedIn. 39 users have built an ecosystem for professional purposes, while the remaining seven are part of an ecosystem business issue.

Consider the case of Rita, a young woman just out of the school of fashion designers that wants to open a design and fashion studio in collaboration with some classmates.

Rita wants to give international visibility and to find customers for her initiative. Rita was able to search through professional services available on Facebook, LinkedIn and Twitter by SoN-KInG framework; she found some SNs resources such as for example the Facebook page fashion knowledge (www.facebook.com/FashionKnowledge) where each designer can see the ideas of others and s/he can propose her/his own (knowledge sharing) in order to compare and measure the flow of different ideas. Rita has also found some useful pages and links to marketing services for developing an appropriate business plan. As regards the business side, Rita found information needed to organize the on-line advertising of products and on-line sales channels involving different SNs to reach all potential customers.

An example of the web platform, which implements the SoN-KInG knowledge sharing on the existing SNs such as Facebook and LinkedIn is given in Figures 5 and 6. In particular, Figure 5 shows the Hellenic Game Jame Facebook page as result of browsing for information on “video game development”, and Figure 6 shows some results from LinkedIn, when browsing for “games”.

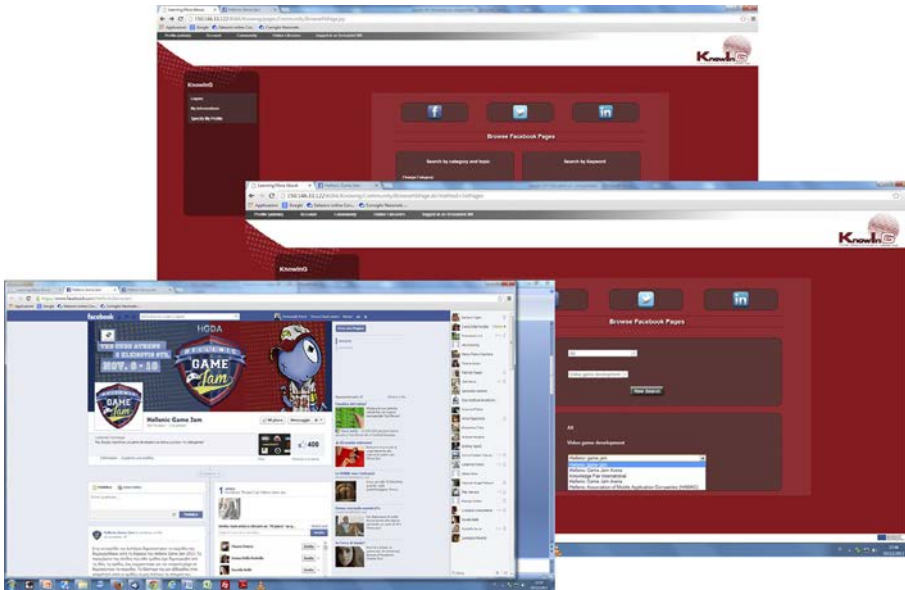


Figure 5.
Browsing for information
on “video game
development” in
SoN-KINg web platform

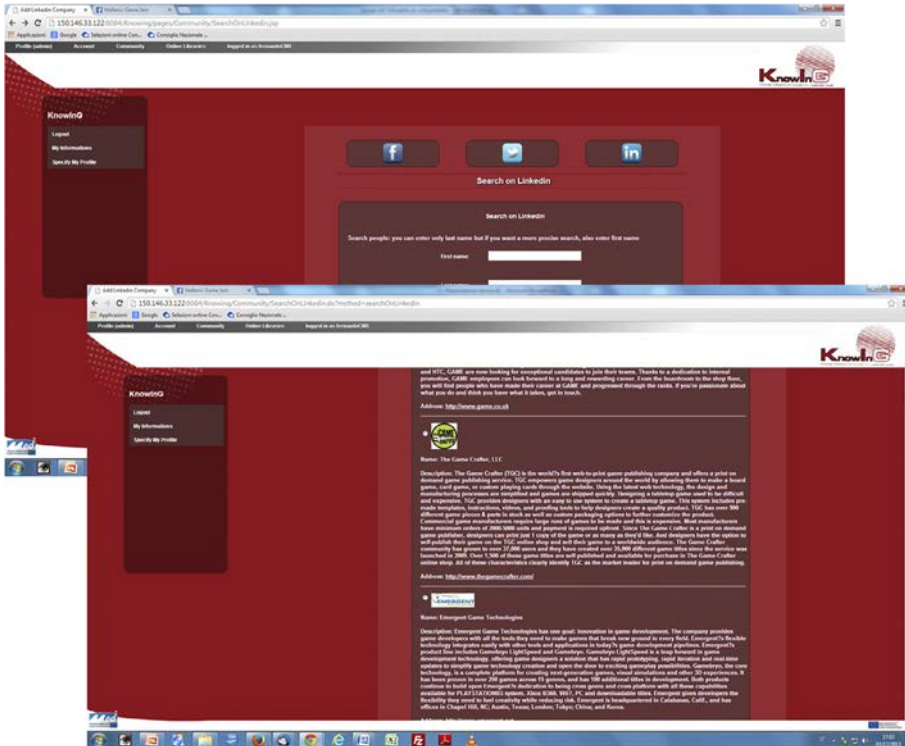


Figure 6.
Browsing for information
on “games” in SoN-KINg
web platform

Six months after the beginning of the use of SoN-KInG web platform some interviews have been carried out to selected users that used it, for evaluating user's satisfaction and platform effectiveness as well as its usability and utility.

The test involved ten people including researchers and businesses, which were proportionally distributed between males and females, and with ages from 30 to 60. They have been asked to comment and discuss the strengths and weaknesses of the web platform.

The SoN-KInG web platform has been evaluated according to two different parameters:

- (1) usability; and
- (2) accessibility

The usability parameter takes under consideration as relevance measurement the effectiveness of operation, based on the success of the first use. The accessibility aimed to make the SoN-KInG web platform more widely usable by low-vision users. Accessibility parameters evaluated how users interact with the SoN-KInG web platform, where they are successful and where they encounter difficulties using it.

Interviewed users given a qualitative evaluation also about the model of the platform. In particular, six users express their preference in using of a model (like SoN-KInG) that has an holistic approach for knowledge sharing and management in respect to existing models that use a classical approach. According to the results of the survey, the weakness encountered by users mainly consists in the fact that SoN-KInG web platform needs to be populated with a greater amount of shared resources. However, a "community of communities" has the advantage of the potentiality of sharing a filtered collection of elements present on different SNs.

The interviews highlighted the effectiveness of the SoN-KInG web platform expressing a high level of user's satisfaction in using it both in terms of usability and accessibility. Moreover, users suggested evolving (improving) the platform providing [...]. All suggestions provided by users during the evaluation process will be taken into account in order to evolve and improve the web platform.

Conclusion

The paper provides the SoN-KInG model and framework consisting in a digital ecosystem created during the KnowInG project in order to provide a tool unifying communities of interest on innovation and creativity.

In particular, the paper first provided a description of SNs use in professional and business domains then analysed the innovations aspects provided by SNs in these two different domains. The analysis shown that SNs play an important role in engendering innovation within the professional domain because people are smarter; people can have more specific interaction and collaboration in order to mobilize and build knowledge quickly. Moreover, SNs exposure professionals to divergent ideas both within and outside the organization allowing them to make connections among seemingly disparate ideas. Another way is through discussion of new ideas with others in the SNs that can be stimulating and thought-provoking. New ideas are also refined, evaluated, and improved through discussion with others. With respect to the business domain SNs play relevance in creating innovative business models as they represent a different way to engage the final consumer within the business models for products/services innovation. In fact the first

innovative element is the aptitude of SNs to generate Interaction and social influence among consumers. Moreover, SNs also emerge as one of the most authoritative and influential source of knowledge about products/services related to the area of interest of a community. They have the aptitude to generate knowledge sharing among consumers, and facilitate the collaboration and exchange of ideas among them by preserving explicit as well as implicit (or tacit) knowledge created by the consumers' relations.

Starting from these considerations the paper stated that a set of SNs defined as a DES will be able to dynamically join the innovative aspects of both professional and business domains by enhancing knowledge sharing among professionals and businesses. According to this assumption the SoN-KInG model and framework are described underling how it is able to improve innovation by enhancing the knowledge sharing between professional and businesses.

The interviews carried out to some users of SoN-KInG web platform highlighted a high level of user's satisfaction in using it both in terms of usability and accessibility. Other interviews will be carried out after two years for the beginning of the SoN-KInG use, to analyse both data and advantages/weakness arising from users.

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