

## A Virtual Community of Practice Proposal for Business Intelligence Researchers

Diana TÂRNĂVEANU

West University of Timișoara, Faculty of Economics and Business Administration,  
Timișoara, Romania  
diana.tarnaveanu@feaa.uvt.ro

*In an economical post-crisis context, the general tendency is to migrate to stronger alliances that offer support. One solution is a virtual community of practice (VCoPs) that offers an important knowledge management tool, as it is based on common goals and shared interests on a large period of time, it is capable to develop the social capital, create new knowledge, exploit the existing tacit knowledge, stimulate innovation and disseminate the results. An organization can remain an important competitor in a changing market only optimizing performance, constantly taking advantage of the raise opportunities, risking and being flexible at new multiple demands.*

**Keywords:** *Virtual Communities, Communities of Practice, Business Intelligence, Competency, Collaboration*

### 1 Introduction

Each company has to struggle with a lot of challenges: profitability, high rate of technological innovation, economic globalization, the demand for quality services and products, desire to consolidate the position on the market and many others. The need of a support is stringent; a team based on competence specialists could be the answer. But because of so many restrictions caused by time and place, a virtual meeting place for people who have the same problems and interests could be a solution. The real world was transformed into a virtual one; the activities into distributed and cooperative ones. Cooperation requires communication and coordination; developing a new paradigm of collaborative activities [1]. Virtual organization is a collaborative system in which component organizational entities have more capabilities and power than each taken individually. A virtual organization is built on four elements: connectivity, purpose, technology and separation [2]. In these environments, portal based IT platforms will integrate multi-agent collaborative systems, collaborative tools, different enterprise applications and other useful information systems [3].

Multidimensional analysis offers real advantages for the decisional factor, representing an intuitive approach of forecasting in the

present context of market economy. At the global level, the market of Business Intelligence has an upward trend. International Data Corporation (IDC), at the second part of last year, estimate that between 2009 and 2013 this tendency will continue, the average growth being 7.2% per year, slightly diminished because of the crisis, compared to 2008 and 2007 [4]. For the next period, Gartner's previsions are alike with the IDC's one. For 2009-2013 period, the growth remains but is reduced by 8,1%. The market of BI platforms is one with the biggest and quickest development, in spite of the crisis. Business Intelligence has been the no.1 technology spends for the last three years running, according to research firm Gartner [4]. Business Intelligence (BI) represents the capability to look inside a business and the environment in which it operates, in order to fundament the most productive and profitable decisions. An operational BI system sustains daily activities through the following functionalities: real-time informing, secured access to information and easy to use analysis. It can provide great opportunities if used properly.

In the European Union, between 2016 and 2010, large amounts of money have been allocated in order to support information technology. Investments done by Romania in information technology do not exceed a total

amount of 325 euro per capita in the last 5 years. According to the statistics of European Commission, the percent of people using computers in daily activities reported to the total population of Romania increased from 33% in 2006 to 48% in 2011. Among the total population of Romania, people using computers most frequently in daily activities are aged 16 to 24 (pupils, students, people enrolled in the learning system, fresh employees), sustaining activities of research and documentation that imply the use of computers [5]. This enables us to hope that our initiative will be well received, especially by the social categories enumerated earlier.

We propose a model of business intelligence virtual competency community of practice for our University, capable of sustaining practitioners share resources – experiences, problems and solutions, tools and methodologies. Such a community facilitates the improvement of each participant's knowledge and contributes to the development of knowledge within business intelligence domain and conducting original research with the help of participants. We believe creating a virtual space of communication, correctly built and managed, will be of great help to teachers, students and individuals interested in BI tools. This initiative is a part of the bigger trend of seizing the favorable mechanisms provided by the knowledge-based society, assuming a pragmatic and entrepreneurial approach in conducting the university's academic functions that will enable to capitalize its knowledge [6].

## 2 Virtual Competency Communities of Practice

### 2.1 Communities of Practice

A community is a shared interest or put in the same context group of people that contribute to solving a problem.

Community of Practice (CoP) is a concept first introduced in 1991 by Jean Lave and Etienne Wenger from Institute for Research on Learning. They described the community of practice as being a set of relationships between persons, activities and world, and relationships with other organizations based on

common interests. In 1998, Wenger extended this concept, applying it to other contexts, including organizational context.

The learning model inside a CoP is an apprenticeship model, but it is not restricted to this type of learning [7]. The process by which a newcomer learns from the rest of the group was central to their notion of CoP, so they termed this process LPP – Legitimate Peripheral Participation [8].

It is obvious that inside every collaborative environment, starting with small workgroups or practice communities (of interests, scope, action, etc.) and ending with the collaborative environment, there is a strong fundament based on knowledge and a powerful interdependence between collaboration and knowledge management. Collaborative communities represent organizational manifestation forms that wish to remain competitive in the competitive environment [9]. Value creation process emphasizes the need to integrate personal and organizational intelligence into the collective management process, generate learning mechanisms, interconnect people to dialogue and learn together, and design knowledge transfer mechanisms among the members of the community [10].

One of the barriers in implementing a CoP is related to sharing, especially between institutions, and regards legal issues as data protection, intellectual property, copyright and confidentiality [11].

From the causes that can make a CoP fail we enumerate the lack of a common, shared identity, the lack of consensual knowledge, the uncertainty factor (based on volunteers, sometimes a problem can remain unsolved or untouched), geographical distance (differences in time zones), cultural factors (if working with worldwide members) and loose opportunity for collaboration and sharing informal knowledge. Mutual involvement in common activities is a gluing factor that can help create a social entity. A CoP is visualized as a goal-seeking system whose survival is problematic [12]. CoP member's practice productions is materialized in written archives, proceedings, experiences, documents,

policies, rituals, specific idioms, blogs, wikis, forums and chats. A CoP is a vehicle for more effective virtual team working.

## 2.2 Virtual Communities of Practice

The term virtual can be defined in many ways, all of them emphasizing on having the essence or effect but not the appearance or form of.

A virtual organization is a productive and competitive group of people, with a unique identity, with loyalty and cooperation between partners. The distinguishing features of a virtual organization as opposed to a classic one are [2]:

- semi-permanent structural units, geographically dispersed;
- performance level based on a common understanding of the business;
- continuous adaptation of organizational forms;
- intensive use of information technologies.

A virtual community of practice is a network of individuals who share a domain of interest about which they communicate online [13].

Experiences are exchanged within the community. Members use community knowledge to solve their own problems and share the solution with the community. Therefore, the more the community helps its members, the more its knowledge grows, and the more it becomes attractive to new members. Key to the concept of VCoPs is the management of knowledge acquired or developed by the community, which must be indexed and stored as to be easily retrieved [14]. The domain of the community is shared interest, so, in order to achieve their goals, each member is expected to have a minimum degree of domain knowledge.

Many barriers caused by the “virtual” term can appear, one of the most important being trust. Because of weak motivation or lack of self-esteem (people having information considered not sufficient worthy or weighty), individuals may prefer to stand by, unengaging into discussions, preferring to working autonomous or not at all, read only participants being a real threat for the community [11].

VCoPs are organized using e-mails, chats, forums, wikis and website technologies for communication, and offer an environment where relevant information can be exchanged (such as experiences, history, tools, etc) and share solutions for the most frequent problems they encounter [14].

Sustaining a VCoP is difficult, but can be done through monitoring, regulating, maintaining boundaries and responding to change. VCoPs provide a lot of benefits and create opportunities that are not found in traditional organizations. They help develop a holistic understanding, increased levels of flexibility and responsiveness.

The main activities that must be fulfilled in order to obtain success in the creation of a virtual community are [14]:

- **Memberships Development:** the need to promote the growth of the community and replace the members that leave;
- **Content Management:** is related to information content, alliances and infrastructure. Content management must create the members' profile, divide them in sub-communities according to specific topics, capture, disseminate knowledge and create processes that facilitate members involvement;
- **Relationships Management:** must be developed based on explicit general rules that help members solve conflicts that often arise, on their own or with the help of moderators.

## 2.3 Virtual Competency Communities of Practice (VCCoPs)

Competence identification and its management may help in innovation, decision support, faster process and product quality improvement, and constitute an important input to the creation of the company's organizational knowledge [15].

We found different definitions for competency, all of them suggesting it is an individual personal ability expressed on a set of skills that can help an organization get a competitive advantage. We are interested in competency because we want to: identify strengths and weaknesses in the organization, reduce

vulnerabilities represented by people leaving the organization and taking key competencies away, match the most adequate employers to execute activities in a project, stimulate interactions and exchange of knowledge in the organization, leading to innovation.

Most VCCoPs offer resources that facilitate and promote social interaction and information sharing. The use of social software and knowledge management technology support Socialization, Externalization, Combination and Internalization. Social software commonly used include: e-mail, instant messaging, chats, forums, blogs, wikis, video conferencing, virtual worlds, etc and the possibility to upload data and media [14].

### 3 Business Intelligence

An organization can survive and remain an important competitor in a changing market, constantly taking advantage of the raise opportunity, risking and being flexible at new multiple demands only optimizing performance [4].

Business Intelligence can be defined as a set of mathematical models and analysis methodologies which exploit available data in order to generate useful and complex information capable of supporting the decision making process.

The tendency of any enterprise in our modern economy is to become an intelligent one and through new and innovative strategies of business intelligence (BI) obtain a competitive advantage on the market. At the same time, the collaborative environment involves the need for modern solutions to cope with the complex interactions between participants and the frequently changing market [16].

Subordinated to performance management, BI approaches help firms to optimize business performance [17].

Balanced Scorecard is a management system that maps an organization's strategic objectives into performance metrics in four perspectives: financial, internal processes, customers, and learning and growth. It is a management system and strategic planning tool, offering a global image of an organization,

transforming its strategy and mission into tangible and measurable objectives. These perspectives provide relevant feedback as to how well the strategic plan is executing so that adjustments can be made as necessary.

The Balanced Scorecard translates Mission and Vision Statements into a comprehensive set of objectives and performance measures that can be quantified and appraised. These measures typically include the following categories of performance [18]:

- **Financial performance** (revenues, earnings, return on capital, cash flow) – encourages the identification of a few relevant high-level financial measures;
- **Customer value performance** (market share, customer satisfaction measures, customer loyalty);
- **Internal business process performance** (productivity rates, quality measures, timeliness);
- **Innovation performance** (percent of revenue from new products, employee suggestions, rate of improvement index);
- **Employee performance** (morale, knowledge, turnover, use of best demonstrated practices).

The Balanced Scorecard is ultimately about choosing measures and targets. Benefit will be realized when the company manages to optimize the business processes that affect the key performance indicators (KPI) metrics. Linking Balanced Scorecard measures to strategy is vital; strategic measures, those that define the strategy designed for competitive excellence, will ground the collaborative decision processes among senior and mid-level managers. Any Balanced Scorecard Management Program can be developed based on a business intelligence approach [19].

### 4 Our Proposal – a BI Virtual Competency Community of Practice

We propose a model of business intelligence virtual competency community of practice for our University, capable of sustaining practitioners share resources – experiences, problems and solutions, tools, methodologies. Such a community facilitates the im-

provement of the knowledge of each participant and contributes to the development of knowledge within business intelligence domain and conducting original research with the help of participants.

Our approach was based on studying strategies, capabilities, processes, knowledge and organizational overview. The model proposed is a virtual organization with medium complexity level, characterized by the appearance of heterogeneous components and interactions between them. In order to implement our proposal, the following conditions must be achieved [2]:

- infrastructure that allows interactions in informatics plan;
- powerful database describing resources;
- very good virtual management.

Developing our proposal, we took into account goal, structure, flows, inputs, outputs and specific activities.

#### 4.1 Our Objectives

After some authors, a standardized BI without implementing a BI Competency Community that embodies the best practices of the organization is destined to be a short-term solution that ends with higher costs, frustration for users and decreased trust.

We consider it is important to form a community to develop business intelligence tools and solutions as a core business activity, our goals being to expose users to business intelligence by pursuing BI initiatives, discover the success and benefits of these projects in order to increase business intelligence awareness, stimulate curiosity and demand for BI, increase collaboration and strengthen the relationships between our University and teachers, students, alumni, employees or employers, researchers, specialists or just individuals interested in business intelligence.

Our focus is to create a tight network of people who are actively involved in BI, and with their help to create a business intelligence virtual competency community of practice. Our community be developed building a portal that enables BI users to actively share their expertise, improve both individuals and University's body of knowledge and acting

as an advocate for business intelligence user needs. This proposal was built after the Michigan's University proposal [20].

#### 4.2 Organizational Structure

In order to achieve our goals, the targeted participants have been divided into multiple roles, depending on their time commitment and their competency level.

When identifying an individual's competencies, we are taking into consideration the following: declared competences (the competences that the person thinks he/she has), project competencies (based on the projects he/she was working on, we assume that if a person worked in a project and executed an activity which require some competence to be executed, then, this person has that competence), community competences (collected from the communities in which the researcher participates or contributes) [15]. Establishing a central resource of business intelligence experts is most important.

The first layer is the one of "BI consultants", a group of 10-15 persons. They should be business experts capable of committing to create awareness, coordinate the activities of other members, train members, work with BI website design and tool reviews, working around 4-8 hours per month.

The second layer group of members will be "BI advisors", a group of 25-30 people, specialists and active members. They will meet two times per months in order to organize a project update meeting, analysis sharing and guest speakers. They are expected to actively share what they do in areas of BI, but they are not expected to driving awareness and coordinate activities.

The members from these two layers should be the owners of issues that either have been solved already with business intelligence or need to be solved using BI, passionate about BI, with a strong desire to see it applied across the organization. They have to be credible, with strong collaboration and communication skills, versatile, with the ability to find opportunities and the ability to uncover, evaluate and analyze the impact of disruptive forces.

The third layer group will allow a simple member to participate in activities through BI email groups, blogs and BI Web site. They will keep themselves up-to-date with business intelligence activities inside the community, share ideas, submit project proposals, but would not participate in regular meetings. They are used as a pool to solicit volunteers for specific future initiatives or events. We think the members of this layer could be around 150.

The community will have to be dynamic and organic. There is always an opportunity for a member to step upward on the pyramid and ascend to a higher level.

In order to motivate people to volunteer for these layers, the community should provide priority training for their members, provide support/service to participants in helping them document and transfer knowledge to others, facilities to get familiar with methodologies and processes and highlight the professional networking opportunities.

### 4.3 Activities

As initial activities, the first layer should create the following groups in order to refine and develop the strategies and methods for creating a successful community [20]: user awareness and training group, methodology, standards and definition group, data warehouse completeness and share experiences and plans.

**User awareness and training group** will propose problems needed to be answered such as the importance of BI, the advantages the BI approach has, etc; provide technical guidance, promote discoveries and innovations in BI. They should identify the problems than can or need to be solved and advise on training plans.

**Methodology, standards and definition group** would be responsible for the inventory, building a set of methodologies, definitions and processes, capture lessons learned and integrate them into the organizational memory and identify recommend dashboards that provide more targeted information for the organizational level decision support.

**Data warehouse completeness group** would be responsible for making sure the right data is available and users are familiar with it: identifying what data is available for decision making, advocate when there is missing data and assessing solutions and work to develop clear expectations and processes for collecting data needed for decision support that is not currently available or accessible.

**Share experiences and plans** - representatives share their plans and current experiences meeting management needs for business intelligence, including the specific management strategy, use of tools and data.

From the activities that promote our community, we thought about promoting scholarships offered by different organizations, trainings, recommended readings and sites. We wanted to involve organizations that implemented BI solutions, invited them to describe their activity and experience, the possibility to visit those organizations, organizing meetings with important figures from BI domain, with motivational speakers and speeches, opportunities for job displaying or hunting, social activities such like Shadowing Day, and contests with prizes.

On the portal-based IT platform, collaborative systems meant to support socialization and sharing of knowledge, collaborative systems based on software agents and various enterprise applications will be integrated in order to support the previous activities [3].

Each activity performed by the community can be summarized by the following phases [21]:

- **analytic phase**: continuously monitoring the environment from the resources and competencies point of view;
- **planning phase**: after defining the target, the following activities should be managed: plan activities, identifying the necessary resources/capabilities, select the members from the community that are able to form a team and reach the target, establish the contributions of each actor and the cooperation rules;
- **operating phase**: controlling the quality of the products/services provided and the solution effectiveness.

Risk management represents the way of following a methodology well documented for identifying, measuring, acting and monitoring the risk in a virtual organization system.

According to [2], when dealing with risk management the following approach is proposed:

- risk's identification step – detecting the risk at the key levels of the virtual organization systems;
- measuring the effects – achieving a classification and a ranking regarding the effects generated by identified risks;
- counters' identification step - removing the risks determined by the previous step, or diminishing the impact of those risks;
- monitoring the evolution after treating the identified risks – control implementation with the goal of tracking the potentially damaging risks and calling for the appropriate measures.

Correctly identifying the risks in a virtual organization leads to a more rigorous and efficient implementation, minimizing malfunctions of the system and the information loose. We believe that by observing the following indicators we can estimate the implementation level of success: the numbers of users applying to and taking training; surveys on seminars and website users on value of the information/training provided, web site activity [4] (unique visitors, most visited pages, page views) and number of requests for additional information/strategy for developing departmental BI initiative.

A successful business intelligence initiative is an iterative and flexible process that begins with the organizational objectives and the needs of the members, and then incorporates the technology that best serves those needs. Many of the results of a successful implementation will be intangible or difficult to quantify. The community should become an enduring and continually adapting part of the University.

## 5 Conclusions

Modern organizations worldwide are slowly discovering that controlling knowledge is a major component for strategic growth and

creating a competitive organization. Being strategically important to their business, Knowledge Management contributes to the organizations in the following manners [23]:

- bring synergies among different teams;
- accelerate innovation and boosting revenues;
- improve quality in operational and functional processes;
- reduce costs and exposure to business risks.

Their goal being competitiveness, they have tools like business intelligence to help them, through key performance indicators, like Balanced Scorecards. BI has a tremendous impact on business once installed. It produces the right information at the right time, which is key element for the success of any business enterprise [19].

Virtual teams represent an organizational form that is changing the workplace and providing organizations with higher levels of flexibility and responsiveness [20]. Information technology is providing the infrastructure necessary for the development of new organizational forms.

Collaboration represents a strategic alternative to the classic approach of business development and competition. It involves managing business relationships between people, within or without groups, and within and between organizations [9].

This paper proposes a model of BI virtual competency community of practice for The West University of Timisoara, capable of sustaining practitioners share resources – experiences, problems and solutions, tools and methodologies. This will facilitate improvement of each participant's knowledge and will contribute to the development of knowledge within business intelligence domain and conducting original research with the help of participants. We recognize the enormous potential for the development of a BI virtual competency community of practice through e-mail discussion lists and discussion boards, and the challenges rise by this proposal.

The task of knowledge conversion has been left on the hands of the community members;

the environment is not capable of participating in this process. This goal could be achieved by introducing the concept of Semantic Web. It proposes the existence of collections of structured data and inference rules that will lead to automatic reasoning [14]. We consider this as a future research.

Steps have been made from learning through knowledge verification to active construction of knowledge in order to develop reflections and stimulate innovation. The evolution of the information society led to the emergence of the society based on knowledge, an intermediate step in our way to creating a consciousness society [22].

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**Diana TÂRNĂVEANU** has graduated the Faculty of Mathematics from the West University of Timișoara in 1995. She holds a PhD diploma in Management from 2008. Currently she is lecturer of Economic Informatics within the Department of Business Information Systems at Faculty of Economics and Business Administration from the West University of Timișoara. She is teaching advances in database management systems, business intelligence and decision support systems. She is the author of more than 10 books and

over 35 journal articles in the field of Knowledge Management, Decision Support Systems, Collaborative Systems and Business Intelligence.