DEVELOPING A KNOWLEDGE TAXONOMY FOR BUSINESS DEVELOPMENT IN CONSTRUCTION COMPANIES: A CASE OF TURKISH CONSTRUCTION INDUSTRY

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT

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The term business as an economical activity brings along many issues related to; managerial activities, competition, marketing, finance, risk, etc. which all of them include a high level of decision making that need to be supported by trustable knowledge. Due to the unique specifications of the construction industry and the high sensitivity regarding the decisions made accompanied with the business, knowledge and knowledge management have been considered essential for the industry. As a fundamental step of a well structured knowledge management system, classification of the knowledge plays an important role in organizing and representing a domain. Among the many aspects of decision making, decisions regarding the business development of a company play a crucial role in the survival and growth of an available business. However up to now, the literature has a shortage on a comprehensive work which attempts to classify the knowledge in this specific domain of the construction industry. In an effort to cover this gap in the literature, this study focuses on developing a knowledge taxonomy for business development management in a construction company based on semi-structured interviews with Turkish construction professionals. The taxonomy designed by referring to expert opinion is comprised of five major concepts: Business environment, Clients, Partners, Related parties, and own Company. The presented taxonomy is tested on real cases and believed to be used for representing, storing, sharing, retrieving and in general, managing knowledge related to business development management of a construction organizations for decision

supporting purposes. More over in order to demonstrate how the presented taxonomy can be used in a company a knowledge management tool has been designed.

Keywords: Construction sector, Business Development, Knowledge Management, Taxonomy, Turkish construction

ÖZ

İNŞAAT ŞİRKETLERİNİN İŞ GELİŞTİRME SÜREÇLERİNE YÖNELİK BİR BİLGİ TAKSONOMİSİ GELİŞTİRİLMESİ: TÜRK İNŞAAT SEKTÖRÜ ÖRNEĞİ

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İş geliştirme faaliyetleri, yönetim, rekabet, pazarlama, finansman, risk ve benzeri pek çok konunun aynı anda değerlendirildiği karar verme süreçlerinin yürütülmesini gerektirmekte ve iş geliştirme süreçlerinin güvenilir bilgi kaynakları ile desteklenmesi büyük önem taşımaktadır. İnşaat sektörünün özellikleri ve başarının iş geliştirme ile ilgili verilen kararlara hassas olması, bilgi ve bilgi yönetiminin önemini ortaya koymaktadır. İyi yapılandırılmış bir bilgi yönetim sisteminin en temel basamağını bilginin sınıflandırılması aşaması oluşturmaktadır. İş geliştirme faaliyetlerinin önemine rağmen, inşaat sektöründe bu alanda yapılmış olan çalışma sayısı literatürde oldukça kısıtlı kalmıştır. Bu çalışmanın amacı, literatürdeki bu eksikliğin giderilmesi ve Türk inşaat şirketleri ile yarı-yapılandırılmış mülakatlar gerçekleştirilerek, iş geliştirme faaliyetlerini desteklemek üzere bir bilgi taksonomisi oluşturulmasıdır. Uzman görüşler esas alınarak oluşturulan taksonomi beş ana başlıktan oluşmaktadır: İş çevresi, işverenler, ortaklar, ilgili taraflar ve şirket. Taksonominin kullanılabilirliği uzmanlar tarafından test edilmiş ve iş geliştirme süreçlerinde karar destek aracı olarak, bilgiyi tanımlamak, depolamak, paylaşmak ve geri çağırmak amacıyla kullanılmasının faydalı olduğu ortaya konmuştur. Ayrıca, taksonominin şirketlerde kullanımını göstermek amacıyla bir bilgi yönetim aracı geliştirilmiştir.

Anahtar Kelimeler: İnşaat sektörü, iş geliştirme, bilgi yönetimi, taksonomi, Türk inşaat sektörü

To my beloved family…

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LIST OF ABBREVATIONS

BD	Business Development
BDM	Business Development Management
BOQ	Bill of Quantity
CI	Construction Industry
CIS	Commonwealth of Independent States
CRM	Customer Relation Management
DIKW	Data, Information, Knowledge and Wisdom hierarchy
EI	Expert Index
ENR	Engineering News-Report
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
ICT	Information and Communication Technology
IFC	International Finance Center
IMF	International Monetary Fund
IT	Information Technology
JV	Joint Venture
KM	Knowledge Management
KMS	Knowledge Management System
NPO	Non Profit Organization
OL	Organizational Learning
OM	Organizational Memory
PMBOK	Project Management Body of Knowledge
PPP	Public Private Partnership
QFD	Qualified Function Deployment
R&D	Research and Development
SBD	Sustainable Business Development
SWOT	Strength Weakness Opportunity Threats
TCA	Turkish Contractors Association
UAE	United Arab Emirates

CHAPTER 1

INTRODUCTION

One of the most important issues for an efficient and proper business performance of organizations is the amount of knowledge they possess and their success in benefiting from it. As the level of this intellectual property increases, not only the probability of undesirable outcomes surrounding the performance of the organization decreases but also the organization will progress to better competitive conditions in the market. Knowledge is at a critical level of importance in an ultracompetitive environment due to its vital role in technical know-how, understanding customer needs, marketing techniques, product design, and innovative reorganizations (Park, et al., 2010). In today's business environment, the success of an organization is highly dependent on its knowledge about technical advances, competitive forces, and macro environmental factors. It is only by effectively managing its knowledge resources that an organization can sustain its competitive position in the tense and changing environment (Kivrak, et al., 2008). The high amount of researches conducted in the last decades is an illustration of the importance of knowledge and knowledge management (KM) in the modern business environment.

The construction industry is one of the most complex industries which contain the combination of on-site and off-site activities as well as various scientific fields. Unlike other common industries, construction industry has three main characteristics in general that cause discontinuity in project productions: high risk factors due to rapid market and environmental changes, the unrepeatability of work, and the uncertainty of orders (Park, et al., 2010). It is because of such project characteristics as being unique, temporary, non-routine, experience based, limited budget, tight schedule, and comprising of multidisciplinary features that knowledge management is particularly important in construction companies. As an additional importance for knowledge management in construction companies we can point out the fact that with the retirement, reassignment or the transfer of former projects members to new projects, much of the new knowledge is lost and the lessons that could have been learned from this

knowledge will not be acquired and sheared properly. However a well organized KM system is a remedy for this organizational amnesia.

Despite the high difficulties specific to the construction industry, acknowledgeable efforts have been made for understanding, adopting, implementing KM, and in general inhibiting the many features of KM in favor of construction organizations. Knowledge management is considered as the process which creates value from the knowledge available in the organization by capturing, developing, organizing, and disseminating knowledge throughout the organization to support the decision making process. In this regard, classification plays an important role in organizing and representing a knowledge domain. Classification is one of the main processes involved in accumulating knowledge and shaping it into a powerful representation. Moreover, in order to benefit from the advantages of the semantic web and intellectual knowledge management systems, creating a consistent semantic representation of knowledge has been seen necessary (El-Diraby, et al., 2005). One of the common semantic representations of knowledge is known as knowledge taxonomy. Taxonomy which is coined irregularly from “taxis” and “nomia” (that respectively mean arrangement and method) is known as a conceptual superclass-subclass hierarchy for categorization or classifications of entities in a domain (Fidan, et al., 2011). previous studies (Fidan, et al., 2011) (El-Diraby, et al., 2005) (El-Gohary, et al., 2010) have presented taxonomies for different knowledge domains in construction companies, but no study to be aware of up to now, has offered a semantic classification for the knowledge in business development management (BDM) of construction companies.

Having construction industry as one of dynamic industries available and considering the huge amount of investment in this industry, the effort of different companies to maximize their shear in the available markets is a considerable fact. This brings the extreme attempt for marketing construction services, finding new markets, identifying new clients and any other similar activity which will end to a higher amount of business and income for the construction companies. BDM is comprised of the combination of activities that search and identify the available business or produces new types of business in the existing and potential markets in order to provide new profit channels for the company. Business development management consists of a number of techniques designed to grow an economic enterprise for an increase in final profit. FMI (web2) considers business development as a profit building approach. They believe that BD builds key customer relationships, differentiates a company from its competitive and also expands its markets.

As a result of a highly competitive and dynamic market, the construction industry is a brutal environment for those companies who cannot keep up with the severe competition. Those who cannot adapt themselves with the growing, changing and challenging characteristics of the industry can easily fall out. By this mean; business development activities play a critical role in a company, which aims to maintain and increase its level of business to maximize income, and more over to survive in the competitive market of construction industry.

The term business brings along issues such as; managerial activities, competition, price, marketing, finance, risk, etc. which all of them include a high level of decision making which need to be supported by trustable knowledge. Moreover, High amount of cost and risk in construction projects and the costs of taking part in different tenders, increases the need of making right business decisions. Wang et al (2010) believe that for developing a new business; we need to have knowledge on market, business form, and technology (Zixin Wang, 2010). FMI special report on business development of construction companies; noted that one of the challenges for business development of construction companies is the lack of storing and managing information about customers. More over knowledge shearing is believed to help firms on the road to develop new markets and to increase their competitiveness (Zixin Wang, 2010).

Due to the high dependency of the business development decisions to expert's level of experience, generally business developers are selected among the ones who have a higher experience in deferent aspects of the industry and have understood the relations governing the business environment. It is believed that the knowledge and experience of theses exports play a fundamental role on their performance while approaching different business conditions, therefore this type of matter could be considered very valuable in supporting future development decisions and identifying new businesses. Regarding the vital role of business developers in an organizations survival, this knowledge is among the most valuable knowledge in the organization. Thus, this knowledge should be highly appreciated, captured and managed in order not to be individual dependent and rather to be considered as a firm's asset in providing a competitive edge for the company.

Therefore this study has focused on developing a knowledge taxonomy for business development management in construction companies based on findings of semi-structured interviews with industry professionals. Turkish construction industry has been selected as the

target population for this research. In the recent years Turkish construction companies have shown a considerable growth in the level of their business. By achieving new construction techniques and showing a high interest in opening into new markets such as; Middle East, Africa, CIS and European countries they are displaying a high effort for playing an important role in the global construction market. Therefore it is believed that Turkish construction industry could be a suitable source of information in respect of business development management.

The presented taxonomy is believed to be used for representing, storing, sharing, retrieving and in general, managing knowledge related to business development management of an organization. In addition, the taxonomy can provide bases for creating ontology, management decision support toolkits, and knowledge bases (data base). More over considering the shortage of scholarly literature regarding knowledge management in BD, it is believed that this work can contribute to the literature by providing a good understanding on the semantic nature of business development management in construction companies.

The aim of this chapter is to provide information about the background of the research and the purpose of the study. As mentioned above, the purpose of the study is to develop a knowledge taxonomy for business development management of construction companies to serve in knowledge management and business development purposes. Within the context of this thesis, chapter 2 provides an in dept review of the available literature about business development, its definition, and importance for construction companies. Chapter 3 outlines the literature review on knowledge management. Chapter 4 presents a research background on the topic of this study. Chapter 5 describes the methodology that has been used to develop the taxonomy for the subject domain. Chapter 6 discusses the taxonomy development process and its verification. In Chapter 7, a knowledge management tool that has been developed based on the designed taxonomy will be introduced. Finally in Chapter 8, a conclusion of the study is provided by presenting the research contribution, limitations, and future study directions.

CHAPTER 2

LITRATURE REVIEW ON BUSINESS DEVELOPMENT

2.1.What is business development

Nowadays an economically successful company should encompass technologically up to date end product or services and should be able to adjust with the changing market conditions. More over it ought to have competitive prices and also customer satisfaction. For this reason the companies should be innovative, fast operating, low cost, flexible, and have consistently high quality deliveries. (Hammer, et al., 1993) (Abu Bakar, et al., 2011)

The high level of competition and the scale of projects in construction industry make this area of business potentially brutal in respect of significant fails and bankruptcy. The construction business is a shifting and inconsistent environment which faces rapid changes in the marketplace, so in response of these changes, the corporations must develop to adopt with market needs. Thus, organizations must come up with efficient strategic management, more flexible structures, incrementally improving business processes and good project management. (Merwe, 2002)

Construction is defined as the process of building things, and business is the activity of making wealth by producing or trading goods, or providing services (Longman Dictionary). Therefore; Construction business can be defined as the activity of producing money in exchange of providing construction services such as constructing buildings, bridges, dams, roads etc. hence, Similar to companies in other industries, the initial and fundamental logic behind establishing a construction business is to produce wealth, (Buffett, 1998) (Merwe, 2002) of course this can change for governmental and nonprofit organizations (NPO) where monetary wealth is not always the main desire. But no matter what your inspiration of forming an organization is; developing and expanding your field of performance by technological improvement, cost reduction, improved relations, increased welfare, and so on, for achieving the most from your objectives is a crucial issue.

Business development consists of a number of techniques designed to grow an economic enterprise. Such techniques include, but are not limited to, assessments of target markets and marketing opportunities, product and service design, intelligence gathering on competitors and customers, producing leads for possible sales, following sales activities, proposal writing and business model design, etc. For a company in order to withstand competitors and the changing market conditions, business development process and activities should never stop and it should be an ongoing process. This process involves evaluating a business and then realizing its full potential and shortcomings, using such tools as marketing, sales, information management, risk management, and customer service.

Business development cannot be reduced to simple templates applicable to all or even most situations faced by real-world enterprises. Successful business development management often requires a multi-disciplinary approach. A detailed strategy which may involve financial, legal and advertising plans for growing the business is frequently seen necessary. Creativeness in meeting new and unforeseen challenges and to recognize the chances and opportunities in the fast changing technological environment is necessary to keep an enterprise on a path of sustainable growth.

Business development has recently become more popular in Turkish construction and organizational routines for this activity have changed in the recent decade. In a research Daneshvar (2011) has investigated the business development routine of Turkish construction companies. In her research she has revealed that in the last twenty years due to industry and environmental changes, the BD routine has evolved from identifying available projects in a market and tendering for that specific project to a much more structured and efficient routine. She simplifies the steps of BD for developing business in a previously entered international market as:

1- Defining the potential clients (public or privet)
2- Evaluating the company capability regarding the available projects
3- Identifying potential local partners (if required by regulations or seen necessary to be competitive)
4- Defining a strategy
5- Reaching the targets (by marketing, tendering or direct negotiations)

Figure 2.1 demonstrates the business development flow chart for a previously entered market.

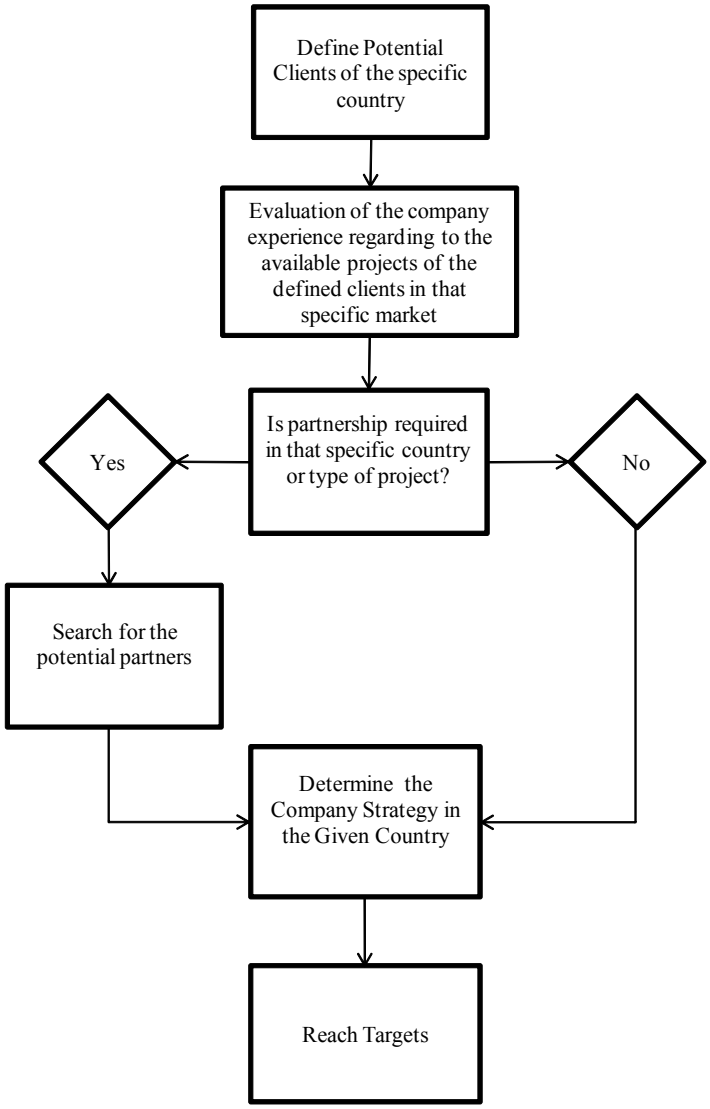

Figure 2.1 Business Development Routine (Daneshvar, 2011)

Business development is a broad term and depending on the business type and policy, Business development could mean different things to different organizations; for some it means sales, for some marketing, for some customer relations and for some a combination of them. FMI considers Business development as a profit building approach. They believe that BD Builds key customer relationships, differentiates a company from its competitors and also expands its markets. FMI mentions that with the right BD plans, a company gets more qualified leads,

develops a long term customer relations, identifies best customers and markets, creates effective marketing connections, comes up with winning proposals and finally gets secure and profitable contracts for an increase in final profit.

It has been seen that; business development sometimes conflates with other managerial functions such as sales, marketing, capture management, business growth, strategy management, customer relations, business process improvement business process re-engineering, organization development etc. it is believed that BD includes a variety of activities which varies from development of services to closing deals.

In the next section we will have a look at the definitions available in the literature for BD.

2.2.Business development definitions

Business dictionary defines business as; "An economic system in which goods and services are exchanged for one another or money, on the basis of their perceived worth. Every business requires some form of investment and a sufficient number of customers to whom its output can be sold at profit on a consistent basis." And development has been defined as; "An extension of the theoretical or practical aspects of a concept, design, discovery, or invention." (Business Dictionary)

In Table 2.1 some of the definitions given by other sources is demonstrated. As it can be seen in table 2.1, there are various definitions depending on what BD means to different authors; it can be an act, role, plan, a business discipline, a process or a managerial construct. But what is considered as business development in this research is; **any activity that searches and identifies the available business or produces new types of business in the existing and potential markets in order to provide new profit channels for the company.** Business development is the main unit which guides a company in order to expand its business in a specific sector or to survive in the competitive market.

Table 2. 1 Business development definitions

Source	Definition
Merwe (2002)	"BD is the act which restructures and modifies the business process for a more efficient performance"
FMI	"The idea of BD is to bring the full range of resources your company has to offer within easy reach of the firm you are pursuing"
Harris and Maccafer (2001)	"Developing a business involves seeking out the customer's material wants and desires, so that the company can organize itself in the best possible way to satisfy those tastes and requirements"
Daneshvar (2011)	"business development is an act which searches new markets and clients, penetrates to the existing markets and searches for new types of projects"
Keki (2009)	Keki (Keki, et al., 2009) mentions business development in construction as; "Selling, typically referred to as Business Development (BD) within construction, is a complex activity where the number of clients is limited yet typically comprises a range of decision-makers supported by consultant advisors managing a portfolio of programs and projects".
Wikipedia	"BD is the combination of responsibilities and techniques that creates new markets, finds new customers, enters existing markets and identifies business types based on current and potential customer's needs"
Sørensen (2012)	"The tasks and processes concerning analytical preparation of potential growth opportunities, the support and monitoring of the implementation of growth opportunities, but does not include decisions on strategy and implementation of growth opportunities"
Austin (2008)	"Any activity that alters the status quo of the business" more over it mentions that business development includes; planning, adding for growth, subtracting for profit, business process improvement, and competitive awareness and advantages"
Rainey (2006)	"A holistic management construct that includes the entire value system from the origin of raw materials to production processes and customer applications to end of life solutions. It encompasses the full scope of relationships and supply networks, customers and stakeholders, and support service providers for providing business solutions and also handling wastes, residuals, and impacts."
Macpherson and Miller (2007)	A combination of; strategic analysis of the business, identifying the business targets and goals, identifying the activities that should be deployed to the business and checking the real condition of your business (STAR).
Kurien (2004)	"A company's team effort of combining various departments of skilled professional expertise to answer ultimately all client questions and to prove to the client why the company should be retained for the project."

2.3.Importance of business development

Depending on top management business policy BD could have different aspects and objectives. It could be a top management issue or it can have a separate department for itself, but the important fact is that a company can never function without having BD activities. Business development crosses the classical barriers between sales, marketing, customer relations, operations and management in order to come up with the development and expansion of the organization. The importance of this managerial function is so much that business developers have been mentioned as the company's champions, (Austin, 2008) which make the tacit explicit. A considerable increase in allocating resources for business development activities of American contractors after the economic downturn (in 2007), demonstrates the importance of business development for the survival of a contractor company in a deteriorating market. (FMI)

Depending on internal resources and external drivers, Business development plays a considerable role in an organization growth. Although firms pay more attention to profit maximization in short terms but in long runs, the main focus of the management of companies are on its growth. Growth is considered far beyond adding property and physical size to a company; it is a multi dimensional growth that includes; growth in asset and employment size, growth in sales and profit and also growth in the variety of services and products that a company can offer. (Abu Bakar, et al., 2011)

There are many reasons that an organization would like to grow such as; benefiting from economies of scale, increasing power in the sector, the ability to resist to changes, increase profit and prestige (Weinzimmer, 2000) and of course that the big companies get less influenced by economical cycles and they have a higher chance of survival in severe conditions due to economic crises (Abu Bakar, et al., 2011) (Keki, et al., 2009). For this reasons many managers have a high intention to nurture their companies to grow to a considerable level in size.

A firm's growth can be measured from different aspects such as increase in investment and employees (inputs), market shear and assets (value), sales/turnover and profit (outputs) (Abu Bakar, et al., 2011). Weinzimmer (2000) mentions three sets of determinants of organizational growth as; industry attributes, organizational strategies and top managements characteristics. He believes that organization growth rate has straight relation with industry growth rate. As for

industry attributes, he believes advertising intensity, R&D intensity and competitive concentration produce entry barriers for new entrants and therefore produce a much calmer atmosphere for incumbent firms to grow. For strategy determinants of growth, he points out portfolio level strategy as portfolio diversification of industries and also competitive level strategy which addresses the way that a company competes with its rivals in a particular industry. And finally for top management determinants of growth; he mentions that heterogeneity in top management industry field, heterogeneity in functional experience and age of top management has a constructive effect on organizational growth (Weinzimmer, 2000).

In their research, Abu Bakar et al (Abu Bakar, et al., 2011) have identified the factors effecting a construction company's growth. Table 2.2 shows the ranking for the identified factor based on Malaysian construction companies.

Table 2. 2 Growth factors ranking of Malaysian construction companies (Abu Bakar et al, 2011)

Growth Factors	Rank
Good management of company	1
Good cash flow management	2
Sufficient knowledge and experience	3
Good team members	4
Technical expertise	5
Good site management	6
Commitment to customer satisfaction	7
Availability of capital	8
Availability of skilled workers	9
Good relations with clients	10
Internal efficiency	11
Maintaining high quality of products	12
Availability of bank loans and other credit	13
Political stability and peaceful environment	14
Effective organization structure	15
Competitive prices of products/services	16
Market specialization	17
Open economic policy of government	18
Government assistance/tax incentives	19
Technological edge	20
Upgrading and educating members	21
Use of new technology and automation	22
Focus on job safety and security	23
Active in innovation	24
Active in research and development	25
Diversify expertise	26
Forming joint venture	27

They have concluded that in Malaysian companies the top ten most important factors that contribute to the growth of construction companies are: Good company management; good cash flow management; sufficient knowledge and experience; good team members; technical expertise; good site management; commitment to customer satisfaction; availability of capital; availability of skilled workers; and good relations with clients. These factors should be appropriately be given more attention by construction companies that aim to achieve growth in their firms.

Business development finds its significance by finding loyal and profitable customers and keeping the contracts coming. By using relations, business developers come close to costumers and provide them with high quality of services which brings them the desired level of satisfaction. (Keki, et al., 2009)

In general business developers are salesmen for construction services, thus without a good BD performance in a company, no matter how good and qualified you are you can't properly offer your work in exchange to money and hence you can't earn the true value of your effort. Business development brings reputation to the company among client, suppliers, consultants and many other parties involved in the industry. Business developers build good relations with clients and consultants and this creates more reliable working relationships by decreasing transaction costs and having a deeper understanding of customer preferences. This ends to adding value to the business and aids the project problem solving procedure. By managing the relations between them and providing a win-win situation for different parties, business developers provide a pleasant and satisfying business environment. (Keki, et al., 2009)

Business development shifts the company from a passive business policy which is reacting to the opportunities which come to them, to a proactive position which is exploring and finding or creating good business opportunities before others. From the management point of view of some companies, it is believed that a lower price would be sufficient for building a business. This attitude is mostly seen in periods of market recession when companies concentrate on projects rather than clients, or when the company doesn't have any development strategy. Therefore; by reducing costs they try to get a wining lead. This could be a temporary strategy for specific conditions but it is not a sustainable advantage (Abu Bakar, et al., 2011). Clever clients are seeking contractors that will offer them with a package of extra benefits that will give them a secure condition and reduce uncertainty and risk rather than the cheapest price (Keki, et al.,

2009). Based only on price, no guaranteed business is achievable. Findings show that, by having a customer based relationship marketing and having BD activities such as; identifying sector growth plans, identifying key customers and evaluating opportunities based on importance for the clients and chances to win, you are 3.65 times more likely to win projects compared to transactional project based approaches. (Keki, et al., 2009) Therefore business development plays an important role in winning new projects and building profitable relations.

Finally, we can mention that BD reduces business risk and cost by maintaining business relations and the company's position in a market. Because of the lower cost and effort, companies prefer to expand their business in markets that they already know about and with customers which they have already worked with (FMI). Preece et al believe that; retaining satisfied customers is 6 times cheaper than acquiring new ones (Preece, et al., 2003). Therefore; providing repeated business for the company is among other benefit of business development. Repeated business provides a steady work load and income, mitigates risk, and reduces costs and durations. It is by maintaining clients and repeating business that a company can build a market share for its self. (Keki, et al., 2009)

2.4.Objectives and responsibility of business development

Business development aims to increase business of an organization, improve business process and to make new dependable and strong relations (Merwe, 2002)

Business development professionals have a wide range of responsibility altering from development of products and services over to negotiating and closing deals in order to bring in more revenue. Business developers should come up with attractive packages to the client and thereby have more control over revenue. For this reason, business developers can play an innovative role by identifying, assessing, planning, and establishing businesses that the client could initially be or not be aware of.

From one point of view, business development can be compared with the lookout of a sailing ship. It identifies the threats and opportunities in order to show the best path to sail. It is only with the information of the business developers that the management, who play the role of the captain of this ship, can lead the ship to its correct destination. From another point of view, we can compare business developers to the ambassadors of a country which represent the country

and manage the relations of two countries based on government policies. They gather strategic information about specific subjects in order to illustrate the reality, this would help the governors of own country to take the right and necessary actions so that they can benefit from opportunities or dispose potential threats.

Based on the condition and strategy of the company business developers can have different responsibilities. At good times when jobs are coming through the door, business developers are responsible for maintaining their relations with customers and strengthening the ties with them in order to keep the condition steady. Thus at this time the main responsibilities of business development personnel is to keep the name of the company, in front of the clients (FMI). According to Macpherson and Miller's eighty to twenty rule; 80% of a firms business is generated by about 20% of its clients (Macpherson, et al., 2007). Preece et al (2003) believe that; retaining satisfied customers is 6 times cheaper than acquiring new ones. So; maintaining, and transforming clients into loyal customers are among BD main objectives.

At economical down turns or in the case of companies who plan to grow to a desired level, BD objectives is to establish new and profitable businesses by finding new markets, client and projects and also maintaining the current business of the company. BD managers should seek opportunities for future work that are informed by detail prior to the invitation for a tender in order to be able to build relationships with preferred consultants and clients. (Keki, et al., 2009) So it is at these times that BD finds a high level of importance for the mobility of a company.

So generally speaking we can say that the objectives of business development in a construction company could mainly be maintaining relationships and finding new deals. In the fallowing some more sets of responsibilities and objectives introduced by different sources are presented.

FMI introduces the different responsibilities of business development process as:

- **BD assessment** which is identifying the weakness and strength points of your current business
- **Market research and analyses** which aims to understand the business environment
- **Target marketing** that identifies the competitive advantages of your company in order to achieve a higher success in your proposals

- **Differentiation strategies** which is coming up with efficient strategies with the focus on your customer needs
- **Competitive positioning** is setting your strategies based on your key competitors and market position
- **Implementing a market driven plan** this aligns your internal BD resources and establishes a strong brand in the market.

In general FMI believes that based on your company condition and the market environment, you design a strategy that demonstrates your competitive advantages, covers your customer's needs and also considers the rules of competition.

Macpherson and Miller (2007) have stated different parts of a business development plan as:

- **Strategic analyze** which is identifying what needs to occur in your business in order to take you to the next level, or in other words; understanding your current condition
- **Targets and goals** is where you want to see yourself in future
- **Activities** that should be deployed on an ongoing business in order to meet the targets
- **Monitoring and checking** you business in order to see the reality of your business in order to evaluate your plan.

As it can be seen above, business developers are responsible for evaluating the performance of a company and identifying the gaps in the system as well as coming up with targets and an approach for the company based on the information they have gathered from the market environment. Therefore we can conclude that; business is a combination of parts which collaborate with each other to make profit. And a business development has the duty of identifying the weaknesses and strength points of this system.

Martin Austin has indicated some of Business developer's responsibilities in a biotechnology and pharmaceutical industry as fallowing:

- Business developers must look for creating more value for the business by foreseeing the future of technology, products, processes, direct and indirect competition and threats. They should look far and wide at their situation and do not stick to their own technology and see only their nearest rivals.

- Business developers should offer choices to add new products or companies to the portfolio of the company in order to grow. In case of mature companies should have different scenarios to subtract for profit, such as dividing products and reducing activities which are disturbing resources or lowering profit.
- Business developers should collect data from business process, analyze it, identify deficiencies and come up with solutions for the business process distractions and idleness.

From Austin's point of view a good business developer which he mentions them as the champions of the company, should be aware of all the interactions in different parts of the company, they should take action on issues, study business environment, carefully plan value making options and take charge of change processes in the organization without usurping the decision making and management role of senior management.

In addition, by looking at job description and job offers for business development managers it can be also understood that what are the main objectives and duties of a BD in a company. Below is a list of responsibilities for Business development management held accounted:

- Following up new profitable business opportunities by prospecting potential clients and the demands for new services in the market.
- Arranging and preparing presentations and meetings with the authorities about services, innovations and performance of your company.
- Establishing effective relationships with key agencies and preserving them
- Keeping track of the development in marketing literature
- Prospering reports for management about market feedbacks
- Ensuring the business growth throw managing business development activities based on company strategy.
- Having contribution in refining and developing company vision, creating an organizational culture and reputation.
- Support the management in decision-making to ensure the organization maximizes its short, medium and long-term profitability.
- Leading, managing and developing the business development team so that the targets and strategies of the company are totally understood and executed.
- Investigating and analyzing the market to understand its demands

- Carrying out market analyses in order to predict the business changes to minimize the damages.
- Identify your competitors and understand their business condition and strategy
- Assessing the company's assets and conducting/managing marketing, advertising and promoting activities of company's services.
- Business developers should identify and negotiate with potential partners and also manage partnering relations so that the parties mutually benefit, and the company's performance in the market would increase.

From what has been said so far, we can generalize the overall responsibilities of BD as; managing interactions between the company and other parties in the business environment on behalf of increasing the final profit of the company.

Finally it should be mentioned that the responsibilities of BD department can differ from one company to another based on their management preferences, human resources, organizational structure, and etc.

2.5.Previous work on business development

Reviewing the literature reveals that this field of research has been recently introduced and there is still a lot of investigation needed to fully develop this domain. Certainly, there has been researches conducted on business improvement and strategy, marketing, partnering, choosing international markets, bid/no-bid decisions and etc. which are different aspects of business development, but to my knowledge a little work has been conducted which investigates business development as a managerial act inside construction organizations.

In a study, Kurien (2004) investigates the different BD strategies implemented by American construction companies for market diversification by using questioner survey. This research had 4 main findings which were; (1) the respondents prefer to inter markets which they can have monopoly. In other words; contractors target markets with less competition or the markets that they have competitive and technological advantages. (2) Some companies prefer to target one particular project to enter a new market. It is during that specific project that the company can decide to stay or leave the market. Some other companies fallow their clients into new markets since it is less risky. (3) Some contractors proffered to team up with such local players as:

subcontractors, suppliers, laborers and etc. This preference is mainly because of overcoming problems of unfamiliarity with competitors, legal aspects, regulations and economical forces in a new market. (4) Many companies have expressed that good public relations was important to stay in business. It was indicated that 50 % of the work was obtained through repeated clients pointing out the importance of relationship selling. Some further recommendations for a successful business development performance of construction companies are also given by Kurien.

As one of the leading management consulting organizations FMI provides reports and conducts surveys about business development in construction industry in order to support companies. Although these articles contain valuable information for the sake of business activities in construction companies, but they lack the specifications of an academic publication and more over they are based on FMI's understanding on BD which is stated by Cynthia Paul (practice leader for business development in FMI) as: "marketing, sales and customer service" in working with clients.

Kind and Knyphausen-Aufseß (2007) have conducted a research in order to answer the question of "what is business development?" in the case of biotechnology. In their work they have provided information on business development about how BD tasks are defined and how they are fulfilled, what resources are used for this function and how it is organized. Also they have shown that business development is an example of what a modern type of planning might look like and they pointed out that in the context of biotechnology industry, BD has a lot in common with the refined strategic planning proposed in the literature. Despite their appreciated work, this study is concentrated on biotechnology industry and is not exactly applicable for construction industry.

Bagwell (2008) has investigated the role played by transnational family networks in ethnic minority business development in case of Vietnamese nail-shops in the UK. The study has attempted to provide some vision into how Vietnamese nail-shop owners use their informal networks to support the development of their business. In this study two research questions were answered. The first question is that "How do Vietnamese businesses in the nail-shop sector make use of their networks?" It is revealed that there is a heavy depended on strong family network ties for almost everything related to their business development. It is the international family links with relatives in America that have played a key role, particularly with respect to

the development of the business idea and training. As for the second question which asks: "What role might these networks play in facilitating or hindering break-out?" the study has found that; it is clear that the heavy concentration of the Vietnamese in the nail sector is due to the influence of these networks, and also a range of economic and cultural factors have also been important. In this research business development has not been considered as a managerial act and it has focused on non-related to construction topics.

In the literature it can be seen that Business development sometimes overlaps with marketing and it is seen that interchangeably they have been used as synonyms. But it should be clarified that marketing is considered as a tool for business development purposes and BD covers a wider range of management functions.

In an early research Arditi and Davis (1988) investigated the level of different marketing aspects among construction contractors and reviled that there were no significant differences concerning these aspects when comparing the size, type of the work under taken, percentage of public bid, or percentage of new clients. But it was finely clarified that the construction professionals believe that marketing activities are at a high level of importance and it should be considered as a vital activity for the company's business, but evidence show the value of a well adopted marketing program was not fully understood and implemented in the industry. In a more recent research Dikmen et al (2005) studied the marketing orientation in Turkish contractors and found some deviation in Arditi and Davis (1988) results in favor of higher implementation of marketing management in the construction industry, but however more effort was to be expected. Today It is clearly seen that because of the high level of competition, construction companies are dedicating more attention and resources to the marketing and business development of their company in order to provide a competitive lead in the market.

In another research Arditi et al (2008) has surveyed the marketing practices of 65 US contractors to determine the extent which they are implementing the modified marketing mix theory. It was revealed that the 5p's of marketing are used in a decreasing order of: Product, Price, place, promotion, and people. The results of this research it was believed that US contractors allocate more than 1.5% of their annual revenue to marketing practices. In addition it was seen that there is no considerable difference between importance weights of the marketing 5p's related to company size, contract winning methods, or the rate of success in getting new contracts.

In a similar work Polat and Donmez (2010) have investigated the marketing management functions of Turkish construction companies via a questionnaire survey of 71 Turkish contractors. In their research they have reviled that The weighted importance scores of the 5P parameters of the modified marketing mix were ranked by the respondents as: Place, Price, Promotion, Product, and People, having 'Training estimators' as the most important and 'providing event/travel tickets' the least important marketing activity. The research also found that 73% of the respondents managed there marketing activities by top level managers, 75% of the respondents formally budgeted for marketing activities. Finally Polat & Donmez (2010) concluded that Turkish contractors should carry out all of the traditional marketing practices in order to differentiate themselves in the market, and thereby as the ultimate goal they should create competitive advantages for achieving client satisfaction by the means of product and/or service differentiation.

The shortage of literature which focuses on topics regarding different aspects of business development as a managerial act was one of the main inspirations for this thesis. By having a general view over the concept of BDM, in this research it is believed that providing a taxonomy for the knowledge surrounding BDM in construction companies, would provide a good contribution to the literature on understanding the BDM concept. Therefore this work could be an appropriate base and reference for future works related to any subject associated to BD.

CHAPTER 3

LITRATURE REVIEW ON KNOWLEDGE MANAGEMENT

3.1.What is knowledge?

The attempts to understand the nature of knowledge goes back long in history. Plato initially defined knowledge as "justified true belief" and this concept has been argued over the centuries by other philosophers such as Aristotle, Descartes, Kant and Polanyi. In the recent years these attempts have acquired a higher attention due to the increased level of interest in the discipline of knowledge management in literature (Rowley, 2007).

There is an agreement among the researchers about the difficulty of defining knowledge. Knowledge is typically defined with reference to information, while some discuss the processes that convert information into knowledge, for instance processes such as; internalization with reference to cognitive frameworks, belief structuring, study and experience. Other authors identify the added ingredients to information in order to convert it into knowledge examples for this ingredients could be; value, experience, rules, skills, understanding, perception, common sense and etc (Rowley, 2007).

Through the literature review conducted in order to identifying knowledge, it was realized that most of the researches that discuses the concept of knowledge have mention the Data, Information, Knowledge and Wisdom (DIKW) hierarchy in their research. DIKW hierarchy is used to relate data, information, knowledge, and wisdom, with respect to each other and to describe the processes of transforming an entity at a lower level to the higher level entities in the hierarchy. The definitional role of the DIKW hierarchy places it as a fundamental model of information management, information systems and knowledge management (Rowley, 2007). Of course there have been many different presentations of the hierarchy in the literature (Choo, 2006), (Chaffey, et al., 2005), (Macpherson, et al., 2007), (Awad, et al., 2004), but what is common in these works is that the main elements of the hierarchy from the lower level to higher

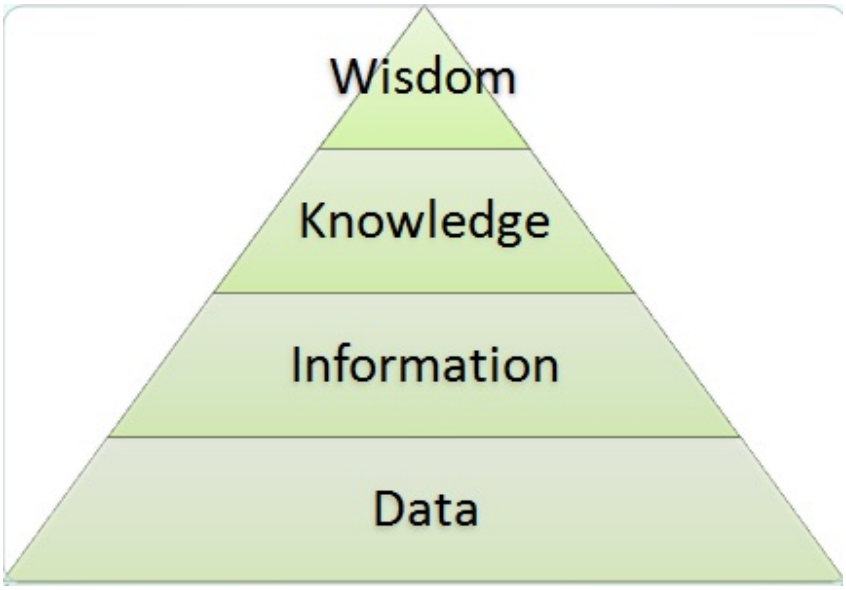

Figure 3. 1 Knowledge Hierarchy (DIKW)

levels are; data, information, knowledge and wisdom (Figure 3.1) and each element is defined by the lower elements associated with a transformation process.

Many authors have mentioned Ackoff's 1989 article with the title of "From data to wisdom" as the origin of DIKW hierarchy. In this article, Ackoff gives definitions for data, information, knowledge, understanding and wisdom as different contents of human mind and investigates the processes that are related to the transformation of different elements of the hierarchy in to each other. He explains each of the higher entities in the hierarchy includes the categories that fall beneath it. For example, there can be no knowledge without information and no information without data.

Data and information have been defined throw out different information systems and Knowledge management textbooks but what is seen in these definitions is that data is generally accompanied with what data lacks such as; meaning, value or organized structure and information in the other hand is defined in terms of data, and is seen to be structured data which is valuable, functional, relevant and meaningful (Rowley, 2007)

In traditional epistemology there are three kinds of knowledge: practical knowledge, knowledge by acquaintance and propositional knowledge (Bernecker S, 2000). According to Zins (2006); practical knowledge is the knowledge such as skills (knowing how), knowledge by acquaintance is knowledge related to knowing a person or a thing and finally propositional knowledge is in the form of knowing a propositions which by itself is divided into inferential and non-inferential knowledge. Furthermore Zins mentions two approaches for defining knowledge; the first approach is the subjective approach which is characterized as a justifiable true belief of an individual. The second approach is the objective approach which is an independent objective existence of knowledge. In this approach knowledge is a collection of concepts, arguments, experiments, observations and rules of inference. They are true and exist separately of the subjective knowledge of the individual. Of course subjective and objective knowledge is related in a way that objective knowledge is the externalized, recorded or documented subjective knowledge.

From another point of view, some of the knowledge management texts believe that knowledge is based on information for example they consider knowledge as; processed, accountable, belief structured, justified and understandable information (Barnes, 2002) (Choo, 2006). Zins (2007) steps further and believes that Information is a type of knowledge, rather than a transitional stage between data and knowledge. Davenport and Prusak (1998) have given a comprehensive definition for knowledge as: knowledge is a "fluid mix of framed experiences, values, contextual information and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knower's. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms".

Table 3.1 demonstrates some other definitions available in the literature for knowledge.

Table 3. 1 Knowledge definitions

Source	Definition
Chaffey & S. Wood, 2005	"Knowledge is the combination of data and information, to which is added expert opinion, skills, and experience, to result in a valuable asset which can be used to aid decision making"
E. Turban, 2005	"Knowledge is data and/or information that have been organized and processed to convey understanding, experience, accumulated learning, and expertise as they apply to a current problem or activity"
D. Boddy, 2005	"Knowledge builds on information that is extracted from data [...] While data is a property of things, knowledge is a property of people that predisposes them to act in a particular way"
K.E. Pearlson, 2004	"Knowledge consists of that mix of contextual information, values, experience, and rules […] Knowledge involves the synthesis of multiple sources of information over time. The amount of human contribution increases along the continuum from data to information to knowledge"
K.C. Laudon, 2006	"Knowledge is information combined with understanding and capability; it lives in the minds of people"
E.M Awad, 2004	Embracing a wider sphere than information, knowledge includes perception skills, training, common sense, and experience. It is the sum total of our perceptive processes that helps us to draw meaningful conclusions
(P.F.Drucker, 1989)	"Knowledge is information that changes something or somebody, either by becoming grounds for actions or by making an individual (or an institution) capable of different or more effective action"
(Nonaka, 1994)	"Information is a flow of messages, while knowledge is created and organized by the very flow of information, anchored on the commitment and beliefs of its holder"

Knowledge has been classified to different types in the literature. The most widely accepted classification is the distinction of knowledge into "explicit knowledge" and "tacit knowledge". As cited by many authors, Polanyi (1966) was one of the first to come up with this classification. From Polanyi's (1966) definition, tacit knowledge is highly personal and difficult to codify, it is stored in human minds and it is difficult to see, share and manage. Tacit knowledge is deeply rooted in action, commitment, and involvement in a specific context. Tacit knowledge may include problem descriptions, explanations of problem solutions, suggestions, and know-how explanations (Lin, 2008). Based on Nonaka et al' (2000) point of view, tacit knowledge is more subjective and experience based, not observable thus not easily expressed, understood, communicated or measured. Tacit knowledge is deeply rooted in action, ideals, commitment, procedure, routines, values and emotions. From the other hand, explicit knowledge

can readily be codified in words, symbols and numbers; it can be easily transmitted in formal, systematic language, and it can be stored as written documents or procedures and made available for others. Specifications, textbooks, and design codes are some examples of explicit knowledge in construction industry. (Kivrak, et al., 2008). Explicit knowledge has been defined by Nonaka et al. (2000) as the knowledge that can be expressed in formal and systematic language and shared in the form of data, manuals, scientific formula, or specifications amongst a variety of knower's.

From the construction industry point of view, experience as one of the main forms of tacit knowledge in organizations, is considered as the acquired knowledge and skills in projects (Manavazhi, 1995). Experiences related to construction are the knowledge related to construction methods, field operations and prior projects. This knowledge can be problem descriptions, explanation for problem solutions, suggestions, and know-how explanations. The explicit form of experience can be codified and transmitted in a formal language and could be acquired from documents, including reports, articles, manuals, patents, pictures, images and video (Lin, 2008).

3.2.What is knowledge management?

In this section, subjects related to managing knowledge as one of the most important asset of an organization in the knowledge-based economy (Stewart, 1997) will be presented.

For creating value from the available knowledge in an organization, knowledge must be focused, current, tested, shared, and used. This attention and sharing of knowledge has become one of the most concentrated topics in business and it is called 'knowledge management' (Mohd Zin, et al., 2010). In regard to the resource-based view of the firm, (Penrose, 1959) (Wernerfelt, 1984) sustainable competitive advantage is strongly based on the rarity and inimitability of firm's resources. Considering the available knowledge inside an organization as its intellectual asset and intangible resource, the knowledge that a firm holds is one of its most precious (difficult-to imitate) resources. More specifically Tan et al (2007) points out that the competitive advantage of an organization lies in the knowledge residing in the heads of its employees and the capability to harness the knowledge for meeting its business targets. So as a result in today's uncertain and global market competition, organizations should manage their knowledge as one of their key factors to benefit the most from it (Mohd Zin, et al., 2010). The recent Increases in

knowledge management practice by organizations illustrate the rising of awareness about KM advantages (Tan, et al., 2007).

Knowledge should not be considered undividable from the person or the group that holds it (personalization) or seen just as a product that can be isolated and codified (codification). Instead knowledge needs to be considered as the belongings of the system, and placed within the context (Connell, et al., 2003). Knowledge management is often used to describe the processes of an organization to develop, organize, and shares knowledge toward achieving competitive advantages in the market (Davenport, et al., 1998). Mohd Zin and Egbu (2010) conclude that knowledge management basically involves the mixture of diverse but supporting processes, procedures, fields of study, and technologies needed to bring about a sustainable environment enabling knowledge to be appreciated and benefited to create value for the organization. From Mason and Pauleen's (2003) point of view, the purpose of a knowledge management strategy is to facilitate learning and the creation of new knowledge by teaching individuals where to find appropriate organizational knowledge, how to use and apply it efficiently and to share and disseminate it appropriately. Lin (2008) has defined knowledge management as "a collection of processes governing creation, storage, reuse, maintenance, dissemination and utilization of knowledge". Williams (2008) points out the dominant discussions of KM as "to capture, codify, use, and exploit the knowledge and experience of employees by developing better tools and methods and by developing a willingness and ability to use those methods". Laudon and Laudon (1998) define KM as "the process of systematically and actively managing and leveraging the stores of knowledge in an organization." From what have been said we can conclude that KM is mainly about getting the right knowledge to the right person at the right time to support their professional performance.

In recent literature KM has been studied under such titles as organizational learning, organizational memory (OM), experience management, and lessons learned. Each of these literatures has been studying knowledge management in organizations with emphasizing on one of its segments such as knowledge capturing, storing, or sharing. Ozorhon et al (2005) has mentioned that the aim of knowledge management system is to support organizational learning (OL) which is about management of knowledge and formation of an organizational memory (OM). This OM would help the organization to develop itself in light of the past lessons learned and information gathered from external sources (Dikmen, et al., 2005).

Capturing the lessons learned as one of the aspects of KM, is one of the main processes of a project's management group. PMBOK (PMI, 2008) states that "the causes of variances, the reasoning behind the corrective action chosen, and other types of lessons learned should be documented so that they become part of the assets of an organization". The learning accumulated at the end of a project will dissipate unless special attention is paid to collecting, storing, and disseminating it (Williams, 2008). After projects are completed; experts usually accumulate domain knowledge and valuable experience and do not share this experience with others (Lin, 2008). Thus with the employee turnover or retirement, the company is vulnerable to loses one of its precious assets. With the help of well developed KMS this threat can offset. More specifically we can say that, in order not to repeat the past mistakes and to have a mature project management, you should properly manage the lessons learned (Krezner, 2000). Learning from experience also prevents problems to be solved from scratch, since; problems that have already been solved do not need to be solved again (Lin, 2008). Therefore best practices and the lessons learned are the foundations for a proper organizational knowledge (Williams, 2008). It should be concluded that from a knowledge management point of view, any type of valuable knowledge (e.g. innovations, best practice) should be managed in order to benefit the organization.

On his review about lessons learned from projects, Terry Williams (Williams, 2008) has pointed out some of the most important reasons for managing learning in projects. These reasons can also be considered for justifying the importance of knowledge and knowledge management. Below are a summary of the points mentioned by Williams:

1- KM improves the project management performance of the organization.

2- Knowledge is used for assessment, risk analysis, or initial planning of the next projects.

3- Knowledge is used to improve the decision making process of the management.

4- KM is important for disseminating knowledge with in the project team, to other projects, and even to other organizations in alliances.

5- Audits for lessons learned, help senior managements to check out the performance and expertise of their personnel.

6- KM can play a key role at the stage-gates of the new product development process.

7- Knowledge from learning from projects can lead to changes in an organization's strategic focus.

Similar to other types of management, organizations implement different strategies in order to reach designated targets for knowledge management purposes. Based on Mohd Zin and Egbu (2010) literature review on knowledge management strategies, we can generalize different types of approaches to knowledge management in to two main categories:

1- The first approach is based on information and communication technologies (ICT). It focuses on actively unifying the organizations knowledge assets and also to increases the flow of capturing, codifying and transmitting knowledge. In this strategy individuals strive to encode their knowledge into knowledge repository, as well as retrieving knowledge they need that other individuals have provided to the repository. For this reason; it concentrates on knowledge documents, creation, storage and reuse in computer based corporate memories. These types of approach are mentioned as "codification" approach or "push strategies" and have a higher efficiency on explicit knowledge.

2- The second approach is based on the people and organizational behavior. In this approach, knowledge is closely tied to the person who developed it and is shared mainly through person-to-person contact therefore their motivation and attitude are seen as important. In this approach individuals make knowledge requests to experts associated with a particular subject and the expert individual(s) can provide their opinion to the particular person or people needing it. ICT in this approach is to help people communicate and expedite knowledge management practices. This approach emphasizes on tacit knowledge and it is known as "personalization" approach or "pull" strategy.

3.3.Knowledge Management in construction industry:

While the current global economy can be specified by the intense level of business competitiveness, high performance organizations, the convergence of services and products, and

by vast technological improvements, the risks and uncertainties with in such a dynamic environment make the management of organizational knowledge even more crucial. Construction projects are temporary and unique and consist of multidisciplinary groups working together. As a result generally when project member move on to new projects, resign, or retire, much of the new knowledge is lost and also the valuable lessons that could have been learned from this knowledge are not stored or disseminated properly. Moreover, the project base characteristic of the industry causes learning to be difficult and precious knowledge to easily be forgotten as time goes by (Park, et al., 2010).

Previously it has been empirically proven that KM has helped the improvement of performance in the manufacturing industries in terms of the quality, reliability, time, and speed while decreasing the production costs (Armstead, 1999). In the construction industry knowledge is considered as a critical resource, not only because of carrying out projects successfully, but also for choosing the right projects and preparing winning bids. The main benefits of KM for the construction industry as a knowledge based industry have been mentioned as reduction of project time and cost, improvement in quality, and to provide a major source of competitive advantage for the organizations (Kivrak, et al., 2008). More over Zin and Egbu (2010) have mentioned the benefits of KM for construction industry as: (1) Innovation, (2) performance Improvement, (3) Improved project delivery, (4) Facilitating the transfer of knowledge through a variety of project interface, (5) Increased intellectual capital, (6) quicker respond to clients' needs and other external factors, (7) Improved support for knowledge workers, (8) Retain the tacit knowledge , (9) Increased value, (10) more agile organizations and a better respond to organizational changes, (11) and Risk minimization. Due to the labor-intensive characteristics of the construction industry and Since most know-how, know-what, and experience exist in the minds of the individuals it is recommended that knowledge management strategies which take individual experience into account should be introduced to the construction industry. (Park, et al., 2010)

The Major derivers for KM in construction industry have been mentioned as the need for innovation, dissemination of best practices to key sets of employees, retention of the tacit knowledge of key employees, continuous improvement of business performance, client satisfaction, sharing valuable tacit knowledge, encouraging continuous improvement, disseminating best practices, quick response to customers, and reducing rework (Kivrak, et al., 2008) (Mohd Zin, et al., 2010). From the other hand, some of the barriers for implementing a

successful KM system in construction industry have also been investigated by different authors (Carrillo, et al., 2004) (Dainty, et al., 2005) (Egbu, 2004) and as a summary of their work we can have the fallowing list as the major barriers:

1- Unsupportive organizational culture

2- Poor communication structure

3- Poor information technology infrastructure.

4- Time constraints of the knowledge experts

5- Lack of standard work process

6- Lack of sufficient funding

7- Lack of accepting knowledge as an important asset

8- Lack of a appropriate methods and tools for measuring and valuing knowledge

9- Reluctant to the use of IT tools for knowledge management

Knowledge management in a company should be rather in an active position than a passive position and the top management and knowledge experts play a critical role in this issue. In their work; Moffett et al (2003) presented a comprehensive list compounded of 10 factors which have been identified for a successful knowledge management system in an organization. The list is presented below:

1- a friendly organizational culture

2- senior management leadership and commitment

3- employee involvement

4- employee training

5- trustworthy teamwork

6- employee empowerment

7- information systems infrastructure

8- performance measurement

9- benchmarking

10- knowledge structure organization

Many studies have been conducted on KM processes and stages and different authors have used various terms for the same knowledge management stages or processes however what differentiates each of these is the difference in perspective, focus, and level of detail (Tan, et al., 2007). Bhatt (2001) described the sequence of the knowledge management processes as: knowledge creation; knowledge validation; knowledge presentation; knowledge distribution; and knowledge application. However, it is considered that knowledge management processes may not exist in that linear order. More over there may be some iteration between the knowledge management stages and some may merge, overlap or exist simultaneously (Demarest, 1997). Tan et al (2007) mentions the major stages of a knowledge management process as: knowledge capture, knowledge sharing, knowledge reuse, and maintain knowledge. In the following parts of this chapter, some of the main stages in a KM process will be explained.

3.3.1.Capturing Knowledge

As firms become increasingly more innovative and project-based the need to capture the valuable learning and knowledge from projects and making it available throughout the organization for use in future projects is further recognized (Scarbrough, et al., 1999). Knowledge acquisition is the most important and initial step in knowledge management and it is after acquiring knowledge that you can store or share it (Dikmen, et al., 2005). For this reason,

first, the available sources of knowledge should be identified, later based on learning and knowledge acquiring mechanisms, the recognized knowledge should be obtained. Tan et al (2007) has mentioned that capturing knowledge comprises of three sub categories:

1- Identifying and locating knowledge: identification of the types/categories of knowledge to be managed, and their sources.

2- Representing and storing knowledge: This deal's with indexing, organizing, and structuring knowledge into thematic categories and providing a standard format for authoring knowledge.

3- Validating knowledge: knowledge validation intends to ensure the credibility of the knowledge captured and also that it is in the required format.

Knowledge sources for an organization can be divided into external and internal sources, and organizational knowledge. Parties related with the organization such as suppliers, clients, partners, and etc. comprise the external sources of knowledge. It is believed that involving in international projects, partnering with different companies, and conducting business with different supply chains are important for acquiring knowledge and coming up with new innovations. Other examples for external sources of knowledge could be universities, conferences, seminars, exhibitions, academic publications, knowledge brokers and internet. The internal sources of knowledge involve company documentations, data/knowledge bases, reports, project team meetings, intranet/extranet and personal libraries. Finally the organizational knowledge is the intellectual capital of the organization, which comprises of personal skills, experiences of the employs and cross organizational knowledge (Kivrak, et al., 2008). In their work; Dikman et al (2005) have noted some of the knowledge sources for capturing knowledge in a construction organization. They have categorized these sources into three groups as shown below:

1- External sources: External seminars (given by external bodies), internet, congresses, exhibitions, trade shows, publications (books, journals, etc.) academic studies.

2- Other parties: Domestic and international client, JV partners, competitors, governmental bodies (related with construction), universities, consultants, Foreign organizations other than

clients, Non-governmental organizations (chamber of civil engineers, etc.), associations (association of international contractors, etc.)

3- Organizational learning: Internal benchmarking, competitive benchmarking, Value chain analysis, Environmental scanning, process-based project learning (post project apprisal, after action review), Documentation based project learning (learning histories, case-based articals).

After identifying different sources of knowledge, organizations should learn from them and come up with ways to capture the available knowledge. Of course the biggest challenge in this stage is about capturing the tacit knowledge.

Schindler and Eppler (2003) suggest two types of methods for collecting and storing knowledge. The first set of methods which are named "documentation based methods" consist of project evaluation, micro articles, learning histories and formation of case bases using computer programs. These sets of methods are generally used to store experiences in project-based companies. Definition for each of these methods is given below:

Project evaluation: documentation of project experiences during or at the end of the project.

Micro articles: method to store experiences of people after completion of a project involving cause-effect relations, solutions to problems and keywords related to the topic.

Learning histories: cover chronological progress, actions taken and results of the decision in a 20-100 page report written by one person by making references to other project members experiences.

Formation of case bases: case bases related to a project's critical success factors, productivity, performance scores, etc. are prepared on computer so they can be recalled when similar cases happen.

The seconded sets of methods are known as process-based methods and include two types of methods known as post-project appraisal and after action review. These methods focus on the sequences during project's time line. The definitions for each of these methods are given below:

Post-project appraisal: documentation method performed by an external post-project appraisal unit usually one to two years after project completion; it covers all project information (market, parties, etc.) and the results of strategic decisions so the company can learn from mistakes and the transfer knowledge

After action review: collection and storage mechanism performed after each decision stage that covers the answers to questions such as: What was supposed to happen? What actually happened? Why were their differences? What can one learn from this experience?

Some other tools for capturing tacit knowledge as mentioned by Kivrak et al (2008) could be face-to-face interactions, coaching and mentoring, brainstorming, post project appraisals, meetings, e-mail, training, and communities of practice. As for explicit knowledge; it could be captured through documents, reports, standards, specifications, etc.

3.3.2.Storing knowledge

In order to transform the knowledge of an organization into its asset, the available knowledge should be stored in a proper way so that it can be retrieved and used in supporting the decision making processes of forthcoming projects. By this mean storing knowledge and forming an organizational memory is a crucial step in a knowledge management system. By storing the knowledge that has been captured today, different decision making situations of the future could be connected to today's experiences. Ozorhan et al (2005) argues that OM is a valuable asset and needs to be built and exploited in order to support reliable decisions at corporate level. They have generally state that an organizational memory is comprised of the knowledge from own experiences of the company (project memory and strategic decisions), the experiences of other companies, and the knowledge gathered from external sources.

As it has been said before; knowledge can only be stored (other than in human minds) in an explicit format therefore all of the acquirable tacit knowledge should be transformed into explicit knowledge if it is to be stored in an organizations memory (Ozorhon, et al., 2005). The process of storing knowledge should be in a way that it can be retrieved easily and efficiently. For this reason different structures and classification formats can be used which would place different knowledge under the theme-specific knowledge areas. Moreover there should be a

standard format with details that would depicture the situation that the knowledge has been generated, where it can be used and the conditions for reuse (Davenport, et al., 2000).

The content of a knowledge repository in a construction company can be; technical knowledge about construction methods, processes, and materials, it can be project information such as; unit costs, productivity, equipment or it can be strategic information, for instance; about subcontractors, performances of employee, competitors, market-country information and etc (Dikmen, et al., 2005).

It is seen that construction companies record the problems and their solutions faced in different project, they also keep records of regular meetings performed during the construction phase of a project. Moreover cost control records and bid proposals submitted to previous projects are recorded. In some companies the offer mentioned records are kept in a digital format. But when needed, there have been problems in finding the necessary documents since they haven't been systematically stored and not everyone knows where they exist. So it seems to be very time-consuming and confusing to retrieve the needed knowledge. A digital systematic format with an effective searching mechanism seems as a good solution for the problems mentioned in the knowledge storing process. Other examples for the tools used in accumulating and storing knowledge of construction organizations can be; Reports, the folders, computer files, personal archives, own head, minutes of meetings, video tape, internet, and emails (Kivrak, et al., 2008). Writing macro articles and constructing case bases are some other mechanisms suggested in the literature (Ozorhon, et al., 2005).

3.3.3.Knowledge shearing and Exploitation

Knowledge transfer is the application of the previously gained knowledge in maximizing the objectives of current projects. The gained knowledge can belong to different individuals and different time periods but the important thing is that it should be valid (Lin, 2008). The fruits of a good knowledge management system are harvested whenever the stored knowledge has been exploited in decision making process of the organization and moreover this knowledge has been shared to help organizational learning and increase the organization knowledge as an intellectual and intangible asset. However there is very little understanding of the best ways to nurture the

sharing of knowledge and less on ensuring that knowledge is easily available across the organization (Mohd Zin, et al., 2010).

The value of knowledge is generally realized when an organization has modified its behavior and performance in a way that it would reflect its new knowledge. This is achieved by shearing the knowledge among the individuals, project teams and organizations so that they can utilize it to support their decision making process. The valuable knowledge should be reused in order to revise the current work process and to increase the performance of an organization and add to its financial and intellectual capital in order to increase the overall market value of the organization. For this reason, there should be a learning mechanism that would support learning from the knowledge that has been managed in an organization.

critical strategic decisions such as; entering an international market, the selection of partners or other related parties, determining risk premium and price for tenders, restructuring the company (based on value chain analysis, and performance measurement, etc.), and Making new investments alongside Technical decisions are among some of the decisions made by construction companies. But due to the unique specifications of the construction industry (e.g. unique nature of each construction process, inherent uncertainties and incomplete scope definition) companies usually rely on experts judgments which should be supported by the knowledge available in their OM (Ozorhon, et al., 2005).

As an example for some of the knowledge shearing methods among the employees we can mention; team work, formal/regular meetings, informal/unplanned meetings, internal seminars and presentations, job rotation, brainstorming sessions, informal communication during social activities (Dikmen, et al., 2005). Also Kivrak et al (2008) have pointed out on-the-job training, intranet, meetings, face-to-face interactions, e-mail phone calls and teleconferencing, and informal chatting and storytelling as methods of sharing knowledge in construction companies. As for the dissemination mechanisms of knowledge in an organization we can point out; intranet, online access to data base, artificial intelligent-based decision support system (expert systems, case based reasoning, etc.), and web-based project management systems (Dikmen, et al., 2005)

It has been mentioned in the literature that an appropriate infrastructure in a firm is necessary to have a working and effective learning mechanisms. There should be a flexible, open and free

organizational structure, an organizational culture that supports learning, and finally an organizational learning strategy in the company. These factors are covered under the heading of "organizational setting" (Dikmen, et al., 2005) .

The culture of an organization is the result of its previous learning and experiences and it is related with the values, beliefs, common approaches, and solutions to problems. The learning process has to become a part of the organizational culture in order to reflect the benefits of knowledge in a firm's development and improvement. If a culture of an organization supports learning by training, rewarding, and encouraging individuals to shear their knowledge and new ideas, and also supports the organization in improving their level of its knowledge by learning from different sources of knowledge, then we can say that there is a learning culture in the organization (Dikmen, et al., 2005). It has been stated that culture is generally seen as the key barrier of effective knowledge sharing in an organization (Mezher, et al., 2005).

3.4.Knowledge classification

The recent advances in the semantic web provide opportunities for the construction industry to benefit from the intellectual knowledge management systems. Such systems offer more effective collaboration, where virtual teams of skilled users exchange ideas, best practice, decisions and so on. In order to achieve that, creating consistent semantic representation of knowledge is needed (El-Diraby, et al., 2005).

As one of the initial attempts for managing a concept, classification plays an important role in organizing and representing a domain. Classification as Kwasnik (1999) defines is: "the meaningful clustering of experience." Classification is one of the main processes involved in accumulating knowledge and shaping it into a powerful representation. According to Aristotle's philosophy the aim of science is to classify all phenomena by their true qualities. Classifications can be used as a rich representation of what is known and therefore be useful for connecting concepts (the things in the domain of interest) in a valuable structure. (Kwasnik, 1999) Hierarchies, trees, and paradigms are among the common structures for classification of knowledge. Based on Kwasnik's work; in the fallowing a brief explanation of these structures will be given.

Hierarchies: the understanding of hierarchy classification is inherited from Aristotle's hypothesize which states that all the nature is comprised of a unified whole which can be subdivided into "natural" classes and further on into subclasses and so on. This process contains a semantic and orderly set of rules regarding association and distinction. According to Aristotle, exhaustive observations can reveal each entity's essential attributes and with philosophy we can determine the necessary and sufficient attributes for membership in a given class. Based on Aristotle's philosophy, we can only say that we truly know an entity when we can properly classify and identify its essential belongings. Hierarchies are proffered knowledge representations in domains that have a theoretical foundation. The structural requirements for hierarchies are: inclusiveness, species/differentia (the generic relationship between super-class and sub-class), inheritance, transitivity, systematic and predictable rules for association and distinction, mutual exclusivity (a given entity can only belong to one class), and necessary & sufficient criteria (rules of inclusion to a class). However while hierarchies are desirable for their incorporation of knowledge about relationship, richness in description, and economy of notation, they include some problems such as:

- **Multiple hierarchy:** In the modern perspective of classification (opposite to Aristotle's philosophy) It is believed that there is no "one reality". It is believed that most phenomena have several separate sets of relationships and attributes which can overlap depending on the goal of representation.

- **Multiple and diverse criteria:** there is a practical limitation on the amount of information that a hierarchy can contain without being too complex. If a hierarchy structured based on too many perspectives and rules of grouping and differentiation, it will lose its power of clear representation.

- **Lack of complete and comprehensive knowledge:** hierarchies attempt to be comprehensive and to show the relations of all entities, therefore they require relatively complete knowledge about the domain in advance.

- **Difference of scale:** in order to maintain the principle of inheritance and transitivity, the entities in a hierarchy should be in the same conceptual level of granularity. Therefore differences in scale (definition) would cause the hierarchy to lose its integrity in knowledge representation.

- **Lack of transitivity:** the transitivity does not always satisfy the way people look at phenomena around us. In a hierarchy, somewhere in the chain of representation, rules can change and not all the attributes of the super-class can be invoked in determining the nature of sub-classes.

- **Rules of class inclusion are too strict:** some attributes may more or less confirm to the necessary-and-criterion of a class. From the other hand attributes in a class my share some attributes in common with each other but not all might share the same attributes. Finally an entity may belong to different classes under different circumstances. These types of problems arise from the fact that human beings do not perceive things in the same way.

As an example for using knowledge hierarchies we can mention Yan et al (2005) work. They have used a design knowledge hierarchy for their Quality Function Deployment (QFD)-enabled product conceptualization system. In their research they used the laddering technique in elicitation of the design knowledge. By using the design knowledge hierarchy, their system supports decisions on new product design specifications.

Trees: trees are a type of classification structure used to represent entities in a domain. Just like hierarchies, trees have class divisions and sub divisions but does not assume the rules of inheritance. This means entities can have partitive relations but do not have the generic (is-a) relationship. In knowledge representation, trees are used to show one particular relationship and the distribution of the entities with respect to that relationship. Trees have the fallowing formal requirements: complete and comprehensive information, systematic and predictable rules for distinction, and citation order. Using trees for representing knowledge brings up some problems which are: rigidity, one way flow of information, and selective perspective (emphasizing on one relationship masks other relations).

Paradigms: paradigms are a classificatory structure that entities are presented with the intersection of two attributes at a time forming a matrix. Paradigms can be used for comparison and to display of patterns and anomalies with respect to the variety and distribution of terms. Paradigms require knowledge of the domain so that you can make a good choice of dimensions. It should be considered that similar to most of classification structures, paradigms are usually biased and partial representations.

CHAPTER 4

RESEARCH BACKGROUND

In an attempt to identify, categories, and structure business development knowledge, this study has focused on developing a knowledge taxonomy for BD domain. In this regard, this chapter provides a background for the study and introduces the previous researches regarding developing knowledge taxonomy and classification.

4.1.Taxonomy in knowledge management

Taxonomy which is coined irregularly from “taxis” and “nomia” (that respectively mean arrangement and method) is known as a conceptual superclass-subclass hierarchy for categorization or classifications of entities in a domain. (Fidan, et al., 2011) These classification systems are structured in order to group things in respect to their similarities and have been used for a long time in biology in order to understand the natural world around us. El-Diraby (2005) states that; the main difference between a taxonomy and a classification system such as library classification or classification matrix is that “a taxonomy includes object-oriented features like encapsulation and inheritance and as such provides for reasoning and future expansions.”

In computer sciences, developing a taxonomy is considered as one of the stages in developing a knowledge ontology. This stage which includes knowledge elicitation and organization is known as “conceptualization” (Fidan, et al., 2011) (El-Gohary, et al., 2010). Taxonomies facilitate users to effectively find relevant information from a load of data through browsing and navigating information in a manageable space. Taxonomy is known as a hierarchical representation of categories which provides a navigation structure for exploring and understanding a specific corpus without struggling through a huge amount of documents and information (Chung, et al., 2002). Starting from a general topic inside the taxonomy, users can navigate to their desired topics in an appropriate way to find the information or expertise that they require. There are some advantages and disadvantages of using tree searching, but when combined with key-word searching, it offers a more efficient approach. As an additional benefit

for taxonomies within knowledge management, we can point out the issue that taxonomies provide a perspective on an organization or specific domain. In a semantic way, taxonomies break a domain or organization down to experts, skills, and so on which gives a general view about the interactions inside that domain.

So as a summary; there are two main applications for taxonomies in knowledge management; (1) providing an easily navigated structure for storing and reuse of knowledge (2) representing a taxonomic breakdown of the contents in an organization or domain (Hunter, 2012).

4.2.Constructing taxonomies

Proper Development of taxonomies needs a certain level of attention so that it could be inclusive and simple enough to fulfill the requirements and convenience of its users. A taxonomy is an appropriate breakdown which starts with a general category at the highest level and based on its application, it breaks down to more specific subcategories in lower levels. In general, developing a taxonomy includes varying degrees of judgment calls concerning classification and the balance between depth and coverage.

Some of the tools/best practices that have been used for this reason in the literature are: iterative development, involvement of domain experts in intensive interviews, and, the use of competency questions which are a set of constant questions that have to be considered to assure a consistent development of each concept/group of concepts (El-Diraby, et al., 2005). El-Gohary et al (2010) separates developing a taxonomy into two main steps which are; 1) extraction and identification of the main concepts in the domain and, 2) organization of these concepts into a hierarchical taxonomy.

In general, identifying and extracting of concepts in the domain are performed by overlooking and reviewing the available literature, documents, existing classes, etc in the domain. Interviewing experts can also help identify the contents of the taxonomy. As for structuring these concepts into model, Top-down and bottom-up approaches have been indicated as two approaches (Noy, et al., 2002). In a top-down approach the most general concepts are defined and then it is followed down to the most specific concepts. This approach may cause inclusion in abstractions of general concepts in the higher levels if it is solely used. Bottom-up approach is by defining the specific concepts and subsequently grouping them into general concepts. This

type of approach may cause the inclusion of unnecessary specific concepts if solely used. It has been recommended that a combination of these two approaches allows more flexibility in modeling and also prevents the two main problems which can occur if any of the approaches were applied solely. (El-Gohary, et al., 2010)

As an additional point of attention, the division of the categories should be consistent and in length with the expectation of the users, otherwise it is hard for users to navigate through it. Therefore; while constructing taxonomies sufficient attention should be given to its application and criteria. For example, if the criterion for dividing buildings is its application, the subcategories could be offices, apartments, commercial, etc, and when the criterion for splitting buildings is its structural system, the subcategories could be steel framed, concrete framed, masonry, etc.

Each of the subcategories should be a type or kind of their upper categories. This can be tested by asking the question of "what types of (upper categories) are there?". The items in the subcategory should be an appropriate answer to this question (competency questions). For example a steel framed building is a type of building. Moreover while splitting the categories inside a taxonomy, we should consider that each set needs to be split into disjoint sets otherwise there can be confusions in deciding which branch to take. In order to test this characteristic of a taxonomy, we can ask "could one category be a type of other category" if the answer is "yes" then we have coinciding problem. As an example "is braced frame type of steel frame?" since the answer is "yes", therefore braced frame and steel frame should not be used in the same level of the taxonomy. However, in some cases it is needed to ignore this condition and allow some elements to appear in various branches. An extra consideration is also needed when choosing terms for categories. The name selected for a category should be in a way that there is the highest possible degree of resemblance between members of the category. The category should illustrate all the attributes that one would expect of its members.

Many authors have used taxonomies in order to represent knowledge. In the following we will point to some of them.

4.3.Previous studies on knowledge taxonomies

With the increase in usage of semantic web and knowledge management in construction industry, researchers have focused on developing structures for representing knowledge or developing ontology according to their needs.

In their research, Fidan et al (2011) designed a taxonomy for developing an ontology in favor of relating risk and vulnerability to Cost Overrun in International Projects. This ontology is used to develop a database system that represents risk event histories (lessons learned) of international construction projects and to construct a model for estimation of cost overrun.

In an attempt to develop an ontology for construction knowledge, El-Diraby et al (2005) have presented a domain taxonomy for construction concepts. The motivation behind their work was to create consistent semantic representation of construction knowledge to support the system where virtual teams of skilled users, can exchange ideas, decisions, and best practices. Their proposed taxonomy has the specification of targeting the whole construction domain. The presented taxonomy has seven major domains of: Process, Product, Project, Actor, Resource, Technical Topics, and Systems.

El-Gohary et al (2010) have developed a taxonomy to construct an ontology for the infrastructure and construction domain. The ontology is used for developing a knowledge model that describes the multistakeholder project development process which supports knowledge-enabled process management. Five main concepts have been used in the taxonomy to represent the domain: entity, constraint, attribute, modality, and family.

Considering the lack of a coherent performance condition in business environment due to its high dependency on individuals, Experience and Knowledge is considered as the main characteristics required for business development management. But to my knowledge there is no research available on developing a classification or taxonomy for systematically capturing and storing the knowledge available in business development management of construction companies.

As a usual manner in construction organizations, business developers are selected among the ones who have a higher experience in the industry and have understood the relations governing

in the business environment. The valuable knowledge of business developers supporting their attitude in the way they approach different business conditions, and also their performance in managing the interactions with other people in the business environment is among the most important assets of a company. Therefore because of the vital importance of BD for an organization, this knowledge should be highly appreciated, captured and managed in order to become a firm's asset in providing a competitive edge for the company.

In this regard, this thesis has focused on developing a knowledge taxonomy for business development management in a construction company. The offered taxonomy is believed to be used for representing, storing, sharing, retrieving and in general, managing knowledge related to BDM of an organization. More over the taxonomy can provide an appropriate outline for capturing BD knowledge or information available in the organization to form a knowledge base that supports SWOT analysis of business developers before making business decisions. These decisions can be: entering new markets, finding new clients, undergoing new projects etc. in addition, Considering the low amount of literature focusing on different aspects of BDM, it is believed that this work can provide a good understanding on the semantic nature of business development management in construction companies.

CHAPTER 5

RESEARCH METHODOLOGY

This chapter focuses on introducing the data collection and research process performed in order to reach the initial targeted results in the scope of the study.

Reviewing the literature on KM and BD revealed that up to this day, no research to be aware of has been conducted in order to present a comprehensive structure for representing, storing, sharing, retrieving and in general, managing knowledge related to business development management of an organization. Considering the fact that BD activities in construction companies are experience intensive and that the performance of business development is highly dependent on the personnel's skills, knowledge and creativity through business interactions, it is believed that managing this knowledge (specially the tacit knowledge) has a vital level of importance in order to sustain the development performance of an organization. The main theory behind this research is "knowledge is a valuable asset for an organization and a convenient management of this knowledge would increase the performance of the organization". Therefore Based on a literature review; a gap of KM in business development was realized that urged this thesis study to focus on developing a knowledge taxonomy for business development management in construction companies. As an additional contribution to science, this study has offered a fundamental conceptualization of BDM knowledge by providing a comprehensive semantic representation of the BDM domain which can guide scholars and business developers in understanding the perspective of it.

5.1.Data collection

In order to identify the concepts of the domain knowledge, a literature-based review and brainstorming sessions was conducted. For this reason with the use of "Google scholar" as a search engine, the available sources such as journal articles, books, academic documents, thesis, and web pages in the field of business development were identified and reviewed. Based on the findings an initial list of knowledge concepts was prepared. It has been believed that Business

development is the act of researching and identifying available and potential types of business in the existing markets in order to create novel revenues by attracting new clients and maintaining the existing ones for long and short term profits. Business development is the main unit which guides a company in order to expand its business in a specific sector or more importantly to survive in the competitive market. According to the initial literature survey, it was seen that the critical knowledge for BD circulates around three main categories which are: own company, host country, and clients. Table 5.1 demonstrates the initial list of knowledge concepts that has been identified.

Because of the shortage on related literature in the concentrated domain, the initial list was believed not to be reliable, therefore an additional data collection of the main subjects available and also a validation of the early concept list was seen necessary. For these reasons; despite the short comings such as cost and time ineffectiveness, semi-structured interview with business development professionals was decided to be used. This qualitative method was preferred for couple of reasons; first, because there were no similar work identified on this specific topic, thus it was difficult to specifically consider a primary possible structure for the research to be investigated. In semi-structured interview's, depending on their experience in BD, the interviewees can freely express their ideas and by that, a good and deep understanding of the domain could be achieved. Second, as it has been stated in previous chapters, one of the common practices for capturing knowledge is through socialization and narratives, therefore an interview based method could give a good understanding about capturing tacit knowledge in construction industry. Finally; it is believed that the issue of implementing knowledge management in Turkish construction companies is a new subject and professionals my not have enough dominance on the subject; therefore comprehension problems could have been experienced in other methods such as questioner surveys. Semi-structured interview's gives us the chance to be sure that the questions have been fully understood. In the following a detailed explanation on the conducted interviews will be presented.

Table 5. 1 Knowledge concepts gathered from literature review

Concepts of knowledge for host country
Host Country Political Structure
Host Country Foreign Policy
Host Country Economic structure
Host Country Financial Indexes of last 5 years
Host Country Social Structure
Host Country Social Disorders
Host Country General geography condition
Regional geography condition
Host Country Legal Structure
Host Country Market Structure
Host Country Infrastructure condition
Host Country Constructional resources condition
Host Country Non constructional resources condition
Host Country construction Market Business Regulations
Competitors General Information
Competitors Business Information
Company Competitive Advantages in that specific market
Market Demand
Occurred changes in the market and there causes
Possible Future Changes in the market Caused by Current Conditions
Advertisement Methodology
Market Connections

Table 5. 1 Knowledge concepts gathered from literature review (continued)

Type of data/knowledge for client
Client Profile
Client Management Personality
Client Customer Relations
Client Business Strategy (administrative)
Client Preferences and Expectation
Client Financial Condition
Occurred changes for the Client and there causes
Possible Future Changes for the Client Caused by Current Conditions
Clients available projects
Client Future Demands
Client communication

Table 5. 1 Knowledge concepts gathered from literature review (continued)

Type of data/knowledge for own company
Company Registry Information
Company Business Status
Company Organization data
Company Resources
Partners (JV/Consortium) info
Suppliers and Subcontractors info
Designer info
Consultant info
Innovations
Previous Projects
Technical Development
Resources Development
Managerial Development
Business Development staff
Business targets
Business development Strategies and tactics
Performance evaluation

After acquiring the necessary feedbacks from industry experts, the required modifications were made on the initial list and it was finalized. Later in order to organize the acquired pieces of knowledge, a taxonomy was developed. The taxonomy was designed in a way that it would cover all of the findings achieved from industry experts in a conceptual hierarchy.

As a common shortcoming of qualitative researches, the results of a semi-structured interview has the problem of being observer dependent which causes the results obtained to be influenced by the investigator's understanding on the respondents' discussions and this raises questions of validity. For that reason the taxonomy's dependability was validated by interactive workshops with three domain scholars and a navigation test in order to verify the ability to locate concepts inside the taxonomy. The mentioned tools have been adopted from a similar work by El-Diraby et al (2005). Finally a case study has been conducted in order to test the taxonomy in real life conditions. In this case study, oral history interview was used to interview an expert en route for capturing his knowledge on business development issues. It was seen that the captured knowledge could be navigated and placed under the appropriate category inside the taxonomy. A much detailed explanation about the validation will be given in the upcoming sections.

As a final task in this research; in the sense of demonstrating the benefits of the offered structure, a software was designed to display the usage of the developed taxonomy in knowledge management systems.

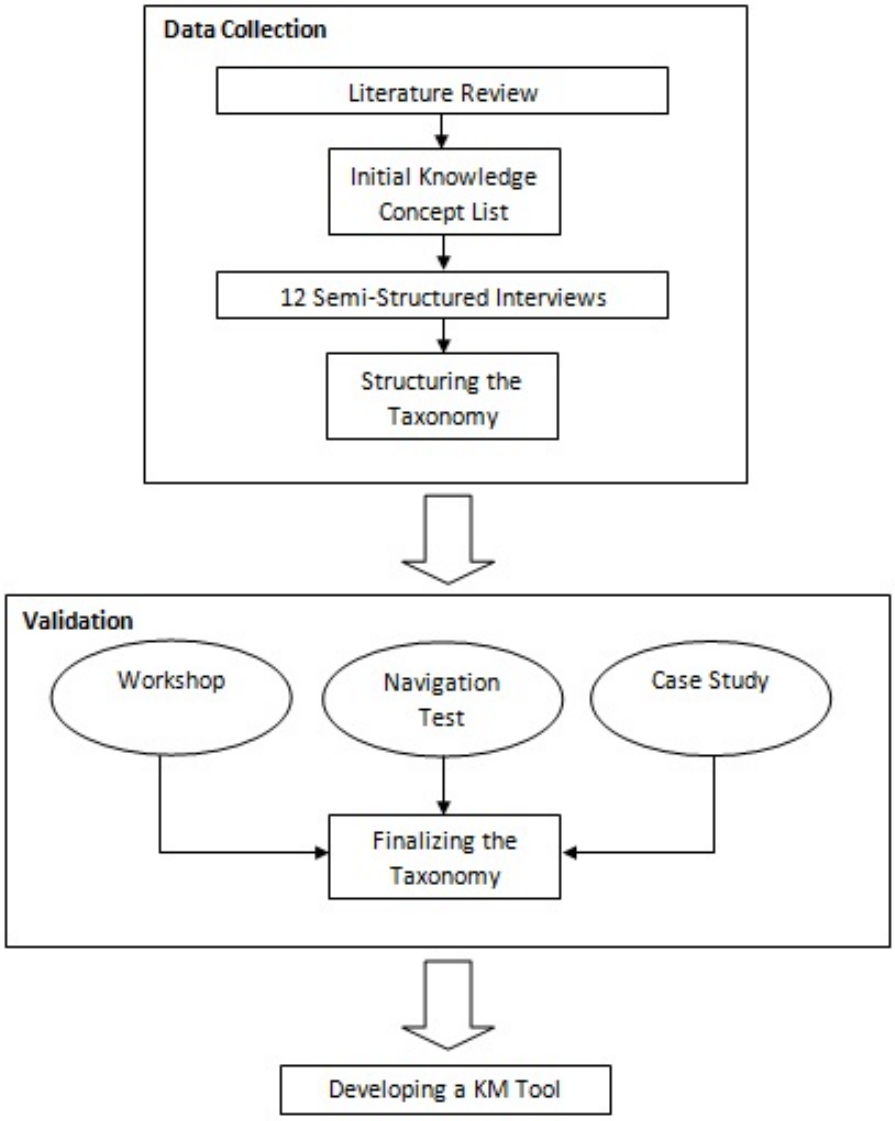

Figure 5. 1 Research process plan

5.2.Specification of the interviews

Semi-structured interviews were carried out with company professionals to highlight the main knowledge concepts of business development in construction industry. A variety of small, medium and large size Turkish contractors active in global markets such as: Middle East, CIS, Europe, and Africa were selected as the target population. Selected experts from this population with 18 years of professional experience in average were interviewed. Interview request were sent to 14 of these companies which 11 kindly accepted to participate in the study. The interviews were performed face-to-face with the respondents at the managerial level and the company representatives were business development managers, country managers, project managers, and deputy general directors who were firmly familiar with the company's business development practices. Eleven construction companies participated in the study, all of which are members of the Turkish Contractors Association (TCA). For ten of these companies only one response was received, but for the remaining company, two experts were interviewed which resulted in an overall number of 12 responses for the study. Each interview lasted about 1.5 hours and they were conducted by the present author. One of the interviews was conducted with three professionals in a focus group form but in order to give uniformity to the data collection process, the response was considered as an individual response, similar to other responses.

Nine of the participant companies were listed in ENR's Top 225 International Contractors list for 2011. The selected companies are active in such fields as: building, Transformation, infrastructure, industrial structures, and energy and according to their own response they believe that they are highly active in business development management. Table 5.2 shows some of the company information to give a general idea about their profile. For confidential reasons, names of companies and experts are withheld. It should be pointed out that it was really difficult to reach people in the market and to ask them to dedicate their time for this research.

Table 5. 2 Company specifications of the interviewees

		Average Annual Turnover (US$ million)		
Company	**Age**	**Domestic**	**Overseas**	**Number of Employees**
1	46	350	650	500<
2	38	70	20	500<
3	49	186	530	500<
4	50	0	700	500<
5	13	0	11.5	<100
6	20	0	1000	500<
7	25	65	135	500<
8	53	143	1160	500<
9	85	0	3100	500<
10	30	160	20	500<
11	9	0	100	100-150

5.3.Interview Plan

After presenting the main idea behind the research and explaining its contents, the interviewees were asked to give general information about themselves and their company. This part was for the evaluation of the interviewee in respect of business development experience and performance. Moreover knowing the background of an interviewee and their company performance can help interpret his or her answers. Later the respondents were asked about the concepts of knowledge and information that are crucial for them in their profession, and whether they believe that acquiring knowledge is important in business development or not, if it is, do they have any knowledge base that they keep the acquired knowledge. Afterward it was asked that based on their experience, what concepts of knowledge they believe is necessary for BDM. Finally the professionals were handed a list of identified concepts of knowledge that had been prospered based on literature review and asked to rate the concepts on their level of criticality for business development management.

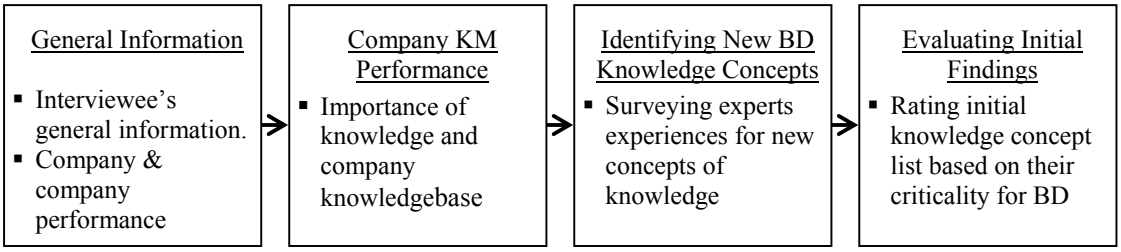

Figure 5. 1 Interview plan

The major strategy behind the plan of the interviews as shown in Figure 5.1, was to get as much as knowledge fields as possible from the respondents without affecting their possible answers with the initially identified knowledge concept list, this way we could identify the concepts that have been missed from the initial list. A copy of the interview questions is presented in Appendix A.

5.4.Developing taxonomy for business development

By considering the wide range and varieties of knowledge surrounding a specific activity, setting up a knowledge management system across an organization could be a challenging process. The attempt to organize different types of knowledge inside a specific domain demands structuring them in a convenient system. In turn, this calls for an extensive meta-knowledge to guide us in managing the related knowledge with respect to specific activities. Thus taxonomies are considered as a simple and effective approach for compensating this need of meta-knowledge.

In favor of developing a taxonomy for business development an ontology construction framework was over viewed. The method which is known as "Methontology" is one of the inclusive frameworks available. Methontology includes series of activities which the main ones are: Specification, conceptualization, formalization, implementation, and evaluation.

Specification; that is the determination of the scope and the goal of developing the ontology, conceptualization is the collection and organization of the related domain concepts to be included in the ontology, formalization is the formal representation of knowledge, implementation is known as converting the formalized knowledge into a machine-processable language, and evaluation is validating the completeness and the generality of the ontology.

(Fernandéz-Lopéz, et al., 1997) Of course the scope of this research is not to construct an ontology, but considering taxonomies as one of the stages of developing a taxonomy, some of the steps mentioned above can be applied in this study. Ontology is considered as the study of the nature of a being or reality including the basic categories and their relations, therefore a taxonomy could be considered as an ontology excluding the logic relations between the categories.

This study includes the stages of specification, conceptualization, and evaluation of an ontology development process and is resulted in a comprehensive taxonomy for business development management in construction companies. A detailed explanation of the different stages is given in the next chapter.

5.5.Validation of the framework (Taxonomy)

As a main deficiency of qualitative research methods, we can point out the high dependency on individuals. Findings of a qualitative research are highly influenced by the respondent's understandings of the issue, their experiences and emotional condition. In addition to these, the perception of the researcher from the responses has a high affect on the findings. Although the number and the specifications of the respondents has a considerable effect on the accuracy of the results, but still this type of research calls for validation necessities.

In this research, three tools were used for validating the taxonomy. The first tool was interactive workshops with three domain scholars who have a rich academic resume in related topics. This included full presentation of the taxonomy, application, and a detailed examination of the concepts included, as well as clustering patterns. Throughout this section, the dependability and apprehensibility of the taxonomy was questioned.

The second tool was a questioner survey with 2 domain experts to assure the external validity (applicability, and ease of use) of the proposed taxonomy. The experts were knowledgeable in construction management, design, project finance and all of whom have office and field experience. The survey included 53 pieces of hypothetical knowledge which were asked to be navigated and placed under the appropriate category inside the taxonomy. The aim of this test

was to control the layering condition of the taxonomy and the feasibility to process through these layers to find the designated location of knowledge.

As a final tool for validating the taxonomy a case study has been conducted in order to test the capability of the taxonomy in managing the tacit knowledge in real life cases. Case studies have been recommended when ever in-depth and comprehensive investigation is needed (Feagin, et al., 1991). after all, the findings of a research are valuable when they can be applied to real life events in the industry. Therefore the case study was an attempt to illustrating how the taxonomy can provide a useful framework for managing business development knowledge in construction firms. In this regard, oral history interview method was used to conduct an interview with a highly experienced expert in business development. Oral history is defined as; "by means of life histories or personal recollection where informants speak about their own experience" (Henige, 1982) and it is a method for grasping the knowledge that exists only in people's memories. The interview lasted for approximately 2 hours and the expert was asked to present some of his valuable and useful knowledge that he gained during his long period of activity in different construction markets. The historical events from real cases were recalled and by verbal analyze of his statements, lessons learned were identified and recorded. Later the developed taxonomy was used to tag the captured pieces of knowledge. By the means of this tool the applicability of the taxonomy was tested in real life condition of the construction industry.

CHAPTER 6

RESEARCH FINDINGS

In the current chapter different stages of the study will be mentioned and results will be discussed. This chapter is comprised of the general findings about knowledge management and business development in Turkish construction industry. Moreover it contains the different stages mentioned in the methodology that have been accomplished in order to develop a comprehensive knowledge taxonomy for business development of Turkish construction.

6.1.General findings

Throughout this research some general insights about the topic of the study in Turkish construction was achieved. For instance it was seen that, unfortunately the Turkish construction experts haven't totally perceived the meaning of knowledge and often confuse it with data or information. A similar problem was seen with knowledge management, its objectives and benefits as a managerial responsibility. It seemed that KM wasn't seen as a systematic process and organizational act, but instead it was more often implemented based on socialization and the human nature willing to improve and develop themselves in their job position for better work conditions. By considering the discussions available on the pure definition of knowledge among different scholars and the novelty of knowledge management in Turkish construction organizations, this was somehow expected. Previous works (Kivrak, et al., 2008) (Ozorhon, et al., 2005) on Turkish construction also support these facts. Based on his research about Turkish construction companies, Kivrak et al (2008) has found that; the most important knowledge sources for the firms are colleagues and company's experience. In their research, company experience is denoted as the knowledge that is not documented but it is believed to exist within the company. Moreover, they have revealed that difficulties in finding relevant knowledge whenever required, is the main reason for not reusing stored knowledge. It has been said that for emergency cases companies prefer the traditional method of referring to experts and engineers.

As a result, it seems that having an efficient structure for storing and retrieving knowledge could be very useful for this industry and this authenticates the importance of this study.

Across this study, the respondents were asked to rate the importance of knowledge for BD purposes. It was encouraging to see that 8 of the respondents considered knowledge acquisition at a very high level of importance while the rest of them believed that the level of importance is high. The respondents believed that personal skills and experience along with appropriate knowledge was the key factors for a successful business development performance. Moreover, respondents were asked whether they had any specific software or system for storing and sharing necessary knowledge inside the organization. It was revealed that only three of the companies use ERP for knowledge management purposes in there company and the rest just use general software such as MS-office applications and emails but they have plans to move to ERP systems too. It was interesting to know that in the companies which use ERP systems for knowledge management purposes have problems updating and organizing the information in a usable manner. In some way this observations reveal the need for knowledge managers and development of cultural bases for KM in organizations.

In order to see what pieces of BD knowledge is considered to be valuable for the company, we asked the respondents to list the pieces of knowledge that are stored and documented in their company, Table 6.1 shows the responses received. In general, the main pieces of knowledge kept by business developers were information about; host country (political, economical, geographical, and needs), market knowledge (cost resources, regulations, competitors), and related parties (partners, sub contractors, and suppliers).

Table 6. 1 Pieces of knowledge stored in interviewed companies

Company	Pieces of knowledge stored in the company
1	Country knowledge, knowledge about (partners, competitors, economic situation, legal agencies, political condition, competitive advantages & disadvantages)
2	Country reports (from in-house and consultant companies), BOQ of previous tenders, Technical data for some specific projects, Contact info.
3	Country Knowledge (political, financial, competition, future projects), Partners and Sub-contractor info)
4	Client profile, Contact info

Table 6. 1 Pieces of knowledge stored in interviewed companies (Continued)

Company	Pieces of knowledge stored in the company
5	Information about current and potential client (technical condition, key personnel, needs, customer relations), Local partners, Own company available and upcoming projects, facility and Infrastructure, Venders, Suppliers and Sub-contractors, Country risks(political, economic and social),business development records
6	Country knowledge (GDP, GDP/ per-capita, recourses, needs, political stability and figures, Economical and financial figures) Client knowledge (needs, budget for construction, competitors, price level) Market data [resources (HR, material, Equipment) availability and cost], Local contractors, Contact info, Geography condition, Competitors data, History of past tenders, Partners.
7	Market connections
8	Country information,(financial statues, political condition, climate, calendar, market regulations) Client info (advance payment, prequalification condition, name, name of project, country, deadline of applications, financial agencies, previous works, project size) Partners, Suppliers
9	Country information, Market Analysis Reports, Company Prices for different projects, Competitors advantages and disadvantages, Competitors prices, Clients attitudes, Minuets of Meetings with the clients.
10	Contact info (business cards, reports), Infrastructure, Costs, client (contact persons, business opportunity, how to corporate with them in the future), Company qualification documents, Company agreements with clients and suppliers, Minutes of meetings, Project reports, Relevant standards, Market analyze of global transmission report web site (about available projects and markets), Trip reports, Client orders, Pictures, Customer work completion letters.
11	1) We keep and follow political contact people 2) The natural resources of the country (to identify investment opportunities and business fields) 3) Industry needs of the market (medical, petroleum,..) 4) Potential privet investors and their representation in different markets (fallow there interest in different markets) 5) Government (home and foreign) relations with each other and with different investors 6) Need and demand of country and clients 7) Financial institutions (IMF, world bank, …) (credits that they provide and their interest in types of investments) Potential demand and lack of supply in the country Investors (Potential Clients) in the above sector Financial Institutions, which can provide credit lines (IFC, World Bank etc.) Political Risks in the subject country Possible Threats in the subject company

Reports have been seen to be the common format for storing knowledge in construction companies. This issue has also been mentioned by Kivrak et al(2008). Country reports are one of the widely used types of reports for BD in construction companies which contain considerable amount of valuable information and knowledge. These reports contain materials such as: general information about the country (major cities, weather condition, accommodation, etc), market information (regulations, potential projects, allies and competitors) contact info, reports of meetings with potential clients and partners, report on accomplished missions, information about other possible markets, etc.

As a final word for our general findings we can say; it seemed that the responsibilities and objectives of business development managers in Turkish companies correspond in general, but depending on top management preferences, this duty can differ from one company to another.

6.2.Developing a knowledge taxonomy

As mentioned in the methodology of the research, different steps of methontology have been used as the process for developing the taxonomy. This process is comprised of "specifications", "conceptualization", and "evaluation". In the fallowing the process through developing the taxonomy is explained in details.

6.4.1.Specification

In the process of developing an ontology, specification is considered as determining the scope and the purposes of the ontology. Specification can be obtained by answering the question "why this ontology is being built and what are its intended uses and end-users?" (Fernandéz-Lopéz, et al., 1997) (Breitman, et al., 2007). Hence for developing a taxonomy we can modify the question to: "why this taxonomy is being built and what are its intended uses and end-users?"

The main reason of taxonomy development in this study is to build up a framework for managing business development knowledge in construction sector. BD is considered as a highly human related activity, and it is the experience and skills of a business developer that plays the main role in their performance. It was recognized that although it is believed by the experts that; business development is an individual-related activity and you cannot separate the decision making capability of a business developer from him/her, but it can be seen that there is a

considerable amount of tacit knowledge inside the domain which can be codified and benefited (apart from the individual that holds it) in solving problems and decision-making processes. Therefore a need of a structure for capturing, storing, and exploitation of BD knowledge was needed. More over during the literature review a gap of a plenary work about BD knowledge in construction sector could be recognized. It is seen that this specific domain has not been regarded by a large number of researchers; therefore developing a taxonomy can provide an understanding over its reality, this in its turn can provide a suitable base for further research in respect of business development in construction companies.

6.4.2.Conceptualization

Conceptualization is the activity related with collection and organization of the relevant domain concepts to be included in the taxonomy. Conceptualization indicates a simplified perspective of the world (Fidan, et al., 2011). This stage consists of knowledge elicitation and structuring an organization for the acquired data.

Knowledge Elicitation

As mentioned in chapter 4, after a detailed literature review as well as undertaking interviews with domain experts a list of knowledge concepts to be involved in the taxonomy was prepared. This process forms the knowledge elicitation stage of conceptualization. The initial list consisted of 50 concepts, and relevant experts were asked to rate these concepts in regard of their criticality to business development in construction industry. It was seen that BD experts find all the identified knowledge concepts critical to medium except for advertisement methodologies. A summary of the given responses is given in Table 6.2. Considering the percentage given for the criticality of ‘advertisement methodology’, it is believed that the results received for this category could need deeper investigation in future researches.

Table 6. 2 Responses of industry experts regarding the level of criticality for each knowledge piece

Type of data/knowledge for client	Critical	Medium	Uncritical
Client Profile	90.91%	9.09%	0.00%
Client Management Personality	45.45%	45.45%	9.09%
Client Customer Relations	81.82%	9.09%	9.09%
Client Business Strategy (administrative)	72.73%	27.27%	0.00%
Client Preferences and Expectation	100.00%	0.00%	0.00%
Client Financial Condition	90.91%	9.09%	0.00%
Occurred changes for the Client and there causes	63.64%	36.36%	0.00%
Possible Future Changes for the Client Caused by Current Conditions	72.73%	18.18%	9.09%
Clients available projects	100.00%	0.00%	0.00%
Client Future Demands	90.91%	9.09%	0.00%
Client communication	81.82%	18.18%	0.00%
Company Registry Information	81.82%	18.18%	0.00%
Company Business Status	81.82%	18.18%	0.00%
Company Organization data	63.64%	36.36%	0.00%
Company Resources	90.91%	9.09%	0.00%
Partners (JV/Consortium) info	90.91%	0.00%	9.09%
Suppliers and Subcontractors info	54.55%	45.45%	0.00%
Designer info	63.64%	36.36%	0.00%
Consultant info	54.55%	45.45%	0.00%
Innovations	63.64%	36.36%	0.00%
Previous Projects	90.91%	9.09%	0.00%
Technical Development	81.82%	18.18%	0.00%

Table 6. 2 Responses of industry experts regarding the level of criticality for each knowledge piece (continued)

Type of data/knowledge for client	Critical	Medium	Uncritical
Resources Development	63.64%	36.36%	0.00%
Managerial Development	63.64%	27.27%	9.09%
Business Development staff	72.73%	18.18%	9.09%
Business targets	90.91%	0.00%	9.09%
Business development Strategies and tactics	81.82%	18.18%	0.00%
Performance evaluation	72.73%	18.18%	9.09%
Company Registry Information	81.82%	18.18%	0.00%
Company Business Status	81.82%	18.18%	0.00%
Company Organization data	63.64%	36.36%	0.00%
Company Resources	90.91%	9.09%	0.00%
Partners (JV/Consortium) info	90.91%	0.00%	9.09%
Suppliers and Subcontractors info	54.55%	45.45%	0.00%
Designer info	63.64%	36.36%	0.00%
Consultant info	54.55%	45.45%	0.00%
Innovations	63.64%	36.36%	0.00%
Previous Projects	90.91%	9.09%	0.00%
Technical Development	81.82%	18.18%	0.00%
Resources Development	63.64%	36.36%	0.00%
Managerial Development	63.64%	27.27%	9.09%
Business Development staff	72.73%	18.18%	9.09%
Business targets	90.91%	0.00%	9.09%
Business development Strategies and tactics	81.82%	18.18%	0.00%

Table 6. 2 Responses of industry experts regarding the level of criticality for each knowledge piece (continued)

Type of data/knowledge for client	Critical	Medium	Uncritical
Performance evaluation	72.73%	18.18%	9.09%

In the light of experts suggestions in the interviews and brain storming sessions; the list was modified and the final list consisted of 52 concepts as shown in Table 6.3. The modifications were consisted of renaming (client performances and expectations into client contracting condition), splitting, and merging (host country regional and general geography condition into geography condition) of different categories in order to increase the taxonomies usability and understandability. Some further categories such as "Natural Resources" were suggested by experts and have been added. In addition; in some cases, concepts such as "advertisement methodology" which unexpectedly was considered as non-critical knowledge have been deleted from the final list. It is believed that the category should be investigated deeper because such advertising activities such as catalogs, exhibitions, seminars, etc. are recognized in company activities. This opinion about advertisement methodology could be because these activities are related to such units other than BD. The categories related to changes and their causes were also removed due to the fact that changes are sources for lessons learned and it can be related to any of the categories identified, therefore having a separate category didn't seem necessary.

Table 6. 3 Final list of knowledge concepts for BDM of construction companies

No.	Concepts of knowledge Necessary for Business Development	Related Subjects
1	Host Country Government	Government type (Regime), Government organizational structure, Executive branch, History of the country and independency, Political parties, Bureaucratic system, Government stability, Political corruption, Constitution, Domestic policies
2	Host Country International Relations	Political relations with other countries, Trade and economical relations with other countries, Alliances, Global image, protectionism, International trade agreements
3	Host Country Strategic Plans	Fields of investment, Allocated budget, Development plan & schedule, Foreign investment Policies, Investment incentives
4	Host Country Economical Structure	Budget and revenues, Industries, International trade (Import & Export), Currency, Financial and funding resources, Country expenditures,
5	Host Country Financial Indexes	Economic growth rate, GDP, Inflation and defilation rate, Currency exchange rate, Interest rate, Current account balances, Financial reserves (Foreign currency, Gold)
6	Host Country Socio-Cultural Structure	Population structure & Distribution, Linguistic communications, Religious believes, Ethnic groups, Ethics & Traditions, Literacy, Welfare, Human rights & Women rights conditions, Social security, Time & Calendar, Art & Music, Clothing
7	Host Country Social Disorders	Ethnic Tensions, Public reaction, Riots, Strikes, Civil wars, Rebellion, Terrorism, Racism, Hostage, Social and religious conflicts, Class discrimination, Mafia powers, Robbery, Infectious diseases, Traffic condition, Illegal Drug existence, Gender inequality
8	Host Country Judiciary System	Legal system, Judicial Law, consistency in the law, Courts & Judges, Justice implementation
9	Host Country Judiciary Conditions for Foreigners	Legal system condition for foreigners, Judicial Law condition and exceptions for foreigners, Foreigners trial process, Enforceability of law by foreigners
10	Host Country Geography Condition	Location, Climate, Terrain & Topography, Natural hazards, Pollution
11	Host Country Natural Resources	Petroleum, Minerals, Fertile soil, Jungles, Coast lines, Rivers

Table 6. 3 Final list of knowledge concepts for BDM of construction companies (Continued)

No.	Concepts of knowledge Necessary for Business Development	Related Subjects
12	Host Country Infrastructure	Costs, Availability, Procurement, Productivity, Quality [Electricity, Telephone, Cell phones, Water distribution network, Gas, Post, Internet, Broadcast & Media, Sewage, International and Domestic transportation]
13	Host Country Servicing Organizations	Costs, Availability, Productivity, Quality, administrative systems of [Insurance, Banks, Financial organizations, Trade unions, Engineering chambers and societies, Labor unions, International organizations (UN, red cross, human rights, Interpol,…), fire fighting department, Logistics, Medical services, Supermarket chains, international food chain,...], Embassies, Freight services
14	Host Country Market General Specifications	Market size, Market growth rate, attitude and trends of the market (like seasonal attitude and …), Risk Level, Image of the market
15	Market Demand	Product & Service, Current and future demands
16	Host Country Construction Market Trade Regulations	Taxation, Depreciation, Auditing and accounting system, Insurance regulations, Custom regulations, Import-export conditions, licenses and permits, Labor rights & industrial relations, General Conditions of Contracts, Employment regulations, international trade regulations applied in the market
17	Host Country Market Regulations for Foreigners	Work permit for foreigners, Residence-Visa conditions, licenses and permits, Domestic partner or sponsor requirement, Employment regulations, Money transferring system, Foreign property ownership, Equipment and machinery transition to the country
18	Host Country construction Market Standards	Quality, management, Design codes, H&S, Environmental
19	Competitors	Competitors profile, Strategic plans, Previous projects in the market, Business status, Business relations, Business development performance, Market image, Biding tactics, Financial status, Competitive advantages & disadvantages, Market share, Company organizational structure, Complains about their performance.

Table 6. 3 Final list of knowledge concepts for BDM of construction companies (Continued)

No.	Concepts of knowledge Necessary for Business Development	Related Subjects
20	Own Company Competitive Conditions	Competitive advantages and disadvantages in the market (Product & services, Technical qualifications, Managerial qualifications, Equipment and Machinery, Cost advantages, Human resources, Relations, Distance to home country, Financial sponsors, Government support & incentives, Market image)
21	Host Country Human Resources Condition	Costs, Availability, Procurement, Productivity, Quality
22	Host Country Construction Material Condition	Costs, Availability, Procurement, Quality
23	Host Country Financial Resources Condition	Type, Availability, beneficiary conditions, administrative procedures
24	Host Country Equipment & Machinery Condition	Costs, Availability, Procurement, Productivity, Quality
25	Market Contact Info	Who knows What, Communication management, Market connections, Contact personals characteristics, Contact Information (competitors, Embassies, governmental offices, consultants, Fellow companies and Own land companies etc.)
26	Client Profile	Registry Information, Key Personnel, Business history, Market image, Certificates & Memberships, Original country
27	Client Management Characteristics	Level of professionalism in business, Project management experience and professionalism, Technical experience and professionalism, Administrative and bureaucratic system, Attitude and ethics (Loyalty, Enforceability of contracts, Level of compliance to international agreements, Level of transparency in business, Level of certainty in decisions and demands, Level of commitment to agreements, Decision making duration, Cooperativeness, Coordinating skills of different parties, Level of Adherence to documentations etc),
28	Client Management Cultural Conditions	Linguistic issues, religious issues, Ethnic issues, Traditions, Cultural Values
29	Client Management Business Relations	Relations with government departments, Customer relations, Relationship management, Relations with Contractors

Table 6. 3 Final list of knowledge concepts for BDM of construction companies (Continued)

No.	Concepts of knowledge Necessary for Business Development	Related Subjects
30	Client Strategic Business Plans	Technical development plans, Managerial development plans, Market extension, New investment plans,
31	Client Financial Condition	Yearly revenue, Net profit, Share price, Dividend policy, Construction budget, Financial structure, Financial stability, Working capital, Current and fixed assets, Liquidity statues, Financial resources, Contingency resources,
32	Contractor Selection	Tendering process , Negotiation process, Technical requirements, Quality requirements, Project management requirements, Financial preferences, H&S and environmental preferences, Certificates
33	Client Contract Conditions	Payment system, Contract Conditions (warranties, Certificates, advance payments, amount of retention, Warranty period, time extension, claim system …), PDS
34	Clients Demand	Product & Service, Current and future demands, projects in the pipeline
35	Client Contact Info	Who knows what, Contact Links, Contact information, Information flow Process, Communication management, Contact personals characteristics
36	(Partners, Local Partners, Designers, Consultants, suppliers and Subcontractors) Profile	Registry information, Business History, Key personnel, Memberships & Certificates, Original country, Market image
37	(Partners, Local Partners, Designers, Consultants, suppliers and Subcontractors) Management	Level of professionalism in business, Attributes and ethics (Enforceability of construction contracts, Level of compliance to international agreements, responsiveness, Level of transparency in business, level of Adherence to documentations, Level of certainty in decisions and demands, Level of commitment to agreements, Decision making duration, Reputation, Cooperativeness, Coordinating skills of different parties, Information flow duration, etc), Cultural conditions, bureaucratic system, Relationship management & Business Relations
38	(Partners, Local Partners, Designers, Consultants, suppliers and Subcontractors) Business Conditions	Financial status, Financial stability, Strategic plans, Current works

Table 6. 3 Final list of knowledge concepts for BDM of construction companies (Continued)

No.	Concepts of knowledge Necessary for Business Development	Related Subjects
39	(Partners, Local Partners, Designers, Consultants, suppliers and Subcontractors) Performance	Technical Knowledge and experience, Project management knowledge and experience, On time delivery, Quality of services, cost efficiency of the services, Certificates, Performance in host country bureaucratic system
40	(Partners, Local Partners, Designers, Consultants, suppliers and Subcontractors) Contact Info	Who knows what, Company Links, Contact information, Information flow Process, Communication management, Contact personals characteristics
41	Company Profile	Registry information, Business History, Key personnel, Memberships & Certificates, Business slogan
42	Business Strategic Plans and Targets	Target markets, Financial targets, Technical targets, Managerial targets, Target customers, Development plans, Investment plans, Business points of interest, Relationship strategy,
43	Business Development Routines and Tactics	Methods for entering different markets, tactics for achieving long lasting relations, Ways of creating new business
44	Own Company Current Business Status	Current projects, Current main markets, yearly domestic and oversea turnover, Current share in each market, Investments under progress
45	Own Company Financial Status	Yearly revenue, Net profit, Share price, Dividend policy, Company value, Dept amount, Equity amount, Financial structure, Working capital, Current and fixed assets, Liquidity statues
46	Own Company Human Resources Condition	Costs, Productivity, Quality
47	Own Company Material Resources	Costs, Procurement, Quality (Ready mix concrete, material produced by sub companies)
48	Own Company Financial Resources Condition	Financial credits, Equity, Depts...(Availability, beneficiary conditions, Administrative acquisition procedures)
49	Own Company Equipment & Machinery Condition	Costs, Availability, Procurement, Productivity, Quality
50	Own Company Innovations	Technical, Managerial, Contractual, Financial, Process oriented, Product oriented
51	Own Company Products & Services Technical Status	Construction techniques, Technical quality, Product type, Certificates and Licenses, Performance in different Site conditions.

Table 6. 3 Final list of knowledge concepts for BDM of construction companies (Continued)

No.	Concepts of knowledge Necessary for Business Development	Related Subjects
52	Own Company Products & Services Managerial Status	Environmental conditions, safety conditions, Scope management, PDS, Procurement management, Time management, Cost Management, Risk management, Partnering, Communication management, Procurement management, Certificates and Licenses, Financing plan

6.3.Development of a Taxonomy:

After acquiring the necessary data, it is needed to organize the unstructured knowledge so that it would represent the topic domain in a subjective way. The taxonomy should resemble a framework that demonstrates how experts in a domain see and categorize things in their minds in other words the taxonomy provides a decomposition of the contents within BD.

The offered taxonomy adopts a hierarchical structure with three levels. At the top level, business development is divided into 5 main classes which are: Business environment, Clients, Partners, Related parties, and Own company. The main classes are selected considering their vital role in the framework. It is believed that business development is the act of relating the products or services to available or potential clients in a business environment by means of partners and other related parties (Figure 6.1).

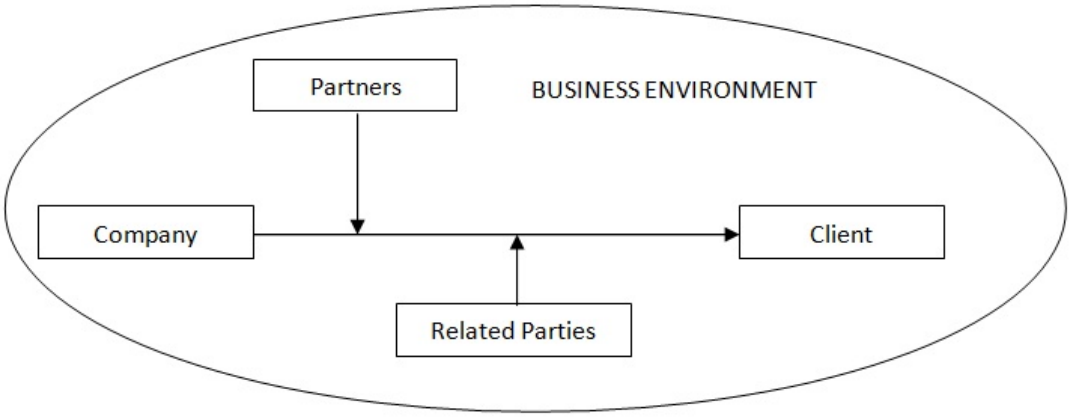

Figure 6. 1 Business development diagram

Figure 6.2 presents the higher classes in the taxonomy. Because of the huge size of the taxonomy, only a small part of the sub-concepts have been displayed. However a complete list of the classes and concepts inside the taxonomy can be observed in Table 6.4.

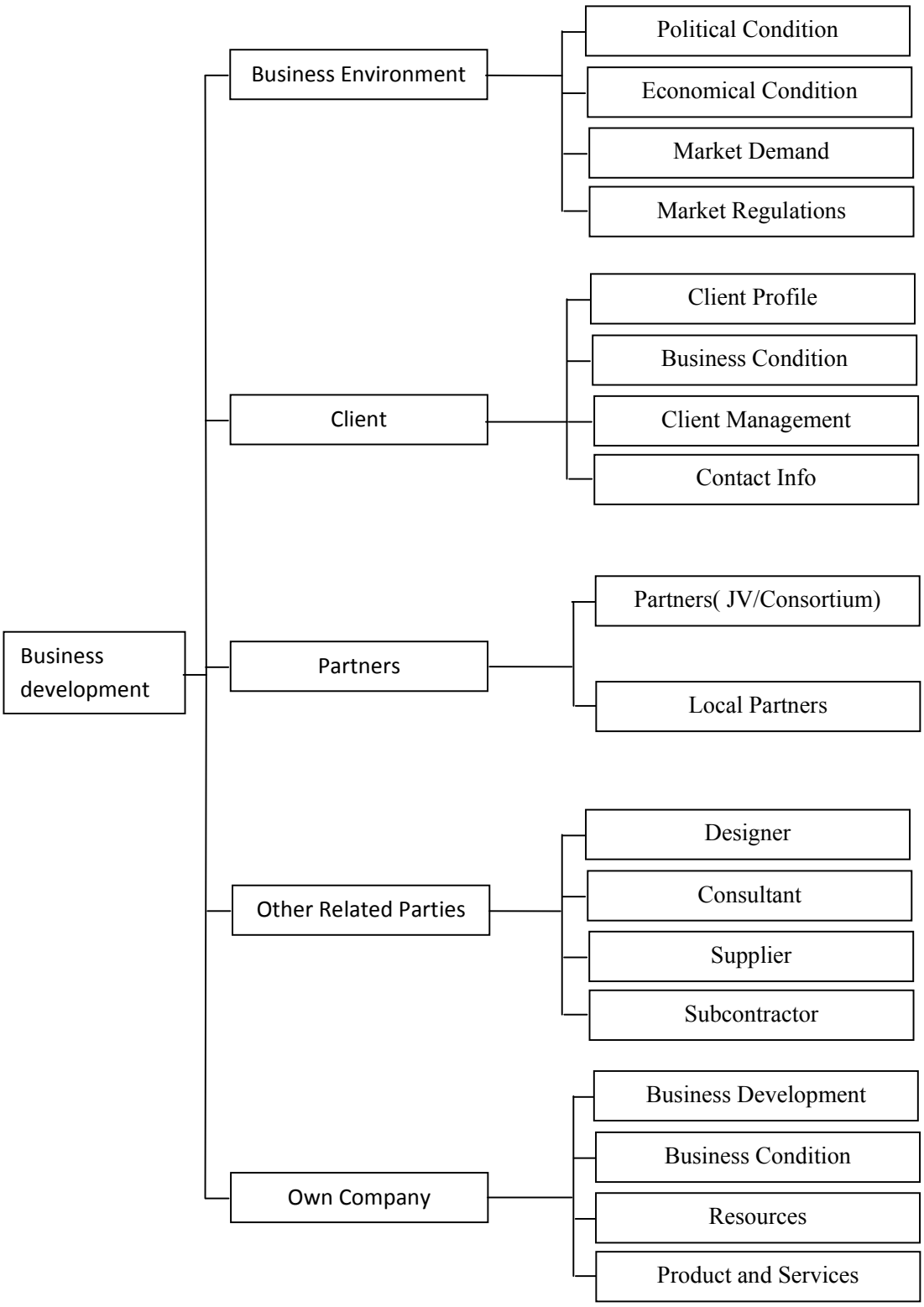

Figure 6. 1 Knowledge taxonomy for BDM

Table 6. 4 Knowledge taxonomy for business development management in construction companies

Business Environment	Host Country Political Condition	Government
		International Relations
		Strategic Plans
	Host Country Economical Condition	Economical Structure
		Financial Indexes
	Host Country Socio-Cultural Condition	Socio-Cultural Structure
		Social Disorders
	Host Country Judiciary Condition	Judiciary System
		Foreigners Conditions
	Host Country Nature	Geography
		Natural Resources
	Host Country Facility Services Condition	Infrastructure
		Servicing Organizations
	Market General Specifications	
	Market Demand	
	Market Regulations	Trade Regulations
		Business Regulations for Foreigners
		Operational Standards
	Market Competition	Competitor
		Competitive conditions
	Market Resources	Human Resource
		Material
		Financial
		Machinery and Equipment
	Market Contact Info	
Clients	Client Profile	
	Client Management	Characteristics
		Cultural Conditions
		Business Relations
	Business Condition	Strategic Plans
		Financial condition
	Contracting	Contractor Selection
		Contract Conditions
	Demand	
	Contact Info	

Table 6. 4 Knowledge taxonomy for business development management in construction companies (Continued)

Partners	Partners(JV/Consortium)	Partner Profile
		Management
		Business Condition
		Performance
		Contact Info
	Local Partners	Local Partners Profile
		Management
		Business Condition
		Performance
		Contact Info
Other Related Parties	Designer	Designer Profile
		Management
		Business Condition
		Performance
		Contact Info
	Consultant	Consultant Profile
		Management
		Business Condition
		Performance
		Contact Info
	Supplier	Supplier Profile
		Management
		Business Condition
		Performance
		Contact Info
	Subcontractor	Subcontractor Profile
		Management
		Business Condition
		Performance
		Contact Info

Table 6. 4 Knowledge taxonomy for business development management in construction companies (Continued)

Company	Company Profile	
	Business Development	Business Strategic Plans &Targets
		Routines & Tactics
	Business Condition	Current Status
		Financial Status
	Resources	Human Resource
		Materials
		Financial
		Machinery and Equipment
	Product and Services	Innovations
		Technical Status
		Managerial Status

In the following a brief description will be given about the importance and specifications of the classes in the top level of the taxonomy.

Business Environment

Business environment is the field that business interactions between the client and company take place and it is commonly known as the "Market". The condition of a business is highly dependent to the terms, rules and interactions governing in a business environment, therefore a business developer should know on what grounds he/she is playing on in order to prevent any unpredicted affect from outside the parties. This issue finds a higher level of importance when we are considering the construction business. It is widely accepted by a considerable number of researchers in civil engineering that construction projects have a high complexity derived from the dynamic interactions among various global, country and project-specific factors.

Business environment includes the host countries political, economical, socio-cultural, judicial, and natural conditions, more over it includes the market condition such as; demand, regulations, competition, resources, and the market connections.

Clients

In respect to their needs a client is the principle of a contractor or an agent. Clients are customer for the professional services provided by companies and they play the most vital role in the profit stream of the organization. Clients could be from the privet sector, public sector or Public-privet Partnership. Moreover clients could be local or international. Clients provide profit in return of the received services from the contractor, thus having knowledge about the client plays the crucial role in business development of a company. Information about clients would help the business developer to establish long-lasting and profitable relations with them and more over to control the cash inflow to the company. Knowledge about the client comprises of; client profile, management, business condition, contracting, demand, and contact information. It should be noted that if necessary, information about people's personality and characteristics should be stored in a professional and ethical way so that it would not be used as evidence against an individual or company.

Partners

Partnering is a strategic alliance between the participating firms which provides an opportunity to combine the specific competences and their supplementary resources in order to do what firms are unable to do alone. Partnering includes a high level of complexity due to the mixture of different cultures, managerial systems, attitudes, competitive strategies.

Partnering is an increasingly popular mode of market entry and expansion. Partnering provides the opportunity for; faster entry to markets and higher access to local markets, share or reduces cost and risks, acquiring knowledge and learning about technical or administrative knowledge also local business knowledge, access to suitable distribution channels and resource suppliers, local political advantages, and overcoming the cultural problems.

The main reason for separating partners from other related parties such as suppliers and subcontractors was the importance of partnering emphasized by BD experts. It is believed that partners have a high influence on the BD performance and a higher attention is needed on this issue.

Partnering is divided into JV or consortium partners and local partners. It is believed by the experts that local partners are a type of permanent partnering and it should be separated from other types of partners. Apparently local partners are appreciated on their level of performance about administrative and project management inside the local business environment whereas in the case of JV and consortium, partners are investigated on what they can bring to the table beyond the local market and in respect to risk management, cost management, technology, and etc. Knowledge about each of the partnering types mentioned above are divided into; partner profile, management, business condition, performance, and contact info (communication).

Other Related Parties

Based on construction specific particularities, construction services are transmitted through participation of different parties other than client, own company, and partners. These parties are categorized; designers, consultants, sub-contractors, and suppliers. These parties provide essential services that are needed for completing a construction project. Although it was believed by some experts that knowledge about these parties concerns the project managers and executive team, but many believed that without having knowledge about these parties, a business developer could not picture the process of the project completion, therefore he/she would not be able to predict the outcomes of the project for the company in order to decide on its profitability. Hence, having knowledge about their profile, management, business condition, performance and having the necessary contact info and communication knowledge has been seen important.

Company

Business developers are considered as salesman by many and considering the fact that you cannot sell what you do not know, having knowledge about the services that your company has to offer is mandatory. This information could be about the strengths and weaknesses of the company. This type of knowledge helps business developers promote the strengths and cover the weaknesses in order to close profitable deals. So having sufficient knowledge about own companies profile, business condition, resources, and products and services would help the business developer to represent its company in the best way. Finding deals that do not fit the company conditions would bring disappointing losses in time and cost. So therefore a business

developer should know his/her company well. More over they should be inform of the business development activities of their company, as a result, having a category for storing knowledge about business development performances of the company has been seen necessary in the taxonomy.

6.4.Validation of the Taxonomy

6.4.1.Workshop

As mentioned before, in this research, three tools were used for validating the taxonomy. The first tool was interactive workshops with three domain scholars who have a rich academic background in related topics. This included full presentation of the taxonomy, its application, a detailed examination of the concepts included, and the clustering patterns. Throughout this section, the dependability and apprehensibility of the taxonomy was questioned. At the end of the presentation all respondents believed that the taxonomy was understandable and it has a reasonable classification system. There were some criticizing points mentioned by the respondents but none of them were fundamental and they were mostly personal preferences that not all agreed on.

6.4.2.Navigation test

The second tool was a questionnaire survey with 2 domain experts to assure the external validity (applicability, and ease of use) of the proposed taxonomy. The experts were knowledgeable in construction management, design, project finance and all of whom have office and field experience. The survey included 53 pieces of hypothetical knowledge which were asked to be navigated and placed under the appropriate category inside the taxonomy. The pieces of knowledge are given in Appendix B. The aim of this test was to control the layering condition of the taxonomy and the feasibility to process through these layers to find the designated location of knowledge. At the end of the test it was seen that the experts were significantly confident in navigating through the taxonomy and tagging the knowledge subjects to the appropriate place. After the test the respondents were asked to comment about the traceability of the concepts inside the taxonomy.

The main problem that the respondents had faced during the test was misunderstanding some of the terminologies used in the test and taxonomy. This could have been expected since the respondents might have not encountered with some of the terminology in their professional life, regarding the comprehensiveness of the taxonomy. In addition it should be noted that neither of the respondents were native English speaking, so spite their good level in English literature, misinterpretation problems could be seen. Most of these problems were solved when the necessary explanations was given. A summary of the navigation test is given in table 5.3.

Table 6. 5 Results of the navigation test

Respondent	Correctly Navigated Concepts (%)	Final Comment
Respondent 1	85%	"good"
Respondent 2	74%	"Acceptable"
Average	79%	-

The results revealed that respondents are 79% correct in navigating the taxonomy which is accepted as an appropriate result. Also the respondents had a positive attitude towards the taxonomy and believed that it could be beneficial to the industry.

6.4.3.Case study

A case study is the last tool used for validating the taxonomy. To verify the results of the research a domain expert was interview with the aim of capture some of his knowledge in business development and to tag it inside the taxonomy. The domain expert was a highly skilled business development with more than 30 years of experience in different markets around the world. Initially the respondent was asked to talk about his previous BD experiences and the knowledge that he can shear with us. Later a verbal analyzes was conducted to identify the hidden knowledge inside his statements. Finally using the taxonomy, the respondent tagged the identified knowledge in appropriate places inside the taxonomy.

In the following a summary of the interview is given. The statements directly taken from the interview is given in quotation marks.

Summary of the interview

At the start of the meeting an explanation was given about the research and the taxonomy was fully presented. Later the purpose of the interview was explained and clarified. afterward the respondent was asked to shear some of his BD knowledge but as a common faced difficulty during all of the interviews with Turkish companies, misunderstanding problems was faced about knowledge and knowledge management. Therefore the respondent was asked to reveal some stories about his past experiences so that we can grasp the knowledge buried inside.

Initially he started by pointing out a project in Germany during 1992. He said that "at that year we won a tender for a housing project in East part of Berlin. At the beginning everything looked promising but when the excavations where started, there was some kind of oily material inside the foundation soil. When this was realized the project was stopped and environmental tests were conducted on that material. This delayed our project for 2 month."

Knowledge identified (no.1): Germany has very strict environmental regulations and environmental regulations are highly enforceable. So environmental issues of the project should be fully investigated and also your construction team must be well educated in this issue, based on German standards (environmental risk).

He continued "during the bid preparation for the project I was informed by the Turkish ambassador in Berlin that there was an agreement between the Turkish and German government stating that in every calendar year 5000 labor in total can come from turkey and work in Germany. Based on this information we prepared the bid and signed the contract but later when we applied for a group visa of our labor force, after 2 months we received a response which had rejected our request. This was because there was an explanation for this law which mentioned that this agreement is only for companies that work with governmental clients, unfortunately, none of the Turkish contractors had realized this explanation. There for we had to provide our labor from Germany and this ended in a loss of approximately 70% of project cost. This was because German labor cost 2.5 times more than Turkish workers"

Knowledge identified (no.2): Based on an agreement between Turkish and German governments, Turkish contractors can bring up to 5000 (in total) Turkish workers per year. But

this is only applicable if they work for governmental clients. This law is not effective for privet clients.

Knowledge identified (no.3): one of the best sources for information about governmental agreements between two countries is the embassies.

Knowledge identified (no.4): The bureaucratic period of applying for visa throw German embassy in Ankara is almost 2 months.

Knowledge identified (no.5): German labor cost 2.5 times more than Turkish workers

Moreover he mentioned "later we countered a bigger problem and that was; our client got bankrupt. The German government offered us that we can continue the project and make investment in German housing projects. At that stage in order to recover our initial loss we decided to overtake the project and invest in the housing industry of Germany. But unfortunately the German government had intended to rehabilitate the eastern part of Berlin. Governmental support, low land prices, and low level of competition attracted a huge amount of housing investment in eastern part of Berlin. This increased the number of houses offered in the eastern part of Berlin which caused a reduction in housing prices and because we already had two years of delay in our project completion date, it ended out in a big loss for our company"

Knowledge identified (no.6): Because of the low quality of housing in the eastern part of Berlin, German government tends to rehabilitate the housing condition in this region. In order to increase the speed of rehabilitation the government supports foreign investment in housing projects at this part of Berlin.

Knowledge identified (no.7): There is no regulation supporting contractor rights against client bankruptcy in Germany.

Knowledge identified (no.8): in feasibility study of investment plans you should consider the level of competition and the pace of investment in that particular field which can affect the demand in a specific market and decrease lower than the predicted prices.

He continued “our current international market is Oman. People in turkey and all around the world have a general view about X countries that they are liars, they are not trustable and there are no governing regulations. There is an old saying that in X countries ‘tomorrow never comes’. Which means you shouldn’t take and trust promises from their side. This may be true about some X countries such as E or L but there are some countries such as; emirates, Qatar, Yemen, Saudi Arabia, Oman and etc. that are different because their regulations are international regulations. For instance in emirates and Saudi Arabia US regulations are dominating, in Oman British regulations are dominating.

When a country implements international regulations, then that market becomes more secure for international contractors to work in.”

Knowledge identified (no.9): Country E and L and some other countries that do not adhere to international regulations and they are not totally transparent in their business.

Knowledge identified (no.10): UAE, Qatar, Yemen, Saudi Arabia and Oman are some of the countries in the region that adhere to international regulations.

Knowledge identified (no.11): British regulations dominate in Oman Market.

Knowledge identified (no.12): Level of Adherence of a country to international laws should be investigated at the study period of a market. The more they adhere to these laws, the further you are protected against injustice.

He continued “Construction business is collaboration between the client, engineer (consultant), and contractor. If engineer is missing and the client is undertaking the engineering responsibility by itself, this makes a bilateral business which has a higher potential for producing conflicts. This is because clients are not pure engineers so it is difficult to convince them. Moreover local engineers can be a source for many problems in projects too; therefore projects that employ international engineers are much preferable. It is much easier to solve problems with engineers but because of financial issues and the lack of proficiency, you cannot solve problems with the clients that easily. If you reach to a solution with your engineer, than they can convince your client about an encountered problem. Our engineer in Oman is Mase which is a high reputation British company”.

Knowledge identified (no.13): Omani clients and engineers have some lacks in construction knowledge; therefore it is difficult to convince them on technical conflicts. But in projects that there is an international engineer, problems are solved much easier.

"In order to encourage their local market, Omani government is holding all the tenders locally. To participate in local tenders in Oman, it is compulsory for international companies to establish a local company which at least 30% of this company is owned by Omani's. This is not required if you are participating in international tender. The Omani side can be an entity or privet personal. Usually the Omani partners are not looking for profit (30%) from the job, they are businessmen who just want 2% of the tender price as commission. There is a law in Oman that allows this act and protects you from paying 30% of the profit to the Omani partner. Therefore we went to an American company in Oman and ask them to prepare an agreement for us with the Omani side in order to legalize the offer mentioned act. The fee for this agreement was 15000$".

Knowledge identified (no.14): Omani government has a policy to support its local market and to increase the level of its local construction companies therefore; they hold most of the tenders locally, by this; they encourage international contractors to come and establish companies in Oman. This would help increase the performance level of local companies and it would help develop the local construction industry.

Knowledge identified (no.15): In order for foreigners to establish a local company in Oman, it is compulsory that 30% of the company must be owned by Omani's. The Omani side can be an entity or a privet partner. But usually the Omani partners are business men who are not interested in participating in the job; instead they just want a commission from the tender price. Our partners take 2% of the tender amount as commission.

Knowledge identified (no.16): in order to protect yourself from the risk of the Omani side asking for 30% of the profit instead of the 2% commission, there is a law that supports the agreement between your company and the Omani side. There is an American company that prepares these agreements for the price of 15000$.

“We make partnering in order to joint our forces and to share the risks. By partnering with company A we increased the size of the project that we were participating in from 100 million dollars to 200 million dollars. Also now we could fulfill the requirements of participating in highway projects.”

Knowledge identified (no.17): Our partner, company A is a highly experienced company in highway with many completed projects in this field, this company has the capacity to undergo projects with the size of 100milion dollar.

“There was a highway project in Oman that we were bidding for. Tenders in Oman generally require at least three similar completed projects. Initially we didn’t know this and later when we realized that we do not qualify for a specific project our chairman was saying that ‘if we had known this issue before we could find a new partner which fulfilled the requirements or even add a new partner to the structure of our local company’. And this is a lesson to be learned.”

Knowledge identified (no.18): The prequalification stage of tenders for highway projects in Oman generally requires at least three similar completed projects.

Other pieces of knowledge mentioned by the interviewee are:

Knowledge identified (no.19): In turkey the drawings are 75% complete and usually they miss the ground condition in tendering stage. So it is very risky to undergo lump-sum contracts. Contractors usually consider the combination of 30% clay, 40% sand and 30% rock when they are giving price for excavation work.

Knowledge identified (no.20): German government has a protectionism policy in infrastructure projects of Berlin and only German contractors are rewarded the infrastructure projects.

Knowledge identified (no.21): Independent third parties such as consultants (standard and poor’s or Ernst & Young) or local partners are the general sources for investigating the financial condition of the clients.

Knowledge identified (no.22): There is a new Turkish trade law coming out in first of July 2012 which supports Turkish contractors that work internationally towards financial risks of projects.

After identifying the lessons learned and the hidden knowledge these knowledge were placed under the appropriate categories inside the taxonomy (Table 6.6)

Table 6. 6 Case study results

Level 1	Level 2	Level 3	Captured knowledge
Business Environment	Host Country Political Condition	Government	The bureaucratic period of applying for visa throw German embassy in Ankara is almost 2 months
		International Relations	Based on an agreement between Turkish and German governments, Turkish contractors can bring up to 5000 (in total) Turkish workers per year. But this is only applicable if they work for governmental clients. This law is not effective for privet clients
		Strategic Plans	Because of the low quality of housing in the eastern part of Berlin, German government tends to rehabilitate the housing condition in this region. In order to increase the speed of rehabilitation the government supports foreign investment in housing projects at this part of Berlin.
			German government has a protectionism policy in infrastructure projects of Berlin and only German contractors are rewarded the infrastructure projects.
			Omani government has a policy to support its local market and to increase the level of its local construction companies therefore; they hold most of the tenders locally, by this; they encourage international contractors to come and establish companies in Oman. which will end in an increase in performance level of local companies

Table 6. 6 Case study results (Continued)

Level 1	Level 2	Level 3	Captured knowledge
Business Environment	Market General Specifications		E and L are some of the X countries that do not adhere to international regulations and they are not totally transparent in their business.
			UAE, Qatar, Yemen, Saudi Arabia and Oman are some of the Arabian countries in the region that adhere to international regulations.
			British regulations dominate in Oman Market
			Level of Adherence of a country to international laws should be investigated at the study period of a market. The more they adhere to these laws, the further you are protected against injustice.
	Market Demand		Because of the differences in housing quality of west and east parts of Germany and the low quality of housing in the east part, there is a high demand for investment in housing projects of east part of Germany.
	Market Regulations	Business Regulations for Foreigners	There is no official regulation or international agreement which would support foreign contractor against client bankruptcy in German construction market.
			In order for foreigners to establish a local company in Oman, it is compulsory that 30% of the company must be owned by Omani's. The Omani side can be an entity or a privet partner. But usually the Omani partners are business man how are not interested in participating in the job, instead they just want a commission from the tender price. Our current partners take 2% of the tender amount as commission. there is a law that supports the agreement between your company and the Omani side in order to protect you from the risk of the Omani side asking for 30% of the profit instead of the 2% commission, There is an American company that prepares these agreements for the price of 15000$.
		Operational Standards	Germany has very strict environmental regulations and environmental regulations are highly enforceable. So environmental issues of the project should be fully investigated and also the construction team must be well educated in this issue, based on German standards. (environmental risk)

Table 6. 6 Case study results (Continued)

Level 1	Level 2	Level 3	Captured knowledge
Business Environment	Market Competition	Competitive conditions	There is a new Turkish trade law coming out in first of July of 2012 which supports Turkish contractors that work internationally towards financial risks and bankruptcy.
		Competitor	In feasibility study of investment plans you should consider the amount of investment in that particular field. A high level of investment will produce more offers for a specific product which can affect the market and fluctuate the prices.
	Market Resources	Human Resource	The cost of German labor is 2.5 times more than Turkish ones.
	Market Contact Info		One of the best sources for information about governmental agreements between two countries is the embassies.
Clients	Client Profile		In turkey the drawings are 75% complete and usually they miss the ground condition in tendering stage. So it is very risky to undergo lump-sum contracts.
	Client Management	Characteristics	Omani clients and engineers have some lacks in construction knowledge; therefore it is difficult to convince them on technical conflicts. But in projects that there is an international consultant, problems are solved much easier.
	Contracting	Contract Conditions	In Oman; the prequalification stage of tenders of highway projects generally requires at least three similar completed projects.
	Contact Info		Independent third parties such as consultants (standard and poor's or Ernst & Young) or local partners are the general sources for investigating the financial condition of the clients.
Partners	Partners (JV/Consortium)	Partner Profile	Company A is a Turkish originated company and they are highly experienced in highway projects with many completed projects in this field.
		Business Condition	Company A has the capacity to undergo projects with the size of 100 million Dollar.

Throughout the validation process it was seen that the taxonomy fully covers BD knowledge in construction companies and it is a reliable source for representing and managing the domain related knowledge concepts.

CHAPTER 7

DEVELOPMENT OF A KNOWLEDGE MANAGEMENT TOOL FOR BUSINESS DEVELOPMENT IN CONSTRUCTION COMPANIES

As a final task in this study, the benefit of the taxonomy in categorizing and representing relevant knowledge is demonstrated by developing a computer program for managing business development knowledge in construction companies. The developed tool was coded in Java and is a demo of a knowledge management tool utilized in capturing, storing, and exploitation of business development knowledge for decision supporting purposes. This KM program includes such materials as tacit knowledge (know-how), explicit knowledge (documents & reports), expert suggestions, and innovations. Although this software is not a management tool which can be used directly in practice, but instead, it provides valuable perspectives for producing knowledge management toolkits.

The initial aim behind the presented tool is to provide a program that helps organizations capitalize the valuable knowledge inherited by business developers for future uses. Therefore a conceptual frame work for capturing this knowledge was needed to be developed. Figure 7.1 demonstrates the purposed conceptual framework. The main components of the framework are knowledge sources, knowledge manager, knowledge experts, knowledge management tool, and knowledge users.

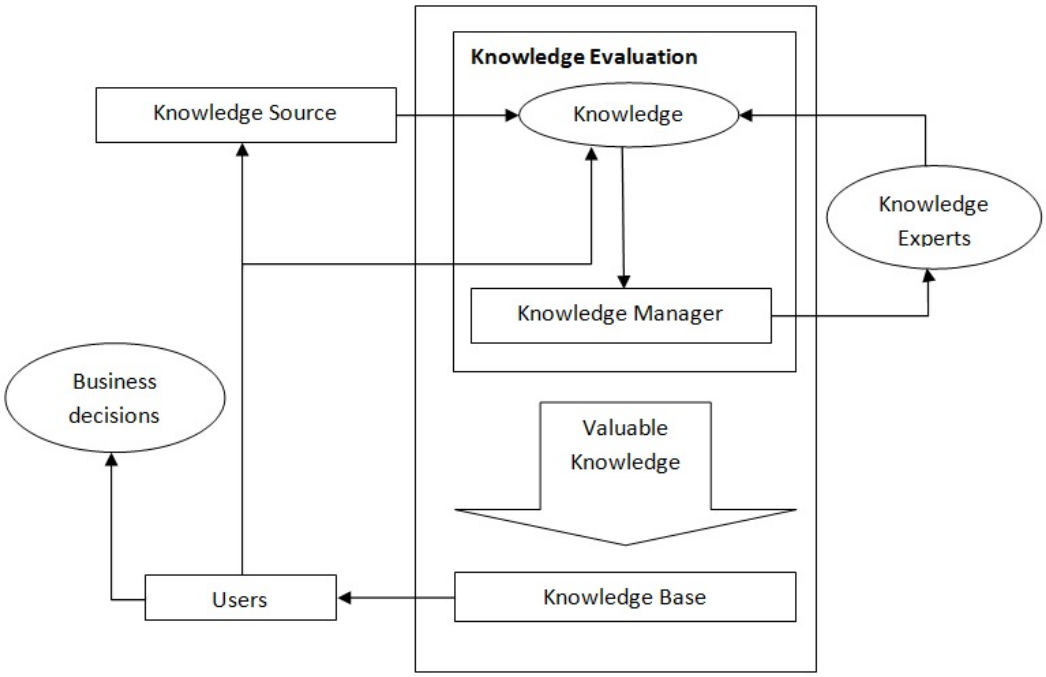

Figure 7. 1 conceptual framework for capturing valuable knowledge

The main idea governing the frame work is that; the knowledge has to be socialized in order to be improved and enriched. The critical point is that each person in the organization should be willing to shear their knowledge. Therefore as stated by Mezher et al (2005), cultural barriers should be solved in order to have an efficient knowledge management system. Of course from the other side, having a knowledge management system can be beneficial in overcoming these barriers as well (Mezher, et al., 2005).

Knowledge sources could be: external, internal, and organizational sources. Feed backs provided by users are also considered as a source of knowledge to supply the KM system with relevant knowledge. The knowledge manager could be an individual or a team of experts (depending on the amount of work) who are sufficiently dominant on the concept of knowledge and knowledge management. The knowledge manager(s) are responsible for controlling the efficiency and viability of the KM system. The knowledge management unit can be supported by knowledge workers in order to generate, represent, transfer, and use knowledge for creating competitive strategies and innovations. These knowledge workers can be the engineers and experts working in the organization (Kivrak, et al., 2008). The knowledge management together with knowledge experts comprises the knowledge validation unit. Knowledge experts are highly experienced people who are trusted by the knowledge management in their own field of

specialty. When knowledge is sheared on the knowledge management system, in order to validate this knowledge, the knowledge manager asks the related knowledge expert to approve the validity of that knowledge. The knowledge experts could either be from inside the organization or, a trusted person from outside. It is only with the approval of sufficient number of experts that the knowledge would be certified to be uploaded to the system. As it will be mentioned further on, the available material on the KM system are still open for crediting and criticizing of the users. An additional responsibility of knowledge manager(s) regarding the viability of the KM system is managing the format of knowledge inside the system so that it maintains its uniformity.

Tools are defined as; technologies that support the performance of actions and activities (Ruggles, 1997). As mentioned above, the initial ambition for developing a knowledge management tool is to facilitate the knowledge capturing and reuse of the business development unit in construction organizations. It is obvious that such tools can only be useful if all of the knowledge holders are dedicated to share their knowledge. The functional structure of the program is demonstrated in Figure 7.2. This program is a web-based software that enables a wider accessibility for all users. Every user has a personnel user name and password that provides access to his/her profile. This is to provide security for the accessibility of the materials inside the system and to protect this asset of the company from the access of unauthorized personnel. Moreover, having a user name and password can help the knowledge manager classify the knowledge that each employee can access regarding what every employee should or shouldn't know.

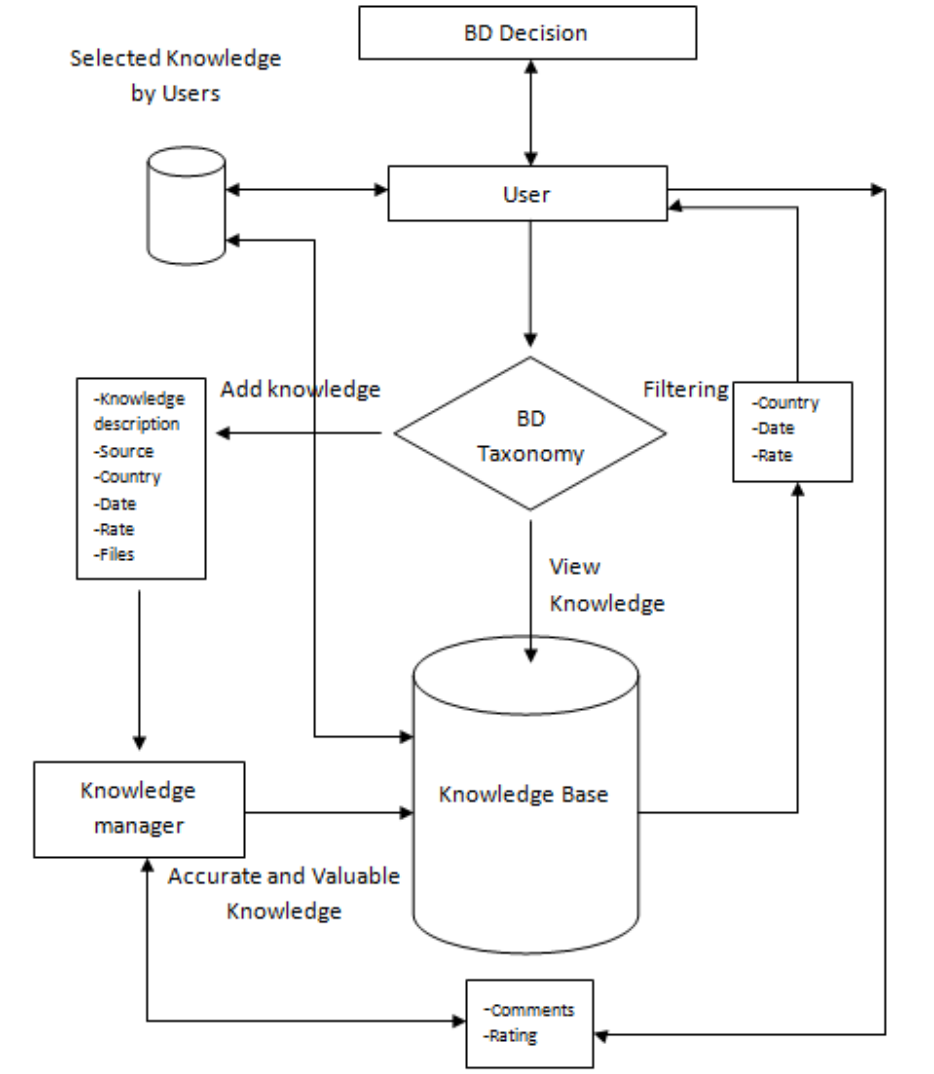

Figure 7. 2 The functional structure of the developed tool

After users log into the system a page which contains a tree search-structure designed based on the hierarchy leveling system of the presented taxonomy will appear. Each level is shown with dropdown lists that contain concepts and categories from the taxonomy (Figure 7.3). The advantage of a tree searching system in knowledge management can be the simple browsing system and its benefit for knowledge dissemination in an organization. It is believed that the taxonomy structure would help users to easily identify the necessary knowledge and this would compensate the difficulties in finding relevant knowledge pointed out by Kivrak et al (2008).

Figure 7. 3 Hierarchal Search structure

After browsing to the desired concept, there are options depending on whether the user wants to add or retrieve knowledge. If the user chooses to add knowledge a window similar to Figure 7.4 would open providing the user with vacant spaces to fill the data about the country, source, company, client, initial rate, and the date of knowledge to be added. More over the user can attach relevant files to the uploaded knowledge in order to provide better understanding. The added knowledge has to be verified by the knowledge manager before it can be saved on the system.

The knowledge can be related to a specific country, client, company, or it can be general to all cases. Adding the date is considered important in view of the possible changes in conditions and the fact that the material can be out dated and need revision. Specifying the source of knowledge provides a reference for dipper investigation if needed. Coding is for providing simplification in indexing the knowledge for supporting future uses such as knowledge engineering purposes. The initial value rate is the rate that the knowledge provider gives for the importance and accuracy of the knowledge based on his/her own judgment. This rate has to be modified by the knowledge manager before it is published for other users to see.

Figure 7. 4 Knowledge input screen for business enviroment

In cases when the user wants to view the available knowledge in order to support its expert decisions, the business developer has to navigate to the necessary concept and press the view button. By doing this; a window similar to figure 7.5 will appear which demonstrates the knowledge available for that specific concept. In this window as it can be seen, the user has filtering options for the knowledge based on the range of date, range of rate, related country, company or client name, and knowledge source. The filter options were considered in order to facilitate the knowledge identification for the users. In the view screen, the user can see the code for the knowledge, the related country, its source, short description of knowledge, and the knowledge itself. Relevant files can be viewed from this page as well. Moreover, the value rate and comments about a specific knowledge can also be observed.

The value rate is a number ranged from 1 to 10, with 10 resembling very precise knowledge and 1 resembling imprecise knowledge. The value rates should also resemble the beneficial level of knowledge. The score shown for the knowledge in the view page is the weighted average of the scores given by different expert users (weights depend on the level of experience) to that specific knowledge based on its preciseness.

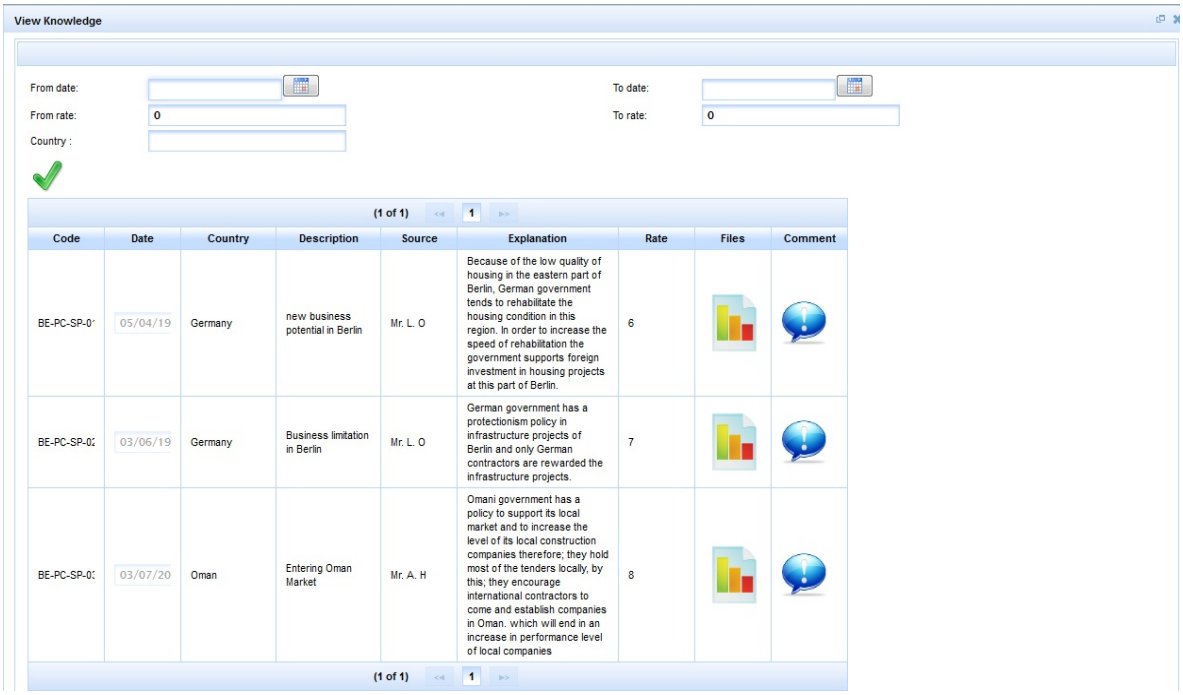

Figure 7. 5 Knowledge view screen

Every user that has access to the knowledge in the program, can rate and comment about the available knowledge. This option was provided for evaluating the available knowledge so that the knowledge could be discussed in order to be rectified and improved. The influence (weight) of the rates given by users is related to the level of experience and knowledge of that specific user. It is up to the top management and the knowledge manager to decide on the weight related to each experts opinion.

Knowledge is considered as justifiable truth and in general any truth is known to be valuable, but depending on the point of interest, the importance of knowledge differs from one individual to another. Knowledge is considered important if it is applicable in benefiting the objectives of an individual or organization. This benefit could be related to time, cost, quality, or morality. For this reason, before evaluating the importance of knowledge we should specify the objectives and values. For example if an expert is assigned for business development in country A, the importance of the knowledge related to that country would have a higher level compared to the knowledge related to country B or C. this is true for the case of organizations too. Experts involved in a specific activity should have the capability to recognize the usefulness of knowledge in their field of activity. They can see the benefits of knowledge in untying the nods in a process or the affect of it on final results. Therefore, the experience and level of

understanding of the expert related to a specific domain plays an important role in identifying useful knowledge. For this reason, an additional feature for this software has been considered which is; the users can have a copy of the knowledge that they find more important in their own profile in order to have easy access to them in decision making processes. The personalized knowledge is viewable by other users. This by itself is a way for evaluation of knowledge in a way that users can see which knowledge have been appreciated more by other users. It should be put under account that this type of knowledge evaluation can lead to a reduction of exploring available knowledge because users may prefer just to read the highly cited knowledge and not bother understanding and enriching other potentially valuable knowledge.

It is believed that this tool can help experts in their decision making process in a way that before making a business decision, experts can refer to this system and view the direct or indirect knowledge available about a specific client, market, partner, and so on. In this way, the experiences of the past can be used to enrich today's decisions making process and the company can benefit from the knowledge embedded in it to gain competitive advantages.

Benefits of using the tool

As stated by Williams (2008) the dominant discussion of KM is "to capture, codify, use, and exploit the knowledge and experience of employees by developing better tools and methods and by developing a willingness and ability to use those methods". It is believed that the presented tool supports the discussion mentioned by Williams since; it provides a user friendly platform for capturing, codifying, shearing, and using the knowledge of employees. Moreover, as pointed out by Ozorhon et al (2005) and Dikmen et al (2005) the tools provides a technological support for the formation of OM to store valuable knowledge and contribute to the OL.

The presented system can provide a valuable knowledge bank for professionals to refer to when facing different decision making conditions. The material in the system provides a valuable base for SWOT analysis of the business developers considering new business conditions such as: entering new markets, finding new clients, and undergoing new projects. It is believed that the presented tool is; cost efficient, legally appropriate form copyright and ethical point of view, accurate in providing knowledge in a standard format, and acceptable considering the amount of extra workload. Therefore the tool encompasses the requirement of Tan et al (2006) for capturing and reusing of knowledge. Moreover, the presented tool is a good representation for the benefits of the developed taxonomy in structuring business development knowledge. The

implemented structure would help users to easily identify the necessary knowledge and compensate the difficulties in finding relevant knowledge pointed out by Kivrak et al (2008).

Finally other benefits of the tool could be summarized as:

- It prevents project amnesia by capitalizing the valuable knowledge and lessons learned.
- It provides technological support for the concept of knowledge management in construction organization.
- Contributes to the knowledge creation and innovation of the organization.
- Ensures the availability of BD knowledge across the organization.
- It supports the learning mechanisms of the organization.
- It encourages the knowledge shearing culture of the organization.

CHAPTER 8

CONCLUSION

This chapter concludes the main findings of the research referring to the importance of business development and knowledge management in construction organizations, the applied taxonomy development methodology, stages of developing a framework for the knowledge in business development domain, and the usability of the taxonomy.

The foremost objective of this study is to develop a comprehensive and apprehensible taxonomy for business development knowledge en route for supporting KMS in construction companies. Moreover, by developing a taxonomy, this study aims to provide a semantic representation in the domain of BDM of construction companies. To achieve these objectives, the study was conducted through two sequential parts: data collection for the study by literature analyze and industry survey, developing a knowledge taxonomy for BDM.

At the first part of this study the concepts of KM and BD was introduced and the knowledge concepts of BD domain were identified and presented after a comprehensive review on the available literature. To validate the identified concepts and for a deeper investigation about the existing knowledge concepts in BDM, industry professionals were interviewed. For this purpose Semi-structured interviews are selected because of 3 reasons:

1) In order to have a deep investigation on the subject. Due to the fact that no similar work was available on the selected topic, deep investigation was seen necessary for apprehending the topic.

2) In order to have a better understanding of knowledge shearing process of the Turkish professionals. It is believed that narratives and socialization are among the main methods of transferring knowledge. Interviews are a good way for demonstrating and understanding these methods.

3) For having answers in accordance with the scope of the study. It was believed that KM is a new subject in Turkish construction industry. Therefore comprehension problems can be expected in understanding the questions and the expected responses.

As a benefit of semi-structured interviews we can mention that; because there is no strict framework in carrying out the interview, the interviewees can freely express their idea about the topic. Therefore it is believed that a wider range of information can be discussed resulting in a better understanding of the domain. Semi-structured interviews can be very beneficial for collecting data on a topic that we don't have enough recognition about it.

The major conclusions derived as a result of this part of the study are as follows:

1) A comprehensive list of knowledge concepts was provided.

2) It was revealed that in general the knowledge of BD include, knowledge about business environment, clients, partners, other related parties, and own company. This contributes to the available literature which consider "host country", "client" and own country as the main knowledge areas of BD.

More over some general conclusions about Turkish construction was also achieved such as fallowing:

1) Turkish contractors generally consider knowledge management and knowledge acquisition for business development purposes at a very high level of importance.

2) Apart from some companies that possess ERP systems, the rest of the companies do not have any specific system for KM proposes in BDM.

3) Mainly the pieces of knowledge kept by business developers for business development purposes were: country knowledge, market knowledge, and knowledge about partners and other related parties.

One major shortcoming of the employed methodology is that the findings reflect the Turkish contractor's opinion on knowledge related to BDM. Despite this short coming, it is believed that the findings can be useful for all contractors, particularly the ones that have similar profiles and are active in developing countries such as the markets in Middle East, Africa, and CIS. Moreover, it should be taken into consideration that the results of the research are limited only

to twelve experts understanding of the domain. The respectively low number of academic literature available for the review part is another shortcoming of this research.

The second part of the study was to develop a structure to classify the identified knowledge concepts. Taxonomy was intended to be designed throughout the scope of this study, since it provides a semantic representation of knowledge practical for more sophisticated uses in Meta knowledge (such as knowledge management applications). Through the development of taxonomy the collected knowledge was organized and represented successfully.

Three steps of methontology framework was fallowed for developing the taxonomy. This process comprised of “specifications”, “conceptualization”, and “evaluation”.

The validation of the taxonomy considering its apprehensiveness and comprehensiveness was conducted by the means of three validation tool. To begin with, an interactive workshop with three domain scholars investigating in related topics was performed. The dependability and apprehensibility of the taxonomy was questioned in this part. The second tool was a navigation test with two domain experts by the means of a questioner survey. This time the layering condition of the taxonomy and its simplicity in progressing through its layers is investigated. It was seen that in average 79% of the pieces of knowledge were navigated correctly. Case study was the third tool applied in the validation section. For this reason an interview with a highly experienced professional in BDM was conducted in order to test the ability of the framework in identifying, capturing, and storing real life knowledge. At the end of this section it was concluded that the developed taxonomy has proved to be comprehensive, simple to use, and highly capable piece of Meta knowledge for business development management. It is seen that the taxonomy successfully fulfills the balance between depth and coverage. At the end of the study, In order to demonstrate one of the utilization aspects of the offered taxonomy in representing the domain knowledge, sample software for knowledge management in construction companies is developed and presented.

The main shortcoming of this section is believed to be the subjectivity of the validation tests which is an inevitable fact for qualitative researches.

To conclude, despite some of the shortcomings in the study, it is believed that the objectives of the study are maintained successfully. A comprehensive and apprehensive structure for

representing the knowledge of business development management in construction companies is presented. It is believed that the offered taxonomy can support experts in the design of knowledge management and decision support systems. In addition the semantic representation is considered valuable in providing bases for further researches concerning BDM. While the focus industry for this study is construction, it is believed that the developed taxonomy can be modified and adopted for other project based industries as well.

In regard of this research it is recommended that, other data collection methods or target population (other than Turkish construction industry) could be applied for further investigation on the domain. The comparison of those studies with the results of this study can provide a deeper understanding of the knowledge in BDM covering global wide construction companies. Further research is recommended in order to improve the current taxonomy into ontology for implementation reasons. Additional supporting research on understanding the topic of KM in business development management is seen to be useful. The advertisement methodologies for the construction industry are recommended to be investigated due to the lack of proper understanding realized among sector professionals. And finally a gap is extremely realized on the methods for codifying experience related tacit knowledge such as negotiation, communication, relation management strategies, etc. check lists are recommended to be useful for this propose.

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APPENDIX A

Sample questionnaire

1- Scope of the survey

This survey has been developed for a master's thesis "Developing a Data and Knowledge Taxonomy for Business Development in Construction Industry" which is under preparation in Construction Engineering and Management division of Middle East Technical University.

Business development is the act of researching and identifying available and potential types of business in the existing markets in order to attract new clients and maintain the existing ones for long and short term profits. Business development is the main unit which guides a company in order to expand its business in a specific sector or more importantly to survive in the competitive market.

The main purpose of this research is to come up with a conceptual hierarchy for the knowledge and data necessary for business developers to aid them in their professions. For this reason we are trying to develop a taxonomy for business development knowledge and data through interviews with business development professionals in construction companies.

In the progress of this research, we initially try to identify what kind of knowledge or data is/or should be stored in company databases for business development purposes. This kind of knowledge and data are the ones that can be used for different purposes such as; helping to plan the competitive strategies of a company through identifying strength and weaknesses of the organization, it can be used for identification of new business opportunities, etc. Later we will classify our findings in a frame of a taxonomy which would help business developers.

This taxonomy could be used for representing, storing, sharing, retrieving and in general, managing knowledge/data for business development purposes. Other uses of this taxonomy can be preparation of a knowledge base for business developers for SWOT analysis before making business decisions such as; entering new markets, finding new clients, undergoing new projects etc. More over the taxonomy can provide a semantic representation of the concepts of business development knowledge and data.

All of the information provided by the participators of this survey will stay confidential, company name will be withheld and data will only be used for academic purposes.

We would like to thank for your time and contribution in our study.

Amin Haghgooie, MSc candidate

Thesis supervisors: Prof. Dr. irem Dikmen Toker & Prof. Dr. M. Talat Birgönül

2- General Information

a) Please state your full name, job position in the company and number of years that you have been active in construction sector.

Name…… Job position……

Experience…….. (Years)

b) For how many years has your company been active in the construction sector?

……

..

c) What is your Company's approximate annual turnover?

…… US Dollars. (Domestic)

…… US Dollars. (Overseas)

d) What is the number of employees in your company?

□ <100 □100-500 □ 500<

e) What is your company's main construction field of activity? (Check the appropriate boxes)

□ Building

□ Housing

□ Infrastructure

□ Transportation

□ Industrial

□ Energy

□ Other ……..

f) What is the percentage of public, private and public-private partnership clients that you work with? (Summation should be 100%)

Public……..% Private……..% Public-Private partnership……..%

g) What is the percentage of your work with new clients and repeated clients? (approximately)

Repeated client……..% New client…….%

h) What percentage of your work are competitive bid and what percentage is negotiated?
Publicly bid……....% Negotiated……. %

i) The main responsibility of a business development department (manager) is to maintain and extend the business level of the company (by entering new markets, finding new customers and maintaining current customers etc). How do you consider the level of your company's performance in business development compared with other Turkish companies (mainly your major competitors)? (Check the appropriate box)

□ Very low
□ Low
□ Medium
□ High
□ Very high

j) Please name the construction markets (countries) that your company has operated in.
……....
..

k) Does your company operate in other sectors related or unrelated to construction? Please name them.
……
..

3- What is the importance of knowledge and data acquisition for business development? (Check the appropriate box)

□ Very Low □ Low □ Medium □ High □ Very High

4- What pieces of data/knowledge do you keep in your databases for the business development purposes of your company?

5- Do you use any software for storing data?

6- What pieces of data/knowledge is critical for business development, thus, what kind of data/knowledge do you think it should be stored?

Do you think the following data and knowledge categories are important for business development?

Main Category	TYPE of data/knowledge	Critical	Medium	Not critical
Host Country	Host Country Political Structure			
	Host Country Foreign Policy			
	Host Country Economic Structure			
	Host Country Financial Indexes (last 5 years)			
	Host Country Social Structure			
	Host Country Social Disorders			
	Host Country General Geography Condition			
	Regional Geography Condition			
	Host Country Legal Structure			
	Host Country Market Structure			
	Host Country Infrastructure Condition			
	Host Country Constructional Resources Condition			
	Host Country Non Constructional Resources Condition			
	Host Country Construction Market Business Regulations			
	Competitors General Information			
	Competitors Business Information			
	Company Competitive Advantages in that Specific Market			
	Market Demand			
	Occurred changes in the Market and their Causes			
	Possible Future Changes in the Market Caused by Current Conditions			
	Advertisement Methodology			

	Market Connections			
Client (current & potential)	Client Profile			
	Client Management Personality			
	Client Customer Relations			
	Client Business Strategy (administrative)			
	Client Preferences and Expectation			
	Client Financial Condition			
	Occurred Changes for the Client and there Causes			
	Possible Future Changes for the Client Caused by Current Conditions			
	Clients Available Projects			
	Client Future Demands			
	Client Communication			

Company	Company Registry Information			
	Company Business Status			
	Company Organization Data			
	Company Resources			
	Partners (JV/Consortium) Information			
	Company Suppliers and Subcontractors Information			
	Designer Information			
	Consultant Information			
	Company Innovations			
	Previous Projects Information			
	Technical Development Requirements			
	Resources Development Requirements			
	Managerial Development Requirements			
	Business Development staff			
	Business targets			
	Knowledge about Business Development Strategies and Tactics			
	Business Development Performance Evaluation			

7- In this point I would like to have your comments about the classification system and inclusiveness of my taxonomy.

APPENDIX B

Knowledge pieces of the navigation test

Please tag the fallowing pieces of knowledge to the appropriate concept in the taxonomy.

1- Knowledge about market seasonal attitudes
2- Knowledge about technical advantages in a market
3- Knowledge about Local Labor productivity in a market
4- Knowledge about host country foreign investment policies
5- Knowledge about own companies financial targets
6- Knowledge about construction technical quality of the own company
7- Knowledge about the technical professionalism level of the designer management
8- Knowledge about the cultural condition of the partners
9- Knowledge about the of bureaucratic system of the consultant
10- Knowledge about the host country account balance
11- Knowledge about the mineral resources of a country
12- Knowledge about the ethnic groups in the host country
13- Knowledge about political corruption in the government of a country
14- Knowledge about the establishing work permit for foreigners in a country
15- Knowledge about contact personnel in a market (who knows what)
16- Knowledge about the medical services in a specific country
17- Knowledge about the cost of the human resources in own company
18- Knowledge about clients level of transparency in its business
19- Knowledge about the civil war in a country
20- Knowledge about the quality of internet in a country
21- Knowledge about competitors bidding tactics
22- Knowledge about the technical competency of local partners
23- Knowledge about the clients construction budget
24- Knowledge about the certificates required by the client for contractor prequalification
25- Knowledge about the project size that the company is qualified to undergo
26- Knowledge about the climate of a country
27- Knowledge about products demanded in a market
28- Knowledge about Legal system in a country
29- Knowledge about payment types of the client
30- Knowledge about construction project demanded by the client
31- Knowledge about the level of repeated orders to the suppliers
32- Knowledge about own companies projects in hand
33- Knowledge about the productivity of the machinery and equipment of the own company
34- Knowledge about information flow process from and to the client
35- Knowledge about company Innovations in project process
36- host country is membership in international trade agreements
37- knowledge about the interest rates in a country
38- knowledge about the justice of the judicial act for foreigners
39- knowledge about the licenses and permits in order to work in a market
40- knowledge about the quality of construction materials in a market

41- Knowledge about the market image of a client
42- Knowledge about the construction design codes in a market
43- Knowledge about the process of benefiting of a financial resource of a company (Loan from the home government)
44- Knowledge about the fixed assets of own company
45- Knowledge about the organizational structure of the consultant
46- Knowledge about the Procurement process of construction equipment in a market
47- Knowledge about the linguistic interactions with the client
48- Knowledge about client relationship management
49- Knowledge about the financial support offered in a market
50- Knowledge about the business history of own company
51- Client future Investments plans
52- Knowledge about the relationship management of the subcontractor
53- Knowledge about the work load of the suppliers