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Multi-criteria decision analysis for business intelligence : the case of a membership-based organization

Maher Hushaysh

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Thèse de doctorat
pour obtenir le grade de Docteur de
l'Université Polytechnique Hauts-de-France
Discipline : Sciences de l'Information et de la Communication

Présentée et soutenue par Maher Hasan HUSHAYSH

le 6 décembre 2019
à ARENBERG Créative Mine, France

Ecole doctorale : Sciences de l'Homme et de la Société (ED SHS 473)
Laboratoire de recherche : Design Visuel et Urbain (DeVisu – EA 2445)

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The case of a membership-based organization**

**Analyse de décision multicritère en *Business Intelligence* :
le cas d'une organisation à base d'adhérents**

Jury

- Christian BOURRET. Professeur des Universités. Université Paris-Est Marne-la-Vallée. Examineur.
- Igor CREVITS. Maître de conférences habilité à diriger des recherches. Université Polytechnique Hauts-de-France. Co-directeur.
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- Hafida BOULEKBACHE, Professeur des Universités. Université Polytechnique Hauts-de-France. Présidente du jury.
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- Imad SALEH. Professeur des Universités. Université Paris 8. Rapporteur.



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Abstract

Business information is vital today for the operation of any organization or business. While, big enterprises can, to some extent, fulfil their information needs based on their own resources and capacities, this is not the case for the majority of Small and Medium Sized Enterprises (SME) due to a lack of resources. Therefore, SMEs look for support from external bodies such as governmental agencies and non-governmental bodies, like Business Membership Organizations (BMOs), to meet their information needs.

This state of affairs applies to the stone and marble SMEs in Palestine. They represent the backbone of the industrial sector in the country. The stone and marble SMEs face many challenges. This leads them to look for external support mainly from the Union of Stone and Marble Industry (USM) as their main representative organization.

In this context, the overall objective of this study is to analyse the informational and communicational role of the USM and to put forward an appropriate configuration of a Business Intelligence (BI) system for the USM so that it can fulfil its informational mandate to member SMEs in a more effective way. To do this, a literature review was carried out into the informational and communicational roles of BMOs, the concept of BI and its implementation, and Critical Success factors (CSFs).

This led to using a decision aiding process, in particular, the PROMETHEE outranking methodology to develop and evaluate different alternatives of how to operate each of the BI process tasks. A decisional Delphi Technique was adapted to derive a set of evaluation criteria in order to evaluate the performance of different alternatives for each Business Intelligence Process (BIP) task.

The findings of the study showed that the USM need to work mainly with the Palestinian Stone and Marble Centre in order to develop its BIP tasks. The researcher recommends step-by-step interventions to ensure a successful implementation of BI so that the USM can better fulfil its informational and communicational role.

Keywords: Business information, Business Membership Organization (BMOs), Union of Stone and Marble Industry (USM), Business Intelligence (BI), Decision Aiding Process (DAP), Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE).

Résumé

L'information en entreprise est, de nos jours, vitale pour le fonctionnement de toute organisation ou entreprise. Bien que dans une certaine mesure, les grandes entreprises peuvent répondre à leurs besoins informationnels en fonction de leurs ressources et compétences, tel n'est pas le cas de la majorité des Petites et Moyennes Entreprises (PME). Ces derniers ont un manque manifeste de moyens et d'effectifs. De ce fait les PME cherchent du soutien auprès des organismes extérieurs comme des agences gouvernementales et non-gouvernementales, telles des *Business Membership Organizations (BMOs)*¹, afin de satisfaire leurs besoins informationnels.

Cette situation s'applique en Palestine aux PME de la pierre et du marbre, qui représentent le pilier du secteur industriel du pays. Les PME de la pierre et du marbre font face à de nombreux défis ; par conséquent, elles recherchent un soutien extérieur, particulièrement auprès de l'*Union of Stone and Marble Industry (USM)* en tant que structure représentative principale.

Dans ce contexte, l'objectif général de cette étude est d'analyser le rôle informationnel et communicationnel de l'*USM* et de déterminer la configuration appropriée d'un système de *Business Intelligence* (« Intelligence d'Affaires ») permettant, ainsi, à l'*USM* de remplir son mandat informationnel auprès de ses membres de PME.

Un processus d'aide à la décision a été utilisé, notamment la méthode de sur-classement *PROMETHEE*, pour développer et évaluer les différentes approches concernant la manière de mettre en œuvre des tâches au sein d'un système de *Business Intelligence*. Pour ce faire, une revue bibliographique a été effectuée, traitant du rôle informationnel et communicationnel des *BMOs*, du concept de *Business Intelligence* et de sa mise en place, ainsi que des facteurs clés de succès. Par la suite la technique *Delphi* fut appliquée pour établir un ensemble de critères d'évaluation afin de mesurer la performance des différentes approches pour chaque tâche d'une *Business Intelligence Process (BIP)*.

Les résultats de l'étude montrent que l'*USM* doit collaborer principalement avec le *Palestinian Stone and Marble Centre* afin de réaliser ces tâches d'une BIP. Le chercheur préconise des interventions étape par étape afin d'assurer le succès d'un système de *Business Intelligence* à l'*USM* afin de mieux réaliser son rôle informationnel et communicationnel.

Mots clés : Information d'entreprise, **Association** d'entreprises adhérentes, *Union of Stone and Marble Industry (USM)*, Intelligence d'Affaires, Processus d'Aide à la Décision (PAD), *Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE)*

¹ Associations d'Entreprises Adhérentes. Le terme anglo-saxon est très répandu et a donc été conservé

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List of Abbreviations

Board of Directors (BoD)	
Business Intelligence (BI)	
Business Intelligence Process (BIP)	
Business Member Organizations (BMOs)	
Business to Business (B2B)	
Chief Executive Officer (CEO)	
Critical Success factors (CSF)	
Decision Aiding Process (DAP)	
European Union (EU)	
Federation of Palestinian Chambers of Commerce and Industry (FPCCI)	
Federation of the Palestinian Pharmaceutical Industries (FPPI)	
General Assembly (GM)	
Gross Domestic Product (GDP)	
Information and Communication Sciences (ICS)	
International Standard Organization (ISO)	
Membership Based Organizations (BMOs)	
Micro, small and medium-sized enterprises (MSMEs)	
Ministry of National Economy (MoNE)	
Organization for Economic Co-operation and Development (OECD)	
Palestine Businessmen Associations (PBA)	
Palestine Federation of Industries (PFI)	
Palestine Federations of Chambers and Commerce, Industry and Agriculture (PFCCI)	

Palestine Food Industries Federation (PFIF)
Palestine Investment Promotion Agency (PIPA)
Palestine Standards Institutions (PSI)
Palestine Trade Centre (Pal trade)
Palestinian Central Bureau of Statistics (PCBS)
Palestinian National Authority (PNA)
Regional Committees (RC)
Small and Medium Enterprise (SME)
United Nation Industrial Ddevelopment Organization (UNIDO)
Union of Stone and Marble (USM)
World Trade Organization (WTO)

CHAPTER 1

INTRODUCTION

1.1 Introduction

This study attempts to investigate the informational and communicational role of Business Membership Organizations (BMOs). The research focuses on the role of the Union of Stone and Marble Industry in Palestine (USM) in fulfilling the information and intelligence needs of members SMEs. It aims to aid the decision makers at the USM decide upon the optimal Business Intelligence Process (BIP) model by employing a Decision Aiding Process (DAP) methodology. The first chapter starts with the research overview, followed by the research objectives, research problem, significance of the study, research methodology, and it concludes with the structure of the thesis.

1.2 The Research Overview

BMOs refer to chambers of commerce, or industrial federation with companies as members (Mikhnev, 2006:1). BMOs are non-government, non-for-profit organizations that represent and provide services to members against regular dues (Abu Yusufu, 2006). From his perspective, the researcher considers a BMO as: *“A non- for profit driven social entity with the purpose of providing designated services to members”*.

The world Bank conducted a worldwide study about the BMOs services worldwide, the result showed that BMOs play a vital role in the development of the Small and Medium Sized Enterprises (SMEs). The study concludes that BMOs have two main roles. From the one hand, they represent and defend the interest of their members. From the other hand, BMOs provide members with services to enhance their capabilities (Mikhnev, 2006:1). BMOs services include but not limited to business and professional information provision, quality upgrading, training and trade promotion (Wahl *et al.*,

2006:4). From their perspective, Majali (2013) and Yeow (2006) state that, information services are amongst the most important services that SMEs expect from the BMOs. Judy (2000) mentions some types of information services of BMOs. These types cover wide ranges of areas, such as: laws and legislations, foreign trade regulations, tariff and non-tariff barriers, importers and exporters, country profile, economic statistics and product standards.

This information services of the BMOs are crucial for the development of their member SMEs, as most of SMEs lack required capabilities to face surrounding challenges Kassim *et al.* (2016). These challenges include lack of qualified human resources, limited financial resources and business information. Quader& Abdullah (2009) ascertain that lack of information is a major marketing obstacle facing SMEs. Finally, it is worth mentioning that scarcity of information is a big challenge not only for SMEs in developing countries but for those in developed countries like Japan too (Yoshino& Taghizadeh-Hesary, 2016). These obstacles hinder SMEs from developing new technologies and penetrating new markets (OECD, 2004)

Therefore, responding to information needs of member SMEs is a main mission for BMOs. Obura& Matovu (2011) state that BMOs should set up tools and techniques to fulfil the information needs of SMEs through a well-designed information provision system. This system could be approached through the implementation of a Business Intelligence (BI) system. Many scholars support this argumentation that a BI system is applicable for both the profit and non-for profit or service organizations (Farrokhi, 2013; Khan, 2010).

BI is defined by many scholars as either a management approach, activity or information technology. (Hawking, 2013: 14; Vitt *et al.*, 2002) argue that BI is a management

approach that helps an organization to define relevant and useful information to their decision making. While, Howson argues that BI allows people at the organization access, analyse data to manage business efficiently, improve performance and detect opportunities Howson (2007: 2). From her perspective, Shollo's (2013: 26), synthesizes that BI concept varies from one dimensional to multi-dimensional definitions. For the one-dimensional definition; BI could be defined as a process, technology or product, while for the multi-dimensional one; it is a set of them together.

Meanwhile, BI is a complex system to implement as a significant investment is needed. Therefore, organizations should evaluate from the beginning their readiness to implement a BI system (Farrokhi, 2017; Hartley & Seymour, 2015). BI system implementation attracts the attention of several scholars who propose what they called BI readiness Critical Success Factors (CSFs). One of the most important definitions of CSF is that of Rocherat, who defines CSFs as: “the few key areas where the things must go right for the business to flourish” Rocherat (1997: 85). In the case of BI, Celina and Olszak (2010) define Business Intelligence CSF as: “A set of tasks and procedures that should be addressed in order to ensure BI system accomplishment.

Scholars mention several CSFs of the BI implementation in the for-profit organizations. For example, (Hawking, 2013) categorizes that BI implementation CSFs under several groups, such as: management support, adequate resources, champion, team skills, user participation, development technology and strategic alignment. From his perspective, Farrokhi (2017) classified the (BI) CSFs into two categories: organizational and technical. Organizational category includes: management support, organizational culture, decision making structure, goal alignment, managerial IT knowledge, management style, resource allocation, user participation, balanced and skilled project

team and agile project management. While, the technical category covers technical related aspects, such as: system quality, information quality, reliable back-end system, metadata management, technical frame work and agile methodology.

Based on that, the challenge is to determine the BI readiness CSFs and how to implement a BI system at a BMO. Therefore, this research attempts to fill this gap and to contribute the Palestinian context to both the body of knowledge and practice of the BI implementation at a BMO. This research investigates the informational and communicational role of The of the Union of Stone and Marble Industry in Palestine (USM) in fulfilling the information needs of the stone and marble SMEs in Palestine and the optimal form of implementing a BI system at the USM.

The USM is the largest industrial federation in Palestine. It is a non-for-profit membership-based organization established in 1996 to represent the stone and marble industry. Stone and marble industry is the largest industrial sector in Palestine representing 4.5% of the Gross Domestic Product (GDP). Some of the USM's main goals is to provide the stone and marble SMEs with business information and intelligence to help them take better decisions, taking in consideration the most stone and marble SMEs lack the resources and capabilities to meet these needs (Farra, 2009; USAID, 2006). These set of information include but not limited to marketing information, know-how and technology, financial and legislative information.

These are the stated information goals of the USM. The question here, whether, the USM carries out this mandate and meets the information needs of the USM or not. Based on his experience as the Chief Executive Officer (CEO) of the USM for more than ten years, the researcher ascertains that the USM underperforms its informational and communicational mandate. Currently, the information services of the USM is very

limited to the dissemination of the data and information that USM receives, to all members (one to many broadcasting mode). In other words, the USM neither plans for the relevant data collection, nor analyses them and communicates them in a professional way. The researcher ascertains that different members need different business information types, and that information should be provided to them in a proper manner to avoid over- or under-informing its members.

To conclude, the USM underperforms its informational and communicational role, due to the absence of a systematic method that enables the USM to define business information needs of member stone and marble SMES, collecting these data, analysing them and communication the value-added information and intelligence to specific members. Shortly, this information service deficiency could be argued to the absence of a proper BI system.

1.3 Research Objectives

This research aims to theoretically develop a set of CSFs of a BI implementation and empirically evaluate different forms of BI system proper for the USM. It aims to decide upon the optimal Business Information Process system for the USM to better respond to the information and intelligence needs of member stone and marble SMEs.

The specific objectives of this thesis are to:

1. Investigate the information needs of the stone and marble SMEs in Palestine.
2. Explore the types of business information services that the USM provides to its members.
3. Investigate the extent to which the USM information services meet the needs of member SMEs.
4. Develop a theoretical set of BI implementation CSFs for a case of a BMO.

5. Propose an optimal BI system for the USM that better supports the USM carrying out its informational and communicational mandate. This includes the optimal form of running each BIP tasks which are: identifying information needs, collecting relevant data, analysing the data, and communicating the business information and intelligence to member SMEs.

1.4 Research Problem

Farrokhi (2013) states that BI is applicable for both, profit and not for profit organizations, but without giving clarification of how may BI could be implemented or what are the critical success factors (CSFs) for BI readiness in the non for profit sector. From their perspective, Boselli *et al.*, (2015) acknowledge that the importance of the BI system in the for-profit organizations is obvious, they add that this topic was studied by many researchers, while, few researchers studied the BI role in non-for-profit sector. They found that BI adoption in the public sector is far behind the private one. The researcher acknowledges that the USM faces the same dilemma regarding the implementation of a proper BI system.

The researcher acknowledges that the USM underperforms its information services delivered to its members. This completely contradicts its stated mandate, where two out of its five major objectives are linked to the provision of business information to member SMEs (USM, 2007). Therefore, the researcher refers this deficiency to the absence of a well-designed system that enables the USM carries out the information services. Therefore, the problem of this research is to evaluate possible alternatives of Business Intelligence systems, and to propose the optimal one for the USM. These alternatives are linked to the USM ability to run the tasks of BI process alone, to completely outsource them, or the USM needs to collaborate with other bodies. To

perform the evaluation of the above-mentioned alternatives, the following section sheds light on the research methodology.

1.5 The Research Methodology

The previous section concludes that the USM has to implement a proper BI system to overcome its information services deficiency. To do so, the USM needs to decide upon the optimal form of carrying out each BIP tasks. This means that the USM faces a strategic and complex organizational problem that is needed to be solved. To find an optimal solution for this problem, the researcher ascertains that a formal research methodology should be employed as there are many decision makers at the UMS with several point of views. Moreover, such decision has an impact over hundreds of stone and marble SMEs. This point of view aligns with (Bouyssu *et al.*, 2006) who argue that in the organizational problem context a rigorous technique, where formal language and tools are used, rather than a heuristic and intuitive one is preferred.

Meanwhile, the researcher argues that the USM lack the resources, capabilities and experience to fix the problem that the USM faces. In other word, the USM decision makers ability to solve this problem is a questionable. Therefore, they need an external support from an analyst. This analyst should have the proper methodological techniques and tools to collect, process and analyse the data to develop a recommendation to solve this problem (Bouyssou *et al.*, 2006). This methodology is called the Decision Aiding Process (DAP). More specifically, an outranking methodology called *Promethee* is used to analyse different alternatives of how to carry out the BIP tasks. A review of related literature is conducted. In addition, a decisional Delphi technique, where decision makers from inside and outside the USM participate in a panel is followed.

1.6 The Structure of the Thesis

This research consists of seven chapters.

Chapter 1 is the introduction of the research, it includes the research overview, research objectives, research problem, methodology and research structure.

Chapter 2 presents the Palestine situation, it focuses on the Palestinian culture, Palestinian geography, demography and economy

Chapter 3 presents a review of the literature related to the French Concept of the Information and communication Science, the research main concepts, the Small and Medium Sized Enterprises (SMEs), the Business Membership Organizations (BMOs), and the Business Intelligence.

Chapter 4 provides an overview of the Union of Stone and Marble Industry in Palestine (USM), USM's mission, vision and objectives, its structure, role and the SWOT analyses of the USM.

Chapter 5 presents the research methodology, including the Decision Aiding Process (DAP). The decision aiding approaches, the problem situation, and problem.

Chapter 6 describes the evaluation model used to evaluate different alternatives, it includes, the alternatives, the evaluation criteria, criteria thresholds, preference functions and the performance table of each Business Intelligence Process (BIP) task.

Chapter 7 reports the main findings of the study, it proposes the recommendation to implement a BI system at the USM, and finally the recommendation regarding further researches.

CHAPTER 2

THE PALESTINIAN SITUATION

2.1 Introduction

This chapter presents the Palestinian situation, it starts with addressing the Palestinian national culture, then, the chapter illustrates the historical background of Palestine, followed by shedding light on the economy of Palestine, the Palestinian small and medium size enterprises (SMEs), the stone and marble sector, the stone and marble SMEs supporting organisations.

The aim of this chapter is to contribute to identifying the challenges and parameters for this doctoral work concerning the role of the *Union of Stone and Marble (USM) Industry in Palestine* in fulfilling the information and intelligence needs of the members' enterprises by adapting the appropriate *Business Intelligence (BI)* model through the support of the *Decision Aiding Process (DAP)*.

2.2 The Palestinian National Culture

This section considers the Palestinian culture as an important introductory to understand and analyse the Palestinian situation. The researcher employees the following two important models to perform this mission.

- Geert Hofstede's (2010) tool on "the national cultural model"
- Alex Mucchielli's (1999) tool on a "situation" as a superposition of contexts,

The following subsections consider each of the model in details.

2.2.1 The National Cultural Model of Geert Hofstede

The researcher employees The National Cultural Model of Geert Hofstede, a famous researcher in the intercultural field, to analyse the Palestinian culture. This model allows

the analyses of a national culture of a specific nation, in addition, it allows establishing a comparison of two different nations culture. This model was developed as a result of extensive research projects over tens of companies in more than seventy countries¹. The national culture model is used to distinguish nations rather than individuals; this model consists of six dimensions:

- Power Distance (large versus small).
- Individualism versus Collectivism.
- Masculinity versus Femininity.
- Uncertainty Avoidance (strong versus weak).
- Long term orientation versus short term normative orientation
- Indulgence versus restraint

Given that there is no data about Palestine on the Hofstede data base, the researcher takes Jordan as being the closest cultural case to Palestine, in order to help understand the Palestinian context, the researcher considers the following figure illustrates the national cultural dimensions of Jordan as found on the Hofstede database:

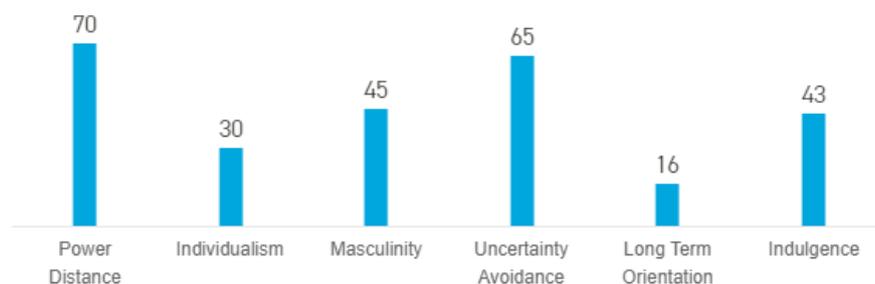


Figure 2.1. Hofstede's Cultural Insight of Jordan²

¹ <https://www.hofstede-insights.com/models/>

² <https://www.hofstede-insights.com/country-comparison/jordan/>

In the following subsections, the researcher analyses the Palestinian national culture according to the above-mentioned dimensions as follows:

2.2.1.1 The Power Distance

According to Hofstede (2005), this dimension expresses the degree that people expect and accept that power is distributed unequally. Figure 1.1, shows that Jordanians appear to show large power distance. Consequently, this means that Palestinians are considered to have high power distance degree. This illustrates that Palestinians are categorized into classes and people accept hierarchical order where everyone accepts his place without justification. These analyses align with the result of Jaber (2015), she states that Palestinians show large power distance degree, this is applicable in the family, where youngers have to obey and respect their relatives and the elderly. She argues that this is valid in the workplace too, where people tend to treat each other according to their positions. Being as a Palestinian, lives and works in Palestine, the researcher supports this result and acknowledges that Palestinians accept the distribution of power in the society, family, education system and workplace. For example, from a social perspective, power is seen as a source of a social status. At workplace, as most enterprises in Palestine are family business, the researcher ascertains that owners who are the managers at the same time, always monopolize the decisions that should be obeyed and respected from the employees without asking about further justifications.

2.2.1.2 Individualism versus Collectivism

In this dimension, the high side represents the individualism, while, the bottom side represents the collectivism. In individualistic societies, the term “I” is dominant and people tend to take care of themselves and the direct family, On the other hand, in the collectivistic societies, the term “We” is dominant and people belong to “in group” that are supposed to look after them in exchange for loyalty (Hofstede, 2005). With low

score of 30, Jordan and thus Palestine, is considered a collectivistic society that fosters strong relationships, where everyone takes responsibilities for fellow members in their group. The researcher agrees with this indicator, he ascertains that the Palestinian society is shaped with strong social relations, at which “We” rather than “I” is dominant, people take care for large group, rather than their direct families. This analysis complies with the result of Jaber (2015), who argues that Palestine is a collectivistic society, she gives marriage as an example to illustrates that. Marriage is not only a social linkage between two individuals, rather, it forms a strong relationship between their big families. It is also aligned with Amleh (2014), who states that a Palestinian individual tend to have strong commitment to not only his own family, but also to his nation in general, keeping in mind the socio-political situation in Palestine, which imposes social responsibility on the shoulders of individuals.

2.2.1.3 Masculinity versus Femininity

In Masculine society (high score), the preference is for the achievement, material reward for success and heroism. On the contrary, the Feminine society (low score) represents the modesty, cooperation and taking care of others. In business context, masculinity is articulated to toughness, on the opposite, femininity points to softness and flexibility (Hofstede, 2005), and human welfare (Amleh, 2014). The figure points that Jordan has a moderately score, with 45 points, this means that it is a feminine society where people like flexibility and solidarity, incentives and free time flexibility are favoured, and conflicts always are resolved through compromising and negotiations, rather than following legal methods. From their perspective Amleh (2014) and Jaber (2015), both researcher states that Palestine is considered a masculine society, the male dominates the top positions and are more employed and paid. In the contrary, the unemployment rate amongst women is high, and women always have social

discrimination. The researcher stands with the opinions of Jaber (2015) and Amleh (2014), and therefore, he does not agree with the result of the Hofstede (2005) study. From his experience, the researcher ascertains that the work places is more aggressive, achievement articulated and is considered a tough environment in terms of workers' rights and incentives.

2.2.1.4 Uncertainty Avoidance (strong versus weak)

With a moderate 65 score, the Jordanian society preference is to avoid uncertainty due to the rigid beliefs and intolerance environment (Hofstede, 2005). The researcher agrees with this result, he ascertains that Palestinians tend to avoid uncertainty especially at work places where, the entrepreneurship is restrained. Because the workers lack the decision power, which is concentrated at the hand of the business owners, in addition, intolerance is the dominant at workplace, as just stated above. This point of view is supported to some extent with the result of Jaber (2015), who states that the Palestinian society shows high degree of uncertainty avoidance.

2.2.1.5 Long term orientation versus short term normative orientation

Long term-oriented societies tend to be flexible and pragmatic to deal with changes in order to achieve long run objectives. On the opposite, short term societies are normative in nature, conservative, pay attentions to norms, values and tradition and normally looks for quick results (Hofstede, 2005; Amleh, 2014). With very low score in this dimension, Jordanian society exhibits that it is a very normative and conservative society, people tend to articulate to values and tradition. This result completely conforms the analyses of both Jaber (2015) and Amleh (2014) who states that the Palestinian society like all Arab and Muslim societies are very conservatives and traditional. The researcher supports these points of views that Palestinian are very conservatives, where religion

and traditions control to some extent the behaviour of people. From his experience, the researcher believes that this conservatism considers a major obstacle that prohibits developing different aspects of the society. As an example, the employees at work place always resist development initiatives and tend to stuck to their working routine, the result of this dimension might be linked to the uncertainty avoidance that just explained above.

2.2.1.6 Indulgence versus restraint

This dimension evaluates the extent to which a society control their desires and impulses. An indulgence society exhibits weak control over human impulses and permits relatively free gratification of basic and natural human drives related to enjoying life. On the opposite, Restraint society has a strong control that constrains basic human drives to enjoying life and having fun (Hofstede, 2005). The figure 1.1 illustrates that Jordan exhibits low degree in this dimension; therefore, it is considered a restraint society. So, following our proposition to compare Palestine with Jordan, Palestine also could be considered a restrains society too. Furthermore, the researcher believes that Palestine in more restrained society due to the socio-politic situation that Palestinians face, this environment does not allow people to freely enjoy life and having fun. Such conditions even have the impact over different sectors of the society, including the working environment.

2.2.2 The “Situation” as a superposition of contexts of Alex Mucchielli

The conceptual rationale of this section is based on the concept of “situation” as introduced by Alex Mucchielli (1999). According to Mucchielli (1999: 26), an informational-communication situation is constituted of a dynamic “superposition of contexts”, namely that of *Reference points, Identities, Roles, and Interactions*.

First, the context of Reference points establishes the (culturally) “acceptable” way that actors can evaluate and act in a given situation (Mucchielli, 1999: 107-110, 160-164). Typically, a reference points involves establishing priorities relating to preferences in a situation. Next, the context of Identities involves the intentions, plans, stakes and system of values that actors engage in a given situation (Mucchielli, 1999: 139-141, 164). This contributes to establishing in terms of what attributes individuals can be recognised as belonging, or not, to a group. A social actor has a set of identities (such as professional, cultural, familial, and ideological). The identities can be conflicting. For example, depending on the dominant identity/ies actors will selectively reveal/conceal what they expect to gain/ loss in a situation.

Then, the context of actors’ roles is linked to the way in which the obligations and rights – attributed to a “role” – guide the expected/prescribed actions of actors (Mucchielli, 1999: 49-51, 164). An actor has several roles (professional, cultural, familial, and ideological). These roles can impact on how individuals interpret the range and the importance of their different “roles” in a given situation. This can lead to conflict between roles, just as it can reinforce different roles.

Finally, the context of actors’ interactions involves the level of trust and confidence, and type of relationships (adversarial, cooperative, neutral, ...) among actors in a situation (Mucchielli 1999: 75-76, 164). Different interactions can be ambivalent and volatile, if not undetermined.

From this perspective, a situation is thus how the different contexts are superposed. The superposition involves hierarchizing, and relative “weighting” of, the four contexts in terms of each other. For example, in a more communication-focused situation the context of “Interaction” followed by “identities” can be dominant, in another, more

normative-focused, situation the context of “Reference points” followed by “Roles” (expected behaviour) is likely to be dominant. If the contexts are modified, the meaning ascribed to things are accordingly modified. Examining the modifications is thus one of the keys when analysing the “communication process” (Mucchielli (1999: 45).

Considering these four attributes of Mucchielli, the researcher argues that the Palestinian reference points that define their priorities are rooted in their national culture toward the liberation and self-determination rights. This could be argued due to the absence of internationally recognized Palestinian independent state. This national orientated culture might be considered the main motivators of the Palestinians to define their identities through formulating different plans and strategies toward building their independent state, which proceed any priority at the national level.

The researcher believes that every Palestinian regardless of his position has a role that should be played to reach the independence goal. For, example, at the National level, The Palestinian National Authority (PNA) aims to build the potential state’s institutions and to take the lead in enhancing economic development toward a prosperous life for the Palestinian people. The PNA motivates the Palestinians to take role towards achieving this most important goal.

Finally, the interactions between Palestinians are diversified according to the context. For example, the cultural relations are strong as Palestinian society is considered as a collectivistic society, where People mostly has strong social relations and cooperative relations which lead them carry out different types of social responsibilities toward a wide circle of people around, and not just close family. These analyses align with the result of (Hofstede, 2010; Jaber, 2015; Amleh, 2014). On the contrary, the researcher acknowledges that the interactions at work places is completely different, because, the

businesses in Palestine are mostly owned and managed by family style management where the decisions of the owners should be obeyed so that the workers almost face what the researcher might call it a dictator relationship. This point of view, to some extent is supported by Hofstede analyses that Jordanians and so the Palestinians accept the high hierarchy and long power distance as described before.

2.3 Palestine, Geography, Historical and Political Background

Palestine has a unique geographical location. It is situated in the Middle East at a convergence point of Asia, Africa and Europe. It is a small country with an area of 6020 square kilometre, which is only two third of the area of Corsica; which is 8,680 square kilometres¹. According to the *Palestinian Central Bureau of Statistics* (PCBS), Palestine consists of two parts: The West Bank of a land of **5655** square kilometres and The Gaza Strip of a land of **365** square kilometres. The current population of Palestine is **4,854,013**, from which, **2,921,170** in The West Bank and **1,932,843** in Gaza strip. The population density is **806** capita per square kilometre (PCBS: 2018).

From a historical point of view, Jericho in Palestine is the oldest place that had been inhabited in the world (Benjamin: 2017). Many civilizations lived in Palestine during different ages, their heritages and archaeologies still exist in Jerusalem, Bethlehem and Hebron as examples. In the nineteenth century, The British captured Palestine from the Ottomans after World War I, the British mandate on Palestine started on 1922 until 1947. Then, in 1984 Israel declared at 78% of the land (Lillian Goldman Law Library: 2008).

The remaining territories are the West Bank and The Gaza Strip. While, The West Bank had merged with Jordan as a part of the Kingdom of Jordan, The Gaza strip was under

¹ www.corse.fr

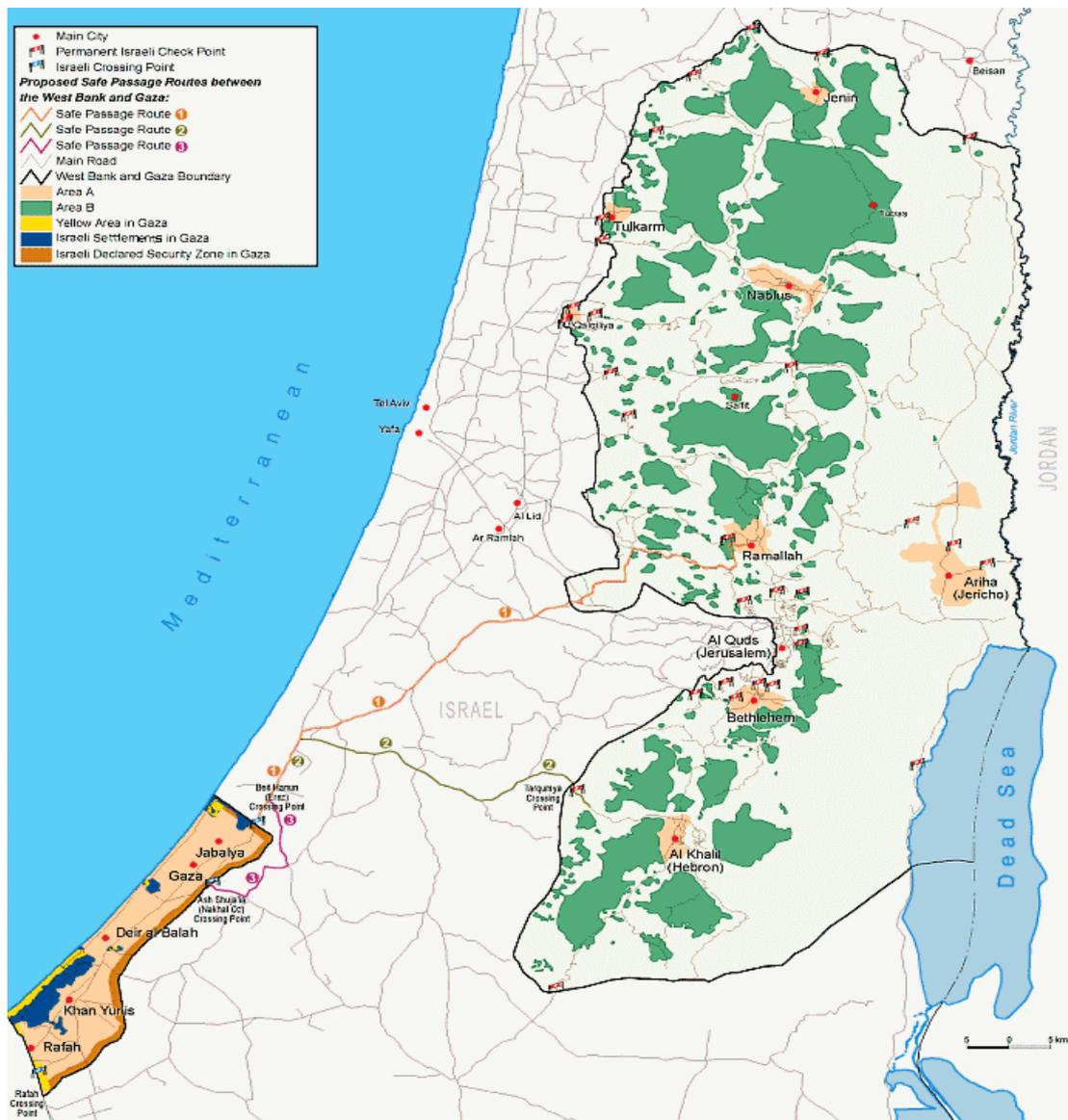
the Egyptian Administration (Encyclopaedia, 2016). After the 1967 War between Arabs and Israel, Israel had occupied both The West Bank and The Gaza strip. which remained under the Israeli full control until signing the Oslo Peace Agreement between Israel and the *Palestinian Liberation Organization* (PLO) in 1993 (Office of The Historian, The Oslo Accords and the Arab Israeli Peace Process). Based on the Oslo Peace Accords, The *Palestinian National Authority* (PNA) was established as a temporary government to manage the Palestinians civilian affairs and administrative issues. More importantly, the Palestinian territories were categorized into three categories: A, B and C as shown in the following table:

Table 2.1 *The categorization of the Palestinian Land of the West Bank According to Oslo Agreement, source: (B'Tselem, 2014).*

Area	Security Issues	Civil Administration	% of West Bank land	% of Palestinians living in the area
A	Palestinian	Palestinian	18%	55%
B	Israeli	Palestinian	21%	41%
C	Israeli	Israeli	61%	4%

According to *The Israeli Information Centre for Human Rights in the Occupied Territories (B'Tselem)*, the OSLO agreement Categorises the Palestinian lands as follows: First, in area A, the Palestinian National Authority has a full control of both civilian and security issues, this area forms 18% of the land. Area B composes 21% of the land, in this area, Israel controls the security issues, while the PNA controls the civilian issues. On the contrary, Israel controls both the civilian and the security issues in Area C, which shapes 61% of the West Bank, this means that Palestinians are not allowed to conduct any urban or economical activities without getting permission from

the Israeli Authority (*B'Tselem, 2014*). The following map shows the categorization of the Palestinian lands in addition to the locations of the Israeli settlements on West Bank.



Map 2.1 Palestinian territories (Head office of USM in Bethlehem indicated with an arrow). Source: (*B'Tselem, 2014*).

Based on the Oslo Agreement, in 1994, Israel withdrew from the principal cities in the West Bank and the Gaza Strip. Then, the final solution negotiations started between both sides. It was expected to establish a Palestinian state within less than five years to reach a final solution to the conflict. But unfortunately, the negotiation between both sides faced many struggles and failed to reach the expected the final solution.

As a result of this failure, new realities were established on ground and dozens of illegal Israeli settlements have been constructed in the Palestinian Territories¹. This complicated the situation and put the two-state solution in a logjam as stated by the United Nations, Security Council Resolution No. 2334, 2016).

2.4 The Palestinian Economy

It is worth noting that Palestine has a unique situation due to this special historical context. The United Nations Conference on Trade and Development (UNCTAD), states that, since 1967, Israel has launched numerous programmed policies and procedures to tie the Palestinian economy entirely with Israel. (UNCTAD, 2009). As a result of these policies and procedures the Palestinian market was turned into a market for Israeli products, and a main resource of cheap labour for the Israeli economy. According to Arnon, & Weinblatt, (2001), The Paris Protocol, which is a complementary protocol to the Oslo agreement aimed to regulate the economic affairs between Israel and the PNA formalized the (de facto) customs union to be operated under Israeli control, rather than to open the door for the independence of the Palestinian economy (UNCTAD, 2009). As a consequence of the failure to reach a final peace agreement, the Palestinian economy still suffers from the dependency on the Israeli economy. It is worth mentioning that all Palestinian imports and exports transactions including control, customs and clearance operations are in the hands of Israel. This limits the Palestinians foreign trade with the international markets (UNCTAD, 2012).

After this important introduction about the special case of Palestine, the next section presents the figures about the Palestinian main economic figures and economic sectors.

¹ <https://history.state.gov/milestones/1993-2000/oslo>

2.4.1 Palestine Economic Indicators

According to the Palestinian Central Bureau of Statistics, the GDP of Palestine is USD 7463.4 million, and the GDP per capita is USD 1737. The unemployment rate is 25.9%. The total exports are 944 million \$USD, while the imports are USD 5683 million, which means a trade balance of USD -4739 million. Palestine major trade partners for exports are: Israel with USD 792 million, Arab countries with USD 113 million and other countries with USD 39 million. In contrast, the main import partners are also Israel with import values USD 3958 million, followed by the European Countries with USD 581 million, then, the Arab countries with USD 274 million, countries in the Americas with USD 95 million and others with USD 775 million of exports (PCBS, 2016).

The Palestinian Economy is a diversified one. The major contributor sectors to the Gross Domestic Product (GDP) are respectively: the service sector represents 20.6%. The wholesale and retail trade sector represents 17.3%. The Mining, manufacturing, electricity and water comes at the third level with 14.5% (Palestinian Investment Promotion Agency, 2014):

Table 2.2 *Percentage contribution of GDP in Palestine (PIPA, 2014)*

Economic Activity	Contribution rate
Agriculture, forestry and fishing	3.8
Mining, manufacturing, electricity and water	14.5
Construction	7.2
Wholesale and retail trade, repair of motor vehicles and motorcycles	17.3
Transportation and storage	1.6
Financial and insurance activities	3.7
Information and communication	5.8
Services	20.6
Public administration and defence	13
Households with employed persons	0.1
Other Activity	12.4
GDP	100

As shown in table 1.2, mining, manufacturing, electricity and water sector represents an important component of the Palestinian GDP, among which, stone and marble sector represents 25% of the whole industry volume which is equal to 4.5 of the GDP (USM, 2011).

2.4.2 The Small and Medium Sized Enterprises in Palestine

As in almost all other economies, *Small and Medium Sized Enterprises* (SMEs) in Palestine are the main drivers of the economy. The definition of SME varies from one country to another, and it depends on several criteria, such as number of employees, annual turnover, the invested capital from the quantitative perspective, and management style, cultural factors and decision power from the qualitative point of view, the concept of the SMEs from both approach is discussed in the next chapter. In all cases, the definitions of the SME's aim to differentiate them from large enterprises. In Palestine, The Palestine Central Bureau of statistics (PCBS, 2001) adopts a quantitative approach, where the number of employees is the differentiation criteria to categorises the enterprises into: micro, small, medium and large as follows:

Table 2.3 *The categorisation of the SMEs in Palestine according to the Palestine Central Bureau of statistics*

Micro	Small	Medium	large
1-4 employees	5-19 employees	20-49 employees	More than 50 employees

In 2011, the Palestinian government adopts also a three criteria quantitative approach for the classification of the enterprises, those criteria are: the number of employees, the annual turnover and the invested capital, (Palestine Cabinet Decision No.1/105/13, 2013), the table below displays this categorization.

Table 2.4 *The categorisation of the SMEs in Palestine according to (Palestine Cabinet Decision No.1/105/13, 2013).*

Size	No. of employees	Annual turnover	Investment capital
		In USD	In USD
Micro	1-4	20000	5000
Small	5-9	20001-200000	5001-50000
Medium	10-19	200001-500000	50001-100000
Large	More than 20	More than 500000	More than 100000

Based on either definition, in Palestine, the SMEs represent more than 90% of the whole economy (PCBS, 2012). Which makes this sector the back bone of the Palestinian economy, taking in consideration the socio economical role it plays in terms of employment generation, income distribution, poverty reduction, rural development and stability of family income (Sous, 2005). Meanwhile, SMEs in Palestine have many weaknesses and obstacles such as: resistance to change, decision dilemma, conflict between different generations, and the liquidation or partition. (Sabri, 2010). This align with the analyses of Hofstede (2005) mentioned before as Palestinians show acceptance to power distance, which makes the decisions on the hand of the owners of the enterprises, also this conforms with the result the Palestinians tend to avoid uncertainty and consequently, the resist the change. In the following section, the researcher considers the stone and marble industry as the most important industrial sector in Palestine.

2.5 The Stone and Marble Industry

In the following section, we illustrate the stone and marble sector's main indicators, types of the industries, main products, technology and knowhow, marketing performances, employment, analysis of the sector main needs and SWOT analysis of the sector.

At the beginning, it is worth mentioning that stone and marble enterprises in Palestine are a clear example of the SMEs. On the one hand, the stone and marble SMEs represent more than 90% of the whole enterprises in the sector, on the other hand, they are traditional family business that show similar characteristic to major SMEs from other sectors in Palestine (Abu Hanieh *et al.*, 2013).

Stone and Marble industry is an ancestral industry in Palestine. The sector played a prominent role in Palestinians life and economy. Stone and marble industry is clearly shown in the Dome of the Rock in Jerusalem and in the Church of Nativity in Bethlehem (USM, 2011). In the contemporary era the industry started in the beginning of 1930s, all activities were done by hand, until late 1960 when the entrepreneurs had started using semi-automated machines. It is a pure family business where the experience handed down from one generation to another (USM, 2011). According to a study conducted by the *United States International Development Agency (USAID)*, in 2002, the stone and marble sector constituted approximately 4% of world production, placing Palestine in the twelfth place among the world's producers (Stone Cluster Competitiveness Report, USAID: 2006). Currently, the stone and marble industry is considered as the backbone of the industrial sector in Palestine. It contributes 4.5% of the national GDP, it generates more than 20000 employment positions, it contributes to one third of the Palestine exports. The sector is not only significant within local standards but also globally.

Currently, the Palestinian stone and marble products are exported to more than seventy countries worldwide (MAS, 2018)

This makes the stone and marble industry as the most important productive sector in Palestine (PCBS, 2014). Furthermore, it contributes approximately 25% to Palestine's overall industrial revenue. In addition, the total investment in the industry is estimated around USD700 million, which has been found to be a major employer of the Palestinian capital. Finally, at a rough estimate, the industry has USD 30 Billions value of reserves of raw material (USM, 2011), and approximately USD 400 million of sales per annum (Pal trade, 2019).

Due to this socio-economic importance, the stone and marble sector was selected by both private and public sector organizations as the most important industrial sector in Palestine, and thus was chosen as a priority sector during the development of the National Export strategy (Paltrade, 2014: 3).

2.5.1 The Type of Enterprises

According to the USM classification, stone and marble enterprises fall into one of the following four types: quarries, stone cutting factories, crushers and micro workshops (PSMC, 2018). Their numbers and percentages are shown in the following figure:

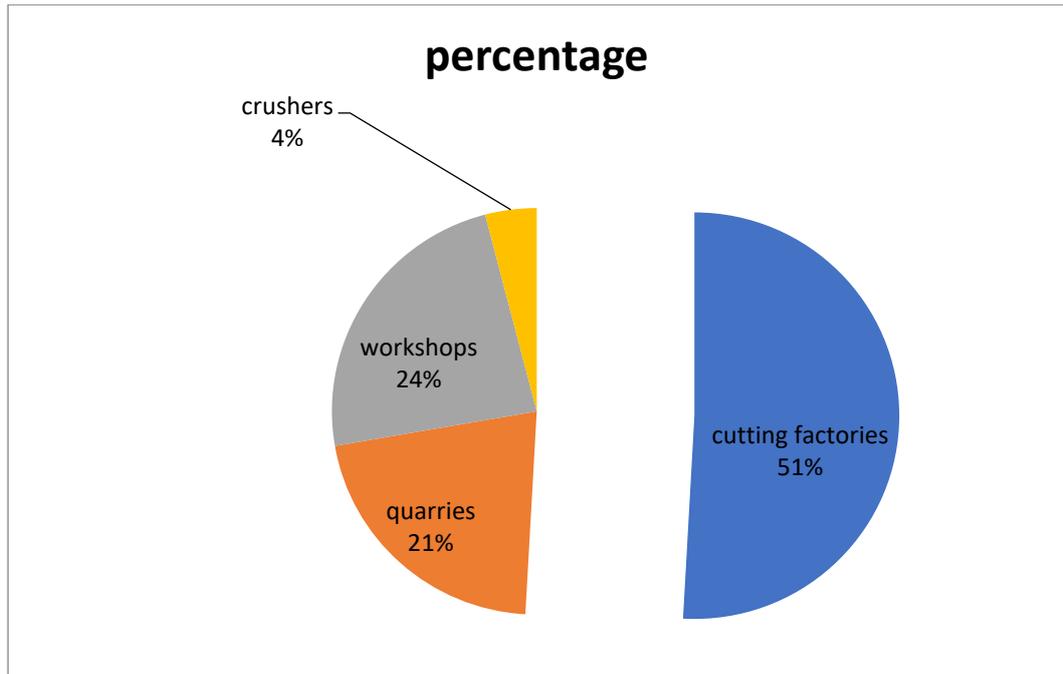


Figure 2.2. Stone and marble enterprises types (PSMC, 2018)

These types and numbers are explained in the following way:

- Quarry: A stone quarry: Is a place from which the raw material called blocks is excavated, then sent to the stone cutting factories. A Stone block is an un-cut stone, as extracted from the quarries in the form of cubes. The quarries number in Palestine is 253 quarries.
- Stone cutting factories: the industrial plants where the raw material; stone blocks are transformed into finished or semi-finished products. Currently there are 602 processing factories.
- Crushers: where the raw material and the solid waste of the cutting factories are transformed into gravel at different scales There are 75 crushers in Palestine (PFCI, 2018).
- Micro workshops: an enterprise works at a small scale usually with one to three workers. There are 289 workshops.

This thesis examines the stone cutting factories, due to the fact that these factories are the primary entities that transform the raw material into finished or semi-finished products, which are then sold to the local and international markets. The quarries and crushers sell their products to the local market. Exportation of un-cut blocks to overseas markets is restricted in order to increase the maximum “value added” within Palestine (Paltrade, 2012).

2.5.2 Stone and Marble Products

Stone and marble major products descriptions and quantities (PSMC, 2014) are as follows:

- Stone blocks: are the raw materials extracted from the quarries.
- Building stones: cut to size according to the client’s demand, when blocks cut down into 3-8 cm thickness with specific length and width in factories for use in construction cladding interior and exterior.
- Slabs & tiles: blocks cut with multi-blade saws into strips of 1-2 cm for tiles and 3-4 cm for slabs, which are then put through polishing and finishing lines to enhance the quality and appearance of the stone.
- Customized stone: products cut to size and shape for decorative or ornamental uses, e.g. tombstones, counter-tops

The total annual production of finished building stones and semi-finished slabs is about 15 million square meters (MAS, 2018).

2.5.3 Marketing Performance of The Stone and Marble companies

Palestinian stone and marble producers sell their products in different markets. The composition of the market is classified as: 65% for Israel, 20% for the local market in the West Bank and 15% for export to other countries. Competition among local

producers is tough as well as in the international market; in particular, with producers from countries where the production cost is lower compared to Palestine; such as Jordan, India, China Egypt and Turkey (MAS, 2018).

In spite of this competition, Palestinian stone and marble products are exported to tens of countries, according to the figures of the Palestinian Ministry of National Economy, the Palestinian stone products have been exported to more than seventy countries all over the world (MoNE, 2017). This success is as a result of the big efforts done by the pioneer Palestinian businessmen who succeeded in building a global brand image at the international market, such as the well-known brand “Jerusalem Stone” (Palestine Stone Cluster, 2016).

Meanwhile, this good performance in the international markets is limited to few stone companies, while the majority of the SMEs sell their products to the local market (USM, 2018). The researcher returns this to the capabilities and resources of the stone and marble enterprises. While, the large enterprises have the financial and human capabilities and experience which enable them to penetrate the international markets. On the contrary, the majority of stone SMEs lack such resources and capabilities, in particular, the marketing capabilities that enable them to gather and process information about potential markets such as quality requirements which are crucial to penetrate the international market (Palestine Trade Centre, 2014). This diagnosis aligns with the report of the Organization for *Economic Co-operation and Development (OECD)* regarding the barriers of SMEs to access to international markets. This report considers the information barriers such as: identifying the source of data, data reliability, and communication difficulties in reaching overseas clients amongst the most important barriers that limits SMEs access to the international markets (OECD, 2018).

2.5.4 Employment

The Palestinian stone and marble industry is a major source of employment in Palestine. This industry offers direct jobs to more than twenty thousands workers and employees (MAS, 2018). The workers in the industry can be classified into three categories (administrative, skilled and unskilled workers). The annual average wage is approximately USD 6000 per year for unskilled workers, this is the highest wage paid to unskilled labores compared to other sectors in Palestine (Abu Hanieh, et al., 2013). More than 99% of the workers in the sector are males (PSMC, 2014), this result conforms the analyses of Gofstede (2005), when he described the Jordanian soicey as a masculine socity. The resaercher might refers tthis to the toughness of the working environment, in addition to the culture that prohibits the women from working in a tradionally masculine dominated environment.

2.5.5 Technology and Know How

The sector mainly depends on foreign technology. According to USM's annual activity report (USM, 2018), only few members, participate in the international fairs and business to business (B2B) meetings. Such events offer good opportunities for networking, promotion, and checking the most advanced technologies and production lines. Currently, the researcher ascertains that no informational newsletters are disseminated to stone and marble SMEs to compensate visiting the stone fairs. Neither the USM, no other organizations carry out this mission. Therefore, most stone and marble SMEs lack the information about the technology and know-how, international market trends and other relevant information.

This contradicts with the USM's mandate of being a business information provider to the member SMEs. From his experience, the researcher refers that to the lack of

capabilities and resources of USM in addition to weak support of the top management, as top managers perceive the provision of business information services as secondary services.

Therefore, the researcher ascertains that stone and marble SMEs should be better informed about the advancements in the technology and knowhow, production lines, product quality and potential markets to support them taking better decisions to develop their enterprises, and to comply with product quality and specifications to penetrate to the international markets. Therefore, the challenge that stone and marble SMEs face is how to fill this information gap, keeping in mind that they lack the resources and capabilities to carry this mission by their own efforts.

In the following section, we study the institutional environment that supports the stone and marble SMEs, this includes relevant public and private organization.

2.6 Supporting Organizations

A number of public and private sector bodies offer services and support to the industrial sector in Palestine. Some of these organizations are governmental bodies; like the *Ministry of National Economy (MoNE)*, *Palestine Standards Institutions (PSI)* and *Palestine Investment Promotion Agency (PIPA)*. In contrast, others are private nongovernmental, and mostly, not for profit membership based organizations such as: *The Union of Stone and Marble Industry in Palestine (USM)*, *Palestine Federation of Industries (PFI)*, *Palestine Trade Center (Paltrade)*, *Palestine Federations of Chambers and Commerce, Industry and Agriculture (PFCCI)* and the local chambers of commerce and industry, and *Palestine Businessmen Associations*. The following sections observes each of those organizations and describe their roles and mandates from an informational services point of view.

2.6.1 The Public Organizations

In Palestine, many ministries and public agencies support and offer the services to the private sector enterprises, these include but not limited to the *Ministry of National Economy* (MoNE), *Palestine Investment Promotion Agency* (PIPA), and *Palestine Standards Institution* (PSI). The following subsections describe these agencies, their mandates, roles and services to private sector enterprises and the stone and marble enterprises in particular.

2.6.1.1 The Ministry of The National Economy

Ministry of National Economy (MoNE) was established in 1994. According to Palestinian cabinet decree no. 229 for the year 2004, MoNE is delegated the responsibility to follow up and supervise the economic sector in Palestine. MoNE develops the economic policies and plans toward the development of the Palestinian economy for the prosperity of the Palestinian people. MoNE has four main objectives¹, they are:

- Building an independent economy, not linked with the Israeli economy
- enhancing the attractive business environment
- enhancing the competitiveness of the Palestinian products, and
- developing the legislations to support the economic development in Palestine.

MoNE is considered the governmental umbrella of the business enterprises, it provides several services such as: giving permits to operate the industrial enterprises, facilitate the import and export transactions, controlling the trademarks and intellectual properties issues, and developing the trade agreements with other countries.

¹ www.mone.gov.ps

MoNE informational role is mainly limited to some publications at the website of the ministry, while, neither, informational bulletins are published, nor, informational workshops are organized to and from the business community about relevant important issues.

2.6.1.2 The Palestine Standards Institution

The Palestine Standards Institution (PSI) was established in 1996 to serve both the business community and to protect the consumers, both locally and internationally. PSI is the focal point for Palestinian participation in the global system of harmonized standards. The PSI's mission is to facilitate trade and investment in Palestine by meeting the metrology, standards, testing and quality related needs of the business community while ensuring consumer and environmental safety. The PSI is a member of AIDMO (Arab Regional Standards Body) and became a subscriber member of the *International Standard Organization (ISO)* in 2001 and a correspondent member in 2004.

The PSI engagement with the Palestinian stone industries appears in three main functions. First, the development of Palestinian Natural Stone Standards in collaboration with USM and some stone leading companies. Second, by accrediting some local testing laboratories where most technical tests for technical properties of the products can be performed. Finally, issuing the quality label for products. These engagements are necessary quality infrastructure needed to develop local products in addition to facilitating the mission of Palestinian exports, since, almost all international buyers request samples testing results. Despite the importance of those engagements of PSI, it is important to mention that the cooperation with USM is not sufficient (Paltrade, 2014). The researcher considers that the informational role of the PSI as

underperforming as no newsletters or reports are disseminated to the industrial community.

2.6.1.3 The Palestine Investment Promotion Agency

The Palestine Investment Promotion Agency (PIPA) was established in 1998 based on the issuance of the Investment Promotion Act in Palestine (Palestine Legislative Council, 1998). According to that, the PIPA aims to promote both local and foreign investments in Palestine. To achieve its goals, PIPA offers income tax free incentives based on the invested capital, and employment generation of the invested projects. From the informational points of view, PIPA's main mandate is to be a hub of business information about investment opportunities and doing business in Palestine. Based on his experience, the researcher considers that PIPA information services as being limited to some workshops and an investment conference every several years. In, the case of the relation with USM, the researcher states that only one workshop has been organised in previous several years.

2.6.2 The Private Sector Organizations

In Palestine, like many other countries, there are several types of business organizations, some of these organizations are territorially organized like chambers of commerce and industry, while some others are sector organizations with homogeneous memberships representing specific industries such as industrial federations. These organizations are created to support the private sector enterprises and to play a vital role in the development of the SMEs including the stone and marble sector (Berzeit University, 2017). In the following sections, the researcher based on his own experience, analyses the information services of the Palestinian Federation of Industries (PFI), The Palestinian Federation of Chambers of Commerce and industry (PFCCI), Palestine

Trade Centre (Paltrade), and the Union of Stone and Marble Industry in Palestine (USM).

2.6.2.1 The Palestinian Federation of Industries

The Palestinian Federation of Industries (PFI) is a membership-based organization, it was established in 1996 as an umbrella to all industrial sectors. Currently, PFI encompasses sixteen industrial federations, such as the Union of Stone and Marble Industry, Palestinian Food and Beverages Federation, Federation of Construction Industries, Federation of Pharmaceuticals Industries and others. PFI's main mandates are: to present member federations, to define their interests, to build their capabilities, to take the lead regarding the formulation of legislation related to industrial development, and to implement industrial development projects for the sake of the enhancement of the competitiveness of the industrial sectors in Palestine (Sabri, *et al.*, 2010).

From the informational services point of view, the researcher, based on his experience considers PFI as a main source of business information, it provides member federations with almost daily materials, regarding different topics, such as: international fairs, laws and legislations, capacity building programs, and other needed information. From their side, each industrial federation communicates relevant data to their members. Even though, the researcher claims that the PFI lacks the financial and human resources that enable it to develop significant value-added information reports. Usually, the PFI disseminates the information it receives as it is, without any analyses in order to create an added value.

2.6.2.2 The Federation of Palestinian Chambers of Commerce and Industry

The Federation of Palestinian Chambers of Commerce and Industry (FPCCI) was established in 1999 in Jerusalem. The FPCCI is the umbrella of the Palestinian chambers of commerce and industry. Its main task is to build the capacity of member chambers to be able to cope with the requirements of the global business environment. In addition, the organisation, has an integral part in policy formulation at the national level¹.

The FPCCI shares information with its chambers, then, they forward the information to their member enterprises. In the case of stone industries, the researcher can but note that The FPCCI does not share information bulletins, newsletters or emails directly with USM, and only few stone SMEs are registered with the chambers in order to benefit from information services and those are very limited in numbers (USM, 2019) in the membership directory. Furthermore, as a multi sectoral organisation, the FPCCI does not offer a tailored information service to stone and marble sector. In other words, it has low level of impact to respond to the stone sector needs (Pal trade, 2014).

2.6.2.3 The Palestine Trade Centre

Palestine Trade Centre's mandate is to lead the development of Palestinian trade as a driving force for sustainable national economic growth, it was established to support the Palestinian exporters through export promotional activities such as participation in international and regional fairs. In addition, the Paltrade offers capacity building programs and consultation to member companies (Sabri, *et al.*, 2010). One of the main mandates of the Paltrade is to be a source of market intelligence and business information about potential markets (paltrade website). From his perspective, the

¹ <http://www.pal-chambers.org/en-us/>

researcher argues that Paltrade could be considered as a significant source of information about international markets, nevertheless he criticizes its role, as an information service, it is to some extent limited to Paltrade members which is very limited in numbers (Paltrade, 2019). In other words, it has poor communication with non-member stone enterprises and this points to an overall limited information services to stone and marble SMEs.

2.6.3 The Analyses of the Supporting Organizations

Based on the literature review, and depending on his experience as the CEO of the USM, the researcher conducted a SWOT analysis of the private sector organisations. The analyses are based on the information services provision perspective. These analyses will shape the base for the analyses of the informational role of USM as it considers the main private sector supporting organization that expected to provide the information services to the stone and marble SMEs.

Table 2.5 *Supporting organisations SWOT analysis*

Strengths	Weakness
<ul style="list-style-type: none"> • Regulative laws • Many organization 	<ul style="list-style-type: none"> • Absence of supportive public policy • Limited and low-quality service (public and private sector institutions). • Weak effects on the public policies • Ineffective board members (private sector institutions) • Low capable executive teams (private sector institutions) • Poor information services • Poor communication with stone enterprises

Table 2.5 (continued)

Opportunities	Threats
<ul style="list-style-type: none"> • Cooperation (between private sector institutions) • Get more members (private sector institutions) 	<ul style="list-style-type: none"> • Conflict and lack of synergy (private sector institutions) • Members declination (private institutions)

Both of the public and private supporting organisations have a common mandate regarding the support and development of the enterprises. The private sector organisations are regulated by national acts, in addition, each organisation has its internal bylaws. These legislations indicate the mandate, objectives and role of each entity within the organisation, this legislation framework is considered as a major asset for them. Meanwhile, based on his own experience at USM and being very close to the supporting organisations and being familiar with the USM and PFI, the researcher, argues that the legislations are not active in most cases. These organizations generally suffer from ineffectiveness from the board of directors where many members look generally at the position from a prestigious point of view, much more than to take a role in setting up the strategic direction of the USM.

In addition, most BMOs in Palestine lack capable human resources, especially; senior staff. This limit their ability to perform their roles well. These weaknesses, in addition to the lack of the financial resources, are reflected on the low level of services delivered to stone SMEs (Paltrade, 2014). In other words, they do not respond to the sector needs. For instance, one of the main mandates for all private sector institutions is their informational role, in other words, the delivery of high value information to members where almost every private sector organisation in which underperform. In addition, private sector organisations lack the proper and professional communication strategies

and tools. This observation is based on the researcher's experience of more than ten years with these organisations' members.

This section considers the supporting public and private organizations. The Union of Stone and Marble Industry in Palestine as the main representing organization of the stone and marble sector will be studied in detail in chapter 4.

2.7 Conclusion

The "Palestinian culture" was analysed by using a series of conceptual tools. Hofstede (2012) and (Mucchielli (1999)). Meanwhile, the chapters present the geography of Palestine, the socio-political conditions of Palestine. The chapter highlights the main economic figures of Palestine. It focuses on the stone and marble sector which forms the backbone of the industry in Palestine. It shows that Stone and marble SMEs are owned by the same family members and managed through a familial managerial style. The stone and marble SMEs face many challenges. SMEs lack the resources and capabilities to take development initiatives by their own capabilities. Therefore, stone and marble SMEs look at supporting organizations to support them meet their different needs.

CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

This chapter reviews the latest trends and development of the research topics. First, it introduces the French approach of Information and Communication Science (ICS); in French *Sciences de l'Information et de la Communication* (SIC). Next, the chapter highlights the main concepts of the research. Then, it analyzes small and medium sized Enterprises (SMEs), their characteristics and their information needs. Subsequently, it describes the Business Membership Organizations (BMO), including their information services. Finally, the chapter studies the Business Intelligence (BI) concept, its implementation Critical Success Factors (CSF), and the Business Intelligence Process (BIP). The aim of the chapter is, to set the background to the problem statement regarding the implementation of the optimal BIP at USM.

3.2 Information and Communication Sciences (ICS)

This section introduces the French Approach of Information and Communication Science (ICS), in French, *Science de l'Information et de la Communication* (SIC). First, it defines the SIC field, its characteristic and boundaries. The aim of this section is to discover the gaps within ICS and how this research contributes to ICS field.

First, do information" and "communication" depend on each other in the sense of "information-communication"? How is this link possible? What does the hyphen between the two words mean?

Information and Communication Science (ICS), whether united or split is considered a new established domain compared to other fields of the social sciences such as sociology or psychology, whereas, several countries or cultural areas distinguish

between Information Science and Communication Science (Ibekwe-SanJuan, 2012). France, on the other hand, follows its known “exceptions” by merging both fields into a unique field known in French as the *Sciences de l’Information et de la Communication* (SIC). This happened in 1975 with hot disputes. When the French Council of the National Universities, *Conseil National des Universités CNU*, the national body concerned with research-of French universities recognized this discipline under section 71, Dumas *et al.*, (2012).

Dumas *et al.*, (2008), argue that the French approach that merges both disciplines in one field is different from that of the Anglo-Saxon which considers Information Science and Communication Science as separate disciplines. Furthermore, Dumas *et al.*, (2008) states that there is a lack of joint research projects between researchers from both schools, this reflected in the limited numbers of Anglo-Saxon bibliographies that shown French researchers’ contribution in information and communication field comparing with French scholars’ contribution in hard sciences. Hidri (2015), to some extent supports the French approach of ICS, he acknowledges that Information and Communication Sciences converge and complement each other, like the case of the mathematics and physics in the hard science.

From his perspective, the researcher argues that, even information does exist in the universe before the existence of the human beings as stated by (Bates, 2005). Information science, as a discipline, is linked with communication science, as illustrated on the following example.

To give an example, the researcher argues that when both disciplines are studied from the organizational point of view, they depend on each other. Indeed, information needs can be defined through communication, and an organization disseminates information

services either internally or externally through communication by using suitable tool as well. At least, this argumentation is applicable from a practical point of view.

To conclude, the researcher acknowledges that information and communication fields are interrelated and should be studied as one discipline, he agrees with De Lavrage (2017), who argues that the empirical concept of information propels towards the emergence of meaning and construction of knowledge. Concept of information presents a common epistemological approach that can draw a common ground of research between researchers from both the information side and researchers from the communication side. This point of view is supported also by Dumas *et al.*, (2005: 8) who state that *“information and communication in their versions meaning are dual facets of unique object that to follow a popular use in France.”* This is also supported by Béatrice Vacher, (2006) who states that:

“Dans le champ des SIC qui s’intéresse de près ou de loin au travail ou à ses objets, il n’est pas toujours facile de distinguer les concepts d’information, de communication et d’organisation.” (p. 4)

This means that in the field of ICS it might be difficult to distinguish between the concepts of information, communication and organization.

The boundaries of the discipline are stipulated in CNU section 71¹. ICS covers wide range of fields such as: information, communication and organization. While, it does not point directly to the field of Business Intelligence (BI), it is displayed in the current case study about BI to contribute directly to the body of knowledge and practice of ICS. Meanwhile, BI includes the core concepts of the ICS, information, communication and organization.

¹ <http://www.cpcnu.fr/web/section-71>

3.3 Main Concepts of the Study

This section analyses the main concepts of the study, mainly, it considers the concepts of data, information, communication and organization, the researcher presents the points of views of many French and international researchers for each concept, finally, he proposes his own definition of these concepts as they will be used in the displayed case.

3.3.1 Data

What is data? This is an important question as it is a key term widely used in this research. According to the well-known online Business dictionary, data is defined as: “Information in raw or unorganized form (such as alphabets, numbers, or symbols) refers to, or represents conditions, ideas, or objects. Data is limitless and present everywhere in the universe (Business Dictionary, definition of data, 2019).

This definition considers data as the primary unorganized raw information that represents conditions, ideas or objects, and everything everywhere in the universe.

From her perspective, Bates (2005) defines data or what she calls information as: “a pattern of organization of matter and energy”. This means that data do exist by themselves everywhere in the universe, as everything in the universe either originates from a matter or energy.

The researcher acknowledges that both definitions are similar, while the first definition states that data are unorganized pattern of information, which means that data precede information and need to be analyzed to give it a meaning and to be transformed into information. The latter definition states that data are existed in everything in its basic form.

Based on that, the researcher considers data as primary or raw items that precede the information and are needed to be analyzed to give them meaning by human beings. This definition leads us to define the information as it is linked to data.

3.3.2 Information

This section studies and compares several definitions of the concept of information. According to Bates (2005), she distinguishes between information one from information two as follows:

Information one “is a pattern of organization of matter and energy”. The researcher argues that this definition could correspond to the definition of data as explained in the previous section. Information two, on the other hand is “a pattern of organization of matter and energy given meaning by a living being”. This definition corresponds to using Information one or data in a "meaningful way". In this way, Bates explains the "effects of" - or the meaningful difference made by - Information on a group or a person. Bates does not, however, deal with the link with "communication".

According to the famous online business dictionary, information is defined as: “Data that is (1) accurate and timely, (2) specific and organized for a purpose, (3) presented within a context that gives it meaning and relevance, and (4) can lead to an increase in understanding and decrease in uncertainty. Information is valuable because it can affect behavior, a decision, or an outcome (Business Dictionary, definition of information, 2019).

According to this definition, information is an accurate, timely, and organized meaningful data. The researcher claims about the accuracy aspect of the information in this definition, while, he ascertains that given a relevant meaning to the data within a

specific context is more important. This aligns with the opinion of a famous researcher on information and ICS, Christian Le Moëgne, who states that:

"il résulte que l'on doit définir, à chaque fois que l'on prétend penser ou agir en contexte et situation, c'est-à-dire modéliser, ce que l'on entend dans ce contexte et cette situation par information et communication" Le Moëgne (2006 :30)

This applies that the means which information gives depends on the context or situation; in which is applicable to the communication.

3.3.3 Communication

According to Yves Jeanneret, communication is included in information, which is a relationship, uniting subjects through material, and intellectual mediations (Jeanneret, 2004). On the contrary, Daniel Bougnoux states that it is the opposite. For Bougnoux (2001), information is also a content of which it specifies that it is loaded of signification, the communication being a relation only able to bring sense. The researcher sees that even information and communication should be studied together as just earlier explained; still each of them has its own explicit definition. The researcher does not agree with Jeanneret that communication is included in information, on the contrary, he supports Bougnoux's point of view that communication is a relation that enable exchanging information to make sense. This more operational definition leads us to take into account the following definition of communication as presented at the online Business Dictionary, communication is:

“Two-way process of reaching mutual understanding, in which participants not only exchange (encode-decode) information, news, ideas and feelings but also create and share meaning. In general, communication is a means of connecting people or places.

In business, it is a key function of management, an organization can not operate without communication between levels, departments and employees (Business Dictionary, definition of communication, 2019).

3.3.4 Organization

In the analysis of organizations: a sociological anthropologist, Séguin and Chanlat (Seguin *et al*, 1986) summarizes the organization under two visions:

- A functionalist vision of the organization; Functionalists consider it "a balanced system within which order, harmony and consensus reign". The main components would be goals, technology and structures; the secondary components would be the division of labor, power and culture;
- A critical view of the organization that has remained marginal for a long time; it is based on works from Marxism or Weberian thought.

According to the online business dictionary, an organization is:

“A social unit of people that is structured and managed to meet a need or to pursue collective goals (Business Dictionary, definition of organization, 2019).

At this stage, the researcher acknowledges that an organization is an entity managed to pursue specific goals. Further elaboration on the concept of organization is considered when studying the Small and Medium Sized Enterprises (SMEs), and the Membership Based Organizations (BMOs) in the later sections.

3.4 The Small and Medium Sized Enterprises (SMEs)

This section analyses Small and Medium Sized Enterprises (SMEs) as organisations. Brigitte Guyot (2009), a specialist in Information and Communication Sciences (ICS), recognises an ambiguity with the term "organisation". Then, what is an "organisation" in the context of this thesis? This question will be answered in two parts. First, the study

of « organisation » in ICS is presented. Then, definitions of “organization” are discussed.

According to Béatrice Vacher (2007; 2009), a specialist in ICS, stated that the study of "organisation" from a French ICS perspective gravitates around four basic “articulations” between:

- projects and professional practice
- emergency/crisis and routine situations
- writing for oneself and writing for others
- everyday internal working situations and external communicating to a public.

This implies the need to identify the characteristics of an organisation, notably its management tools in their normative, personalised, material and value-laden dimensions (Vacher, 2009).

Il reste que peu de recherches insistent sur les prescriptions, proscriptions et jugements qui forment les règles du jeu de l'organisation et qui sont inscrits dans ses outils de gestion (Vacher, 2004 ; de la Broise & Lamarche, 2006 ; Vacher, Le Bis & Hassanaly, 2007).

Les outils de gestion sont le plus souvent des abrégés de valeurs comme le vrai et le bon dans l'organisation traditionnelle occidentale. Ils sont nécessaires et non signes de vertu. (...) Position dont l'étude nous semble résolument SIC (Vacher, 2009).

In this context, this chapter characterizes business-oriented organizations, with a particular interest in projects and professional practice, and everyday internal working situations and external communicating to a public

Concerning the common usage of the term "organisation", *The New Collins Dictionary* (1982) describes it as “a business or administrative concern united and constructed for a particular end”, and “order, tidiness, or system”. In short, the noun "organisation" has two broad meanings, which could be described as “ambiguous” (see Guyot, 2009, above). On one hand, an organization can be seen as an identifiable “united” entity intentionally created “constructed” to achieve “particular end” objectives. On the other hand, an organization also implies a way of conducting actions, which ensures, in this case, the logical arrangement of elements (“order”, cf. *New Collins Dictionary*, 1982), neatness and order (“tidiness”, cf. *New Collins Dictionary*, 1982), and combination of interrelated elements forming a collective entity (“system”, cf. *New Collins Dictionary*, 1982), How do these two levels of definition match those of a specialist field like *Information and Communication Sciences* (ICS)?

Guyot echoes everyday usage as found in *New Collins Dictionary* (1982). First, Guyot (2009) describes an organisation as an "organised collective actions" encapsulated as an “*opération organisante*” entity. Then, Guyot (2009) also sees the term "organisation" as a "way of organising », i.e. a way of conducting actions. In this chapter, the researcher focuses more on organisations as **social entities with-a-purpose**. ("organisation" as a way of conducting actions – via procedures, rules, norms, processes – is developed in following chapters).

A business “entity with a purpose” can have as its purpose to make a profit. For a non-profit “entity with-a-purpose”, like USM, this can mean providing a designated service. Given this, Christian Le Moëne (2015), a specialist in ICS, formally differentiates between an “inherited organisation” with-a-purpose from a “project organisation” with-a-purpose.

An “*inherited organisation*” (or an “institutionalised social organisation”) arises from a long evolution where its structure and behaviour patterns are not explicitly chosen, wanted or designed in terms of an objective. This gives inherited organisation unlimited complexities in its forms and logic (Le Moëgne, 2015: 146). On the contrary, a “*project-driven organisation*” is deliberately human-made (“artificial”, cf. Simon 1991) having precise objective-centred functions. Project-driven organisation has extremely limited – but controllable - complexity to reflect “the limits of our capacities to rationalize the logic of our actions” (Le Moëgne, 2015: 146).

In reality, business-oriented entities are a blend of inherited and project-driven organisations. In this chapter, however, the focus is more on formally characterising and project-driven SMEs in order to clarify the challenges to support business organisation like USM. This analysis is used to define Small and Medium Sized Enterprise (SME) and the Membership Based Organization as can be seen in the next chapters.

In this context, the following section introduces the latest trends in the definition of the SMEs, their importance, challenges, development needs in general and information needs in particular, the role of government in fulfilling those needs. Finally, the researcher concludes this section by comparing this international trend with the Palestinian situation in order to establish the Palestinian SMEs needs in general and to identify their information needs in particular.

3.4.1 The Definition of Small and Medium Sized Enterprises

Based on the previous section, the researcher defines The Small and Medium Sized Enterprise as: a project- driven entity with a purpose of making profit.

The abbreviation SMEs is used by many international institutions such as: The World Bank, European Union (EU), and the World Trade Organization (WTO). Nowadays, the acronym (SMEs) exists everywhere to point out to the small and medium sized enterprises (OECD, 2004). Before embarking on the quantitative and qualitative definitions of the Small and Medium Sized Enterprises (SMEs), let us first define the business enterprise. According to the European Commission:

"An enterprise is considered to be any entity engaged in an economic activity, irrespective of its legal form. This includes, in particular, self-employed persons and family businesses engaged in craft or other activities, and partnerships or associations regularly engaged in an economic activity" (EC, 2003).

This definition, which is introduced by the European Commission, later became the European Union, is still valid until now. This introductory definition should be explained from the beginning to differentiate the enterprise which points out to profit entity from the non-for-profit organization. Because both are different, while the first entity engages in an economic activity for making profits, the second has a supportive role for the first. Now, let us proceed to the approaches used to differentiate the SMEs.

There is no universally accepted set of criteria to define the Small and Medium Sized Enterprise (SMEs). As we see later on, each country has its own criteria to define the SMEs. Even more, the determinants criteria of SMEs vary from time to time, or between different sectors in the same country. Same thing applies to the international institutions, as there are no consensuses on the set of criteria to differentiate the SMEs, it varies from country to country or from sector to another (Bersha & Pula, 2015). To define an SME, Carter and Jhon (2006) synthesize two approaches used by researchers, experts and several international institutions and bodies, such as the World Bank, United Nation

Industrial Development Organization (UNIDO), and The European Union (EU): Those are the quantitative and qualitative approaches. The following section introduces both of the approaches extensively.

3.4.1.1 Quantitative Approach:

The quantitative approach is widely used by researchers, policy makers, national and international institutions to categorize the enterprises into micro, small, and medium sized enterprises. This approach depends on numeric criteria, such as: the number of employees, total assets, and annual revenue. For example, the European Commission (EC) uses this approach to identify the SMEs according the numbers of staff, annual turnover, and annual balance sheet (EC, 2003). Among those three criteria, numbers of staff criterion should be applied in addition to either, annual turnover or annual balance sheet. The following table summarizes the quantitative approach categorization of enterprises in Europe that came into effect starting from January 1, 2005 and still valid until now (EC, 2003).

Table 3.1 *The categorization of small and Medium Enterprises in the European Union*

Company category	Staff headcount	Turnover	or	Balance sheet total
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m		≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

The International Finance Corporation (IFC, 2010) identifies an SME by using the number of the employees as the sole criterion. According to this definition, an SME is a registered business with less than 250 employees. The World Bank (2011) conducted a worldwide cross-country analysis to see what the set of criteria are used to define the SMEs, the result showed that every country has its own criteria to define SMEs. In addition, while the most used criteria are the number of employees followed by sales

volume. Fifteen countries out of eighty-six state that they use the loan size as a quantitative criterion to define SMEs. The table below displays some examples of the criteria used to define SMEs.

Table 3.2 *SMEs quantitative categorization, Source: World Bank (2011)*

Country	Max. Number of Employee	Max. Annual Sales in USD\$	Max. Loan Size in USD \$
Azerbaijan	5	124412	311029
Peru		2500000	
Zimbabwe	20		50000
Italy	20		
Morocco		6205707	124114
Sudan	10		
Netherlands		73500000	
Canada	499	43700000	4374069

Despite the differences of the criteria and thresholds used to categorize the SMEs between different countries and even more between the international institutions as seen before, quantitative approach is very important and used for different purposes such as: benchmarking a country against another, comparing different regions in the same country, providing arbitrary threshold for imposing tax and to determine the possibility at public support (OECD: 2004).

Even though, this quantitative approach could be easily criticized at both national and international levels. At the national level, first, it does not consider the differences between the volumes of different sectors in the same country (Stockes & Wilson: 2010). This does not take into account the size of business enterprises which varies according to the industry within which the enterprise operates, such as construction, manufacturing, whole sale mining, trade, retail trade and services Hatten (2011). Second, the criteria may vary between national institutions, even from bank to bank (Ardic *et al.*, 2011:6). Finally, the criticism is applicable to the criterion of the number

of employees, as it neglects the part-time and temporary workers (Curran and Blackburn, 2011).

At the international level, it is difficult to imply one sole universally accepted criterion to define SMEs. Because there are huge variation between countries, particularly, developed and under development countries. To conclude, there is an absence of consistent set of criteria to categorize the enterprises. Therefore, it is very difficult to perform SMEs cross country analysis (Ardic, 2011; WB, 2011). As a result, the researcher claims that the quantitative approach is not the ideal approach to categorize the enterprises; this leads us to study the qualitative approach and to see whether it is the best used approach for this mission.

3.4.1.2 Qualitative Approach

Due to the absence of consensus on the set criteria used to define the SMEs, either at the international or at the national level as shown by the quantitative approach, see above, the United Nations Industrial Development Organization (UNIDO) proposed and encouraged countries to use a qualitative approach to differentiate SMEs from big enterprises (Dababneh& Tukan, 2007). The following table summarizes these qualitative criteria.

Table 3.3 Table Application of Qualitative criteria of the UNIDO. Source: (Dababneh & Tukan, 2007).

Criterion	SMEs	Large Companies
Management	<ul style="list-style-type: none"> • Proprietor-entrepreneurship • Functions linked to personalities 	<ul style="list-style-type: none"> • Manager-entrepreneurship • Division of labor by subject matters
Personnel	<ul style="list-style-type: none"> • Lack of university graduates • All-round Knowledge 	<ul style="list-style-type: none"> • Dominance of university graduates • Specialization
Organization	<ul style="list-style-type: none"> • Highly personalized contacts 	<ul style="list-style-type: none"> • Highly formalized communication
Sales	<ul style="list-style-type: none"> • Competitive position not defined and uncertain 	<ul style="list-style-type: none"> • Strong competitive position
Buyer's Relationships	<ul style="list-style-type: none"> • Unstable 	<ul style="list-style-type: none"> • Based on long-term contracts
Production	<ul style="list-style-type: none"> • Labor intensive 	<ul style="list-style-type: none"> • Capital intensive, economies of scale
Research Development	<ul style="list-style-type: none"> • Following the market, intuitive approach 	<ul style="list-style-type: none"> • Institutionalized
Finance	<ul style="list-style-type: none"> • Role of family funds, self financing 	<ul style="list-style-type: none"> • Diversified ownership structure • access to anonymous capital market

The researcher acknowledges that this approach can be linked to “inherited organization”, see above, with its implicit roles and decisions, this approach has an infinite amount of uncertainties, and it can be linked to the national cultures that varies from country to another as proposed by Hofstede (2010) and explained in chapter one. This qualitative method considers different categories to differentiate the SMEs from the large companies.

First, it considers the management style; where the firm could be classified according to the owner-manager style. While the owner is almost the manager in case of the SME, this is not necessarily the case in large firms, which usually have external managers. In addition, while, the management style is centralized around the owner in the case of SMEs, large firms have divisions and departments according to their necessities. The

researcher argues that the Palestinian stone and marble SMEs are mostly family businesses, where owners are managers at the same time.

The second criterion is the personal factors. This consists of two sub criteria: first, is the schooling level, where SMEs always have a smaller number of personnel with university degree, in contrary, the large firms, always have staff with university degree level or above. Second, sub criterion concerning the experience of the human resources, it yields by time at SMEs, while, the large firms have specialized staff. This criterion also differentiates the Palestinian stone and marble SMEs, from the one hand, the schooling level of the owners and even of the workers is very limited comparing with the total number of employees (PSMC, 2014). In addition, from his experience, the researcher ascertains that SMEs managers accumulate experience, in addition, most SMEs lack the qualified human resources in many fields, especially at marketing as presented in chapter one.

The third criterion explains the organizational style and communication levels. It is highly personalized in SMEs, while it is formalized in the case of large firms. This criterion also applicable in the case of the Palestinian stone and marble SMEs, it aligns with the Hofstede (2010), that Jordanians and so Palestinians accept long power distance, see chapter one.

For the sales criterion, most stone SMEs owners blame that their sales are not constant and vary from a month to another, consequently, their relations with their clients fluctuates from time to time and therefore, it is difficult to talk about loyal relation.

Regarding the production criterion, it is a labor intensive in the case of SMEs, on the opposite, it is capital intensive in the case of the large enterprises. In the case of the Palestinian stone and marble SMEs, this criterion is valid too. It is worth mentioning

that, most stone and marble factories in Palestine employ hand workers to make the final finish of some kind of products which can not be done by machines.

For the research development criterion, most SMEs follow market intuitive approach, while, the large enterprises follow institutionalized approach. The researcher argues that this might be understood to the lack of the capable staff to perform the required research and studies at most SMEs, on the opposite, the large enterprises always have the capability to perform such missions. In the case of the Palestinian stone and marble SMEs lack the qualified and trained staff to perform the research and development, in particular performing the market research and studies.

The last qualitative criterion is relevant with the financing approach, it is a self or family financing in case of the SMEs, on the contrary, most large enterprises take loans to cover some activities and to finance their expansion plans. The researcher argues that this criterion completely conforms the situation of the stone SMEs in Palestine. Furthermore, the stone SMEs mostly lack the financial resources to expand their businesses, for example to buy new production lines, meanwhile, they face difficulties in acquiring financial loans due to the collateral of loans asked by banks (USM, 2011).

The researcher acknowledges that the qualitative approach is more important than the quantitative approach. This approach shows the strengths, weaknesses and general characteristics of the SMEs. In the following section we apply this approach to the Palestinian stone and marble SMEs in details to understand the SMEs capabilities, resources, strengths and weaknesses to evaluate whether the stone SMEs can fulfill their information needs depending on their capabilities and resources, or they seek supports from external institutions?

3.4.2 Stone and Marble SMEs according to the Qualitative Approach

In the following section, the researcher analyses the Palestinian stone and marble SMEs using the internal *strengths, weaknesses*, and the external *opportunities and threats* “SWOT” analysis tool. This analysis is based on the available literature, meeting with some key persons from the industry, and finally, the researcher depends on his own experience as the Chief Executive Officer of the USM for more than ten years. The aim of this analyses is to diagnose the stone and marble SMEs abilities to respond to their business information needs.

Regarding the management style, stone and marble SMEs are family businesses with private property, the managerial functions are individualized. According to Union of Stone and Marble Industry, no stone and marble corporates are registered in Palestine (USM,2017).

For the Personnel or the human resources, most human resources, either the owners or the workers at the stone and marble SMEs have relatively low schooling level, according to the stone and marble industry survey conducted by the Palestine Stone and Marble Center in 2015, less than 5% of SMEs employees staff hold university degree or above (PSMC, 2015). The researcher as argues that new generations of the owners of the enterprises usually leave schools at earlier age to follow the steps of their fathers. At the same time, the managerial capabilities at the sector are more experience-based rather than specialization based. In other words, the managers and workers build their capabilities by time through experience. Few of them attend training courses to enhance their skills. The administration is highly vertically concentrated style, where the authority always in the hand of manager and his sons and brothers, this aligns with Hofstede analyses in the first chapter as Palestinian expect and accept long power

distance. In addition, hiring external staff is not usual as the owners want to keep all responsibilities in their hands.

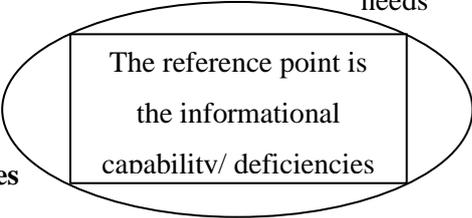
Employment of women is very rare; just few enterprises employ few females at the administrative position, while no female had been hired in the production side (PSMC, 2015). This conforms with the result of Hofstede (2010) as the Palestinian society is a Masculine society.

The companies lack the capabilities in management in general and in marketing in particular due to the familial managerial style and lack of financial resources (USM, 2011). This is a major obstacle that hinder most stone and marble SMEs from penetrating international markets, they depend on their intuitions or story telling from peer SMEs owners.

the financial resources of the stone and marble SMEs are mainly based on personal and familial resources, meanwhile, most stone and marble SMEs lack the required budget to finance their expansion strategies and they find difficulties in getting loans from banks as mentioned above.

the following table illustrate the SWOT analyses of the stone and marble SMEs in Palestine.

Table 3.4 *Stone and Marble SMEs SWOT analysis*

Strengths	Weaknesses
<ul style="list-style-type: none"> • Supply of unique locally produced raw materials • Long experience • modern machineries and equipment • strong brand image in the international markets • flexibility 	<ul style="list-style-type: none"> • poor management style (family business) • decisions dilemma; conflict, mainly between different generations • Poor cooperative culture • absence of senior staff • limited marketing capabilities • Weak financial resources • Old technology (mainly SMEs) • difficulties in meeting information needs
Opportunities	Threats
	
<ul style="list-style-type: none"> • Growing demand globally; Gulf states in particular. • Favourable trade agreements in key markets • The existence of supporting institutions • Availability of the donor's projects 	<ul style="list-style-type: none"> • Poor business environment • Political constrains: restrictions on movement of people and goods • International competition. • Depletion of resources • Lack of government supporting projects • Lack of reliable information and intelligence about markets, technology and international trends in the sector.

The stone and marble SMEs have many strengths due to many factors. First, the availability of high-quality raw materials considered the main asset for the stone and marble enterprises, the technical specifications of Palestine natural stone are excellent and comply with international standards. In addition, there is a variety of attractive colours that are demanded in international markets. Second, the owners of the stone SMEs have capitalised long experiences in production, taking in consideration that the industry started tens of years ago. Third, the image of the Palestinian product in the international markets is good; Jerusalem Stone has a well-known brand (USM, 2016). Finally, few entrepreneurs have the latest technology and production lines; this enables

them to comply the high-quality products and accurate measurements as demanded in the international markets.

In contrast, the stone and marble SMEs in Palestine suffer from many weaknesses that hinders their competitiveness. The family business managerial style is a major problem that faces Palestinian stone SMEs. In other word, stone SMEs are owned and managed by the same mentality where the father or the big brother's decisions should be respected (Farra, 2006). Besides, the existence culture limits the cooperation between rivals taking in consideration that there are plenty of areas where they can cooperate for the benefits of all. Additionally, stone SMEs suffer from the absence of capable skills, specifically, capabilities in marketing. The lack of financial resources hinders most stone and marble SMEs from fulfilling their information needs required for developing the SMEs and to penetrate the international markets. A clear example of the human resources deficiencies, stated by USM's ex. chairman (Subhi Thawabteh).

"we do better in production compared to with marketing, our member enterprises lack the information about the international markets, they do not have qualified marketers who have the skills to gather and analyse the data about the international markets, this is limited to very few companies. Honestly speaking, we have less than the number of two hand of fingers as qualified marketers".

Stone enterprises can benefit from many opportunities. The demands on the natural stone worldwide and in Gulf Counties in particular are big opportunities that could be exploited, moreover, the Palestinian National Authority has signed many trade agreements with many countries like: The Arab Countries, *European Union* (EU) members, United States of America, Turkey and Russia (Ministry of National Economy, 2017). Furthermore, the existence of many supporting organizations and the

USM in particular is considered an opportunity that stone and marble SMEs might benefit from these organizations' services such as the information services.

Finally, stone and marble SMEs in Palestine face many threats. The sector appears to have strong competition abroad and major obstacles at home (USAID, 2006). Some of these obstacles are related to the regulatory framework, poor business services, little access to finance and infrastructure (PFI, 2009). In Palestine, stone and marble SMEs like many other SMEs face many challenges such as: little attention is given to support SMEs development initiatives, weak governmental policy, lack of service provided by relevant organizations, insufficient financial opportunities, and poor business environment. This limits their productivity and competitiveness in general.

To conclude, from the informational capability point of view, the researcher ascertains that stone SMEs lack reliable information and intelligence about the opportunities and the competitors in international markets. This is mainly due to the managerial style, where all decisions are concentrated on the hand of the managers who always engage in all activities and tasks depending on their intuitions and experience. In addition, most stone and marble SMEs lack the capable human resources who can conduct the research and development in general, and the marketing research and studies in particular. Furthermore, most stone and marble SMEs lack the financial resources to hire highly qualified staff to perform these missions. In brief, Palestinian stone and marble SMEs face information deficiencies and are not able to fill this gap by their own resources and capabilities.

Based on this analysis, how can Palestinian stone and marble SMEs deal with their weaknesses and the information deficiencies? what are the challenges the SMEs face? what are the information needs of the stone and marble SMEs in Palestine? Could

information deficiencies be compensated by other supporting organizations? following sections tackle these topics in details.

3.4.3 The Challenges Facing The SMEs

SMEs have almost crucial socio-economic importance to every economy worldwide. Meanwhile, SMEs face many multidimensional challenges such as: trade barriers, fall of cost of products, logistics, technology absorption, finance and many others (OECD, 2004:13). Thamrin (2017) argues that obstacles hinder SMEs from achieving long-last existence and only few of them achieve sustainable growth. Kasim et al. (2016) state that SMEs lack required capabilities to face surrounding challenges. Those challenges include lack qualified human resources, limited financial resources and business information. These obstacles hinder SMEs from developing new technologies and penetrating new markets (OECD, 2004). Quader & Abdullah (2009) ascertain that lack of information is a major marketing obstacle facing SMEs. Finally, it is worth mentioning that scarcity of information is a big challenge not only for SMEs in developing countries but for those in developed countries like Japan (Yoshino, 2016). In the following section, the researcher sheds light on SMEs different needs and information needs in particular.

3.4.4 The Information Needs of SMEs

As a result of globalization and technological change, extensive competition, in addition to the existence of various players, business environment become more dynamic and unstable. Therefore, information has become a strategic tool for business and SMEs in particular to respond to this changing environment, (Kassim *et al.*, 2016:152 & OEDC, 2004:13).

SMEs information needs cover a wide range of different areas about the organization, this include, customers, markets, competitors and business environment. In her study about SMEs information needs in South Africa, Ponelis (2014) states that those needs are mainly financial information, forecast/projections, performance data benchmarking, market research, competitive intelligence, technology, human resources and legal information. Kassim *et al.* (2016) in their study about SMEs managers' information behaviors in Indonesia state that SMEs managers need information about all aspects relevant to their business. This includes but not limited to business opportunities, potential markets financial, information, government legislation and others. The following section considers the information needs of the stone and marble SMEs in Palestine.

3.4.5 The Information Needs of Stone and Marble SMEs in Palestine

In Palestine, the researcher ascertains that there is a lack of publications about the information needs of SMEs in general and stone and marble SMEs in particular. As a result, the empirical study was carried out to define the Palestinian stone and marble SMEs information needs, information sources, preferred means of communication and SMEs managers readiness to pay additional fees for getting high value added business information.

The result of the study was presented in an international conference at IPAG business school at Nice, France, (Labour *et al.*, 2017). The result showed that the most important perceived information needs were: marketing, finance, technology and know-how business opportunities, logistics information and training respectively. The researcher supports this result that information about potential markets occupies the priority of information needs requested by stone and marble SMEs members. Based on his daily

work observations, obvious numbers of members ask for the support of USM to offer information about international markets and to find potential clients. This reflects their inability to respond to this crucial information needs.

The second important information need is information about potential financing and loans sources. This describes the situation in Palestine where the banks and financial institutions are very conservative in giving loans. They ask for many conditions and collaterals before giving the loans to businesses in general and to SMEs in particular (Labour *et al.*, 2017). This could be analyzed due to the instable political conditions and the absence of governmental guarantee schemes.

Regarding the information resources, the study showed that these sources respectively are: the governmental agencies, fairs and exhibitions, Networking, internet, academic institutions, experts and consultants, USM, Palestine trade center, banks and financial institutions, chamber of commerce and mass media respectively. This result illustrates that SMEs managers perceive that the Palestinian Business Membership Organizations BMOs, such as USM, Paltrade and chambers of commerce as secondary information sources. This perception of stone and marble SMEs managers contradicts with the mandate of most BMOs. Most BMOs mandates clearly state that the provision of business information to members is a core service of these organizations. For example, in the case of USM, the organization has five main objectives where three of them are directly linked to business information services (USM, 2011). This leads us to conclude that Palestinian BMOs underperform their information services tasks.

Finally, the last part of the study concluded that the majority of the participants, (90%) in the study, state that they are able to pay additional fees to get more value-added information (Labour *et al.*, 2017). This result reflects two main points. First, stone and

marble SMEs highlight the importance of relevant information to their businesses, while the second indicates that this information is not acquired and stone SMEs have a big gap in filling it. Thus, they are ready to pay additional fee to acquire these types of information.

In a similar study conducted about information needs of SMEs in the North West area of the United Kingdom (Bournemouth University, 2008), only half of the respondents stress their willingness to pay additional fees for more value-added information. This big deviation of the result in both studies could be augmented by two main points. First, the diverse situation between Palestine as a developing country with a special economic and political context compared to the UK situation as a developed country. Second, the study in Palestine conducted over the industrial stone SMEs; which is very traditional industry with family business management style with lower human and financial resources capabilities. In contrast, a study conducted among the UK's to investigate the information needs of the SMEs service sector. The researcher perceives that SMEs service sector in the UK has more financial and human capabilities to respond to some of their business information needs. Even though, the result reflects the importance of the business information as perceived by SMEs managers, regardless of their locations.

To conclude, SMEs face many challenges regarding their information needs. Meanwhile, they lack the capabilities and resources to fulfill respond to these needs. This leads the researcher to analyze the informational role of the SMEs supporting institution to see whether they can respond the SMEs business information needs.

3.4.6 The Role of Supporting Institutions

Due to the socio-economic importance of SMEs, enhancing their competitiveness should be in the heart of every development strategy in all countries and in developing

countries in particular. These development strategies vary from country to another depending on the situation of the country, challenges and opportunities (OECD, 2004:13). Therefore, a cross-cutting SMEs development strategies where all stakeholders, governments, SMEs, and their supporting institutions should work together to support this sector (OECD, 2004).

As presented in previous sections, SMEs have many needs including business information and intelligence, and they face many challenges and obstacles, but SMEs lack financial resources and human capabilities to respond to these different needs in general and information needs and intelligence in particular with regard to their own resource (Wahl *et al.*, 2006: 4). As a result, cross-cutting strategies from all external supporting institutions like: government agencies, academic institutions and business membership organizations (BMOs) are required (OECD, 2004:13). These strategies are crucial to enable SMEs enhancing their competitiveness to be able to compete with large companies (Yoshino, 2016; Ponelis, 2014).

In Palestine, for example, a study about the problems of Micro, small and medium-sized enterprises (MSMEs) carried out by Atyani & Ali (2009), suggests a strong role of supporting organizations in overcoming MSMEs problems. The study shows that governments can contribute to the creation of a competitive business environment that enables MSMEs to access to financial resources, improve licensing requirements and promote exports. BMOs, from the other side, can contribute to MSMEs development by enhancing productivity through quality upgrading; they spread knowledge about technological development too. Finally, the study showed that sustaining a good cooperation between all supporting institutions that include government agencies, BMOs, research institutes and universities is important to overcome SMEs obstacles.

The researcher believes that the uniqueness of the Palestinian situation as an instable political and economic atmosphere, where MSMEs lack the financial and human capabilities to respond to their information needs and intelligence necessitates that joint efforts between all supporting organizations, where BMOs have the main role as a key approach in SMEs development. The following section presents the information role of the governmental agencies, academic institutions and BMOs as well in Palestine.

3.4.6.1 Role of Government

The governmental and public institutions have an important role to support SMEs in dealing with their challenges and scarcity of business information (ODEC, 2004). To identify the business information needs of SMEs, Kassim *et al.*, (2016) supposes that government and other public institutions should first conduct surveys to identify these needs. Once these needs are identified, Kassim *et al.*, (2016) recommends the establishment of a governmental web-based information service portal and a business information unit to respond to SMEs information needs in Indonesia. Similar recommendation suggested by Farsi *et al.* (2016) based on a result of their study regarding the main challenges of SMEs in exploiting of innovation opportunities in Iran, they proposed the establishment of a public information center to offer information services with affordable price. Yoshino & Taghizadeh-Hesary (2016) recommended the establishment of business information centers to respond to the SMEs information needs through the cooperation between the government prefectures and the chambers of commerce's. The above-mentioned studies show that governmental agencies have an important role in fulfilling the business information needs of SMEs either in both the developing or developed countries.

Now let us see the case in Palestine. Do the Palestinian governmental agencies perform the expected informational role for the stone and marble SMEs? To answer this question, first, the researcher relies on his own experience as a senior staff at both public and private sectors. He was the director of the Industrial Development Department at the Ministry of National Economy in Palestine between the years 2000 and 2009. Then, he started his position as the Chief Executive Officer of the USM. Second the researcher carried out web research over the websites of the ministries and governmental institutions to assess the governmental agencies informational roles.

Based on this research method, the researcher argues that governmental agencies poorly perform this mission. For example, taxation department at the Ministry of Finance (MOF) and Palestine Standards Institution (PSI) organize some workshops at far periods mainly on public legislations and acts. Some web sites of some governmental institutions have relatively important business information; for example, the website of the Ministry of National Economy www.mone.gov.ps contains some information about industrial licensing and trade agreement. Another example, the website of the Palestine Investment Promotion Agency (PIPA) www.pipa.ps contains some information mainly about investment priority sectors in addition to the procedures of how to apply for tax free incentives.

The researcher claims that, the Palestinian governmental agencies informational services are limited for organizing some workshops or publishing some general information over their websites, rather than providing more tailored value-added information. Therefore, the question that should be raised is: Can Palestinian BMOs fulfill the information needs of the stone and marble SMEs?

In chapter one, the researcher presented the organizations that support the stone and marble SMEs, to remind these organizations include mainly: USM, Palestine chambers of commerce, and Palestine Trade Center (Paltrade). These BMOs mandates clearly state that they are established to present their members and fulfill their needs, as well as their information needs in particular. In the following section, we highlight the BMOs definition, types, managerial styles and their informational and communicational role to establish the base to understand the BMOs role in the Palestinian situation.

3.5 The Role of The Business Membership Organization (BMOs)

The previous sections showed that Palestinian governmental agencies underperform their role in meeting the SMEs information needs. Based on that, let us discuss the informational role of the Palestinian BMOs. The section, however brushes a picture of Business Membership Organizations (BMOs), it starts by explaining the term BMOs, their types, structures and their information and communication role. Finally, the definition of BMOs as a Non-For-Profit Organization (NGO) is analyzed according to the French approach of Information and Communication Sciences.

3.5.1 The Business Membership Organization (BMOs)

Business Membership Organizations (BMOs) are studied by different scholars. For example, *Andrie Mieknev* from The World Bank group states that:

"Business Member Organizations (BMOs) generally refer to organizations with companies or individual entrepreneurs as members and include business associations, chambers of commerce, federations of business associations, employers' clubs, and so on" (Andrie Mieknev (2006:1).

According to the international consulting firms; Adam Smith International, BMOs are:

“Non-governmental, not-for-profit organizations that represent and provide services to member businesses. BMOs can be organized geographically (chambers of commerce being the prime example) or by sector. In BMO, members are required to pay regular dues, which typically provide BMOs with the majority of their fund” (Abu Yusufu, 2006: 2)

Another example of the BMOs or business association definition is provided by the United States Legal definition, they define Business Associations as:

“Membership organizations engaged in promoting the business interests of their members, they perform activities that would be unduly costly or time-consuming for an individual company to perform by itself, including lobbying” US Legal (2017).

This definition of a BMO clarifies the reason behind the creation and existence of it. From one hand, BMOs are the voice of their members that defend their interest, and they also play a growing role in representing them as stated by Shah Kalim & Rivera Jorge (2012). On the other hand, they are service providers pointing at fulfilling the needs of members which can not be afforded by themselves due to their limited resources.

Based on the definitions of the organization presented in section one of this chapter and those illustrated in this section, the researcher defines an MBO as: *“A non- for profit driven social entity with the purpose of providing designated services to members”*.

The following points describe the BMOs from different perspectives.

3.5.2 The Legal Framework of the Business Membership Organization

BMOs could be regulated, either by private or public law or both shapes at the same time. Ametta (2011), states that Business Member Organizations (BMOs) structure role

and effectiveness depending on the legal framework of the country they operate in. In Palestine for example, the chambers of commerce are regulated by the Act No. 9 in the year (Act 9, 2011), while, the industrial federations are regulated by the Act No. 2 for the year 2006 (Act 2, 2006). In addition, all BMOs in Palestine, regardless of their types, are legally required to develop their own bylaws. The bylaw explains in details the objectives, structure, mandate, tasks, and responsibilities of the General Assembly (GM) and the Board of Directors (BoD), in addition to the tasks of the Chief Executive Officer (CEO), membership related issues, and elections procedures.

3.5.3 The Financial Resources of The Membership Organization

BMOs are non-for-profit organizations as per their primary objectives; they aim at representing their members and providing them with the needed services. Meanwhile, BMOs perform income generating projects to fund their different activities and to overcome their limited resources (OECD, 2004). In general, BMOs financial resources are limited, they mainly depend on the subscription and membership fees as main revenue sources, in addition, they get fees for some additional services. Grants and government subsidies are financial sources of some BMOs too. To diversify the income generating services of chambers, a joint study supported by the International Trade Center and International Chamber of Commerce in Geneva recommended that chambers of commerce should consider information about different aspects of business in the core of their income generation services (Gunaji, 1983), the researcher argues that even this is an old study, it is still valid and supported by recent similar study carried out by Demtschück Elke & Henkel Jürgen Henkel (2013). In their study about income generating services of BMOs in India, they argued to expand the information services and to shift some of them from a free-based to a fee-based one.

The researcher believes that information services, as an income generating services, are applicable in the case of USM too. It is an opportunity for USM to diversify its income generating activities, this point of view is supported also by the result of the first empirical study conducted by the researcher, where majority of participants indicate their readiness to pay additional fees to get more value-added business information and intelligence reports as presented before in this section. Meanwhile, this responds to the information needs of stone and marble SMEs and supports USM carries out its mandate.

3.5.4 Representation of Members

BMO are representatives of their members (Abu Abu Yusufu, 2006; US legal 2017). This role is related to lobbying and advocating members' interest, mainly, in front of government and other bodies. In Palestine, for example, the role of representing members and advocating a competitive enabling business environment is ascertained by the law of Palestinian Federation of Industries (Act 2, 2006). In the case of USM, this role implies that USM should understand the interest of its members to be able to represent to them.

3.5.4.1 The Span of Work and Membership Style:

According this criterion, BMOs could be classified into two groups:

- **Business associations:** They are usually private law organizations with a homogenous membership structure, mainly concentrating on specific industries. Mostly, they have a small number of members whose expression of interests has a common concern. For example, SMEs association, women association, and industrial federation. In Palestine, the industrial federations represent business associations. Each federation or union represents a sole industrial sector. The Union of Stone and Marble Industry in Palestine (USM), Palestine Food

Industries Federation (PFIF) and The Federation of the Palestinian Pharmaceutical Industries (FPPI) are examples of this type of BMOs.

- **Chambers:** are organizations that represent the business interest of a specific region. They represent the business activities in a geographical area. All business enterprises within a specific region are potential members of a chamber of commerce and/or chamber of industry. Chambers have heterogeneous members. So, they have higher number of members compared to the business association. In Palestine, main chambers are Ramallah Chamber of Commerce, Nablus Chamber of Commerce and Hebron Chamber of Commerce.

This categorization implies consequences on the type and quality of services provided by both types of those organizations.

The researcher establishes a comparison between both types as follows: A trade association could be seen as specialized physician who has in depth experience and high skills in a specialized domain of medicine, whereas, a chamber of commerce and industry looks like a general physician who deals with a wide number of patients for a primary treatment. In short, specialized physician deals with limited number of patients, he or she has the ability to deeply investigate the case and diagnose the illness of the patients and so recommend the suitable treatment. On the contrary, general physician can make general diagnosis and give treatment for general illness. In some cases, he may transfer his patients to a specialist. The SMEs needs assessment resembles diagnosis ability and, finally, providing business services looks like treatments and giving medications.

3.5.5 The Service Provision to SMEs

Service Provision to member SMEs is a core mandate of every BMO as shown by an evaluative study conducted by The World Bank team, (IFC,2006). This survey was

conducted over 70 BMOs in different 16 developing countries argued. The result stressed that BMOs play a vital role in SMEs development through the delivery of high quality affordable services and information.

Those services cover wide range of aspects. Wahl *et. al* (2006:4), list some services that BMOs perform; they include, but not limited to business and professional information, industry standards, quality upgrading, consulting, financing services, training, research, trade promotion, matchmaking, arbitration courts and others. From their perspective, Emilia Saarelainen and Merten Sievers (2012) argue that BMOs also promote best practice, enhance the competitiveness of the companies, gather information, and provide business services and market research. In the following part, the researcher highlights the information services of the BMOs as part of the general services that should be provided to the BMOs.

3.5.5.1 The Information Services of The BMOs

The provision of valuable information is one of the major services of MBOs. Wong Chin), an international consultant in information services states that

“Information is one of the most important services that enterprises expect from chambers of commerce and industry as well as from business sector associations. This is especially true for small and medium enterprises (SME) since their in-house info-search capabilities are often weak and undeveloped” Yeow (2006:1).

Similar points had been ascertained by other scholars, such as Majali (2012) and International Finance Corporation, IFC (2006). They clarify that information is a main service that SMEs expect from the chambers of commerce and industry federations.

Judy (2000) mentions some types of information services of BMOs, those types cover wide range of areas, such as, but not limited to, laws and legislations, foreign trade regulations. Trade; such as tariff and non-tariff barriers, importers and exporters, country profile, economic statistics and product standards.

Another samples of information types provided by the BMOs, is the example of TANSTIA in Tamil Nadu in India, Demtschück & Henkel (2013), they acknowledge that business information services include but not limited to trade statistics, Patents, copyright and international standards, addresses of producer/exporter/importer world over, market research report of various products, import, export statistics from major Indian ports, green information-environmental laws, international events calendar like trade fairs, major conferences and seminars, government orders pertaining to small industries and sectoral analysis. Alageeli Othman *et al.* (2015) argue that the Knowledge Centre at Jeddah Chamber of Commerce in Saudi Arabia aims at providing businessmen and decision makers with economic and business information they need.

3.5.5.2 Information Services of the Palestinian Business Membership Organizations

In chapter one, we presented the main Palestinian MBOs that support the stone and marble SMEs, we conclude that most BMOs in Palestine lack capable human resources and senior staff. This weakness, in addition to the lack of the financial resources negatively affect level of information services delivered to stone and marble SMEs (Paltrade, 2014). Furthermore, the researcher based on his experience with the Palestinian business environment and business institutions, argues that most Palestinian BMOs neither carry out studies and researches to identify the business information needs of the stone SMEs, nor they use proper and professional communication strategies and tools to communicate the value-added information with those SMEs.

In brief, SMEs lack the human capabilities and financial resources to fulfill their wide range of information needs, therefore, they look for external organizations to respond to those needs. Those organizations include governmental agencies, academic institutions and BMOs. BMOs have an important role in responding to the information needs of the SMEs. Therefore, BMOs capacity should be enhanced in order for BMOs to well perform this mandate (OECD, 2006).

The researcher ascertains that, chambers of commerce and industry are general representative umbrellas of all kinds of business enterprises within an area, with limited ability to assess and fulfill the information needs of all business sectors. On the opposite, a BMOs likes USM is the specialized representative body of the stone and marble SMEs in Palestine. Therefore, USM, rather than any BMOs has the responsibility to fulfill the information needs of the stone and marble SMEs as obvious stated at USM's objectives.

But how this mission could be carried out? Obura & Matovu (2011) state that SMEs information needs should be carefully met through a well-designed information provision system. This means that, BMOs should set up tools and techniques to fulfill the information needs of SMEs. This could be approached through the implementation of a Business Intelligence (BI) system. The following section considers and studies the BI concept, its importance and implementation within a non-for profit and service organization.

3.6 The Business Intelligence (BI)

Nowadays, organizations operate in a highly dynamic business environment, where there is a huge amount of data, such as: sales, demographics, market trends, investment opportunities, competition and many others. Business Intelligence is perceived as a solution that can assist in overcome the ambiguity, complexity and uncertainty to

support managers deal with this rapid technological changing environment and to take better decisions (Shollo, 2013).

Business Intelligence is a universal trend, where several companies worldwide pay more attention and spend a sound portion of their budget on BI and related technologies. Gartner (2016), the world's leading information technology and advisory company has stated that BI and analytics market reached \$19.9 billion in 2016, which reflects the high importance given to BI worldwide. Farrokhi (2017: 22) and Luftman & Derkson, (2012) stated that BI is the fastest and largest growing and top priority IT. According to "Business Intelligence Market by Type" report (Market and Market, 2017) the global Business Intelligence market is expected to reach \$26.88 Billion in 2021, these huge investments could be understood by considering the benefits that organizations gain from such applications.

BI supports managers get up to date information, to take better decisions by using different managerial methods, such as: dashboards and scorecards to manage and improve the organizational performance management (Majali, 2013; Boselli *et al.*, 2015: p.8). Shollo (2013), mentioned that companies that adopted BI technologies and data driven decision making approach have increased their productivity between (5-6%). The figures show high demand for BI and its application, which could be explained due to the great value it has in improving the organizational decisions process (Hartley & Symour, 2015; Brichini, 2017). To conclude, BI is important for companies as it supports managers making better decisions, therefore BI attracts the attention of the managers as they perceive the importance of BI.

In the following sections, the researcher illustrates the BI concept, BI readiness Critical Success factors (CSF), the Business Intelligence Process (PIB), and finally the BI role in BMOs.

3.6.1 What is The Business Intelligence?

Since our research aims at studying how the BMOs can fulfill the information needs of member SMEs, the researcher believes that BI is a central concept that should be explained in order to introduce the definition that we are going to use in this study. This is an important initial step, taking in consideration that the term has many meanings and could be understood in different ways, as Shollo (2013), acknowledges that there is no common agreement between researchers about an accepted universal definition of BI. BI had been popularized firstly by Lung in 1958 who defined it as abstracting, encoding and archiving internal documents and their dissemination, it was defined by Howard Dresner of Gartner group in 1989 as a set of concepts and methods to improve decision making by using fact based computerized support systems (Farrohki, 2017: 11). Currently, BI is defined by many scholars as either a management approach, activity or information technology. (Hawking, 2013: 14; Vitt *et al*, 2002) argue that BI is a management approach that helps an organization to define relevant and useful information to their decision making. While, Howson defines BI as an activity that:

“Allows people at all levels of an organization to access, interact with, and analyze data to manage the business, improve performance, discover opportunities, and operate efficiently” Howson (2007: 2).

From her perspective, Shollo's (2013: 26), synthesizes that concept varies from one dimensional to multi-dimensional definitions. For the one-dimensional definition; BI could be defined as a process, technology or product, while for the multi-dimensional

one; it is a set of them together. The table below illustrates several examples of the BI definition:

Table 3.5 *BI definition, source: (Shollo, 2013: 26)*

Types of definitions	BI definitions
	<p>“Business Intelligence (BI) can be defined as the process of turning data into information and then into knowledge.” (Golfarelli <i>et al.</i>, 2004: 1)</p> <p>“...as the continuous activity of gathering, processing and analysing data - supported by a BI system.” (Dekkers <i>et al.</i>, 2007: 626)</p>
BI as a process	<p>“The term BI can be used to refer to:</p> <ol style="list-style-type: none"> 1. Relevant information and knowledge describing the business environment, the organization itself, and its situation in relation to its markets, customers, competitors, and economic issues 2. An organized and systematic process by which organizations acquire, analyse, and disseminate information from both internal and external information sources significant for their business activities and for decision making.” (Lännqvist and Pirttimäki 2006: 32) <p>“Business intelligence (BI) is a broad category of technologies, applications, and processes for gathering, storing, accessing, and analysing data to help its users make better decisions.” (Wixom and Watson, 2010: 14)</p>
BI as a technology	<p>“Business intelligence encompasses all of the software applications and technologies that a company uses to gather, provide access to, and analyse data and information about its operations.” (Pemmaraju 2007: 14)</p> <p>“Business intelligence encompasses a set of tools, techniques, and processes to help harness this wide array of data and allow decision makers to convert it to useful information and knowledge.” (Clark <i>et al.</i>, 2007: 589)</p>

Shollo merges several dimensions and she define BI as:

“Business Intelligence is data-driven analysis - a process of gathering, storing, and analyzing data through the use of different technologies and applications - which is relevant for decision-making” Shollo (2013: 11).

The researcher stands with the process dimension of the BI, as all other features and dimensions role is to support the process of gathering, storing, analyzing relevant data to produce value added information, which is then deliberately be communicated to relevant members to fulfill their information needs to help making better decisions. Therefore, the researcher ascertains that Business Intelligence Process (BIP) is the backbone of the Business Intelligence system. The researcher considers the Business Intelligence Process as “an interrelated, non-linear activities by which the organization ensures the fulfilment of its information needs, through defining, collecting, storing, and analysing of relevant data and dissemination of information to relevant stakeholders”

Based on the above proposed definition and by considering the Competitive Intelligence Process (CIP) developed by Calof (2007). The researcher ascertains that both processes are similar as the aim of a Business Intelligence (BI) is to meet all relevant business information, including CI as a subset, in other word the CI is encompassed at the BI. Therefore, the simplest form of the BIP’ tasks is as follows.

- Identification of Business Information needs
- Collecting data from different sources
- Analyze the collected data
- Communicate the business information and intelligence to the relevant stakeholders.

Based on the BI definition and the proposed BIP, the researcher argues that the challenge facing an organization is how it can run this process. More details about the BIP implementation at the USM are covered at chapter 6 of this thesis.

3.6.2 The Readiness for Business Intelligence Implementation

BI needs a significant investment, in addition, it is a complex system to implement, therefore organizations should take this in cooperation. (Farroukhi, 2017; Hartley & Seymour, 2015). So, any for profit firm or service organization should assess, from the beginning, its readiness to implement BI. This includes a detailed assessment and auditing of all areas related to the adoption and implementation of the BI, as this shapes a corner stone that could impact the success of the system. This is very crucial step, since the failure of BI project has a severe impact on the organization and very costly at the same time (Farroukhi, 2017; Hawking, 2013). The following section sheds light on the Critical Success Factors (CSF) of the BI implementation.

3.6.3 The Business Intelligence Readiness Critical Success Factors

In order to ensure the success of BI, it is important to evaluate the organizational readiness for BI implementation. Boesseli *et al.*, (2015: 8) argues that BI success measurement helps the assessment of the feasibility of the BI project. For Farrokhi (2017), the assessment, on one hand, shows the gaps within the organization in which it is not ready for BI implementation and to bridge them, on the other hand, it avoids wasting time and resources.

BI implementation readiness has attracted the attention of many scholars as explained later in this section. They searched for the conditions and prerequisites of success, which they called critical success factors (CSF). The starting point is to answer the general

questions, what are CSFs? And how they are developed? Let us first present some definitions of CSF, and then we see how CSF are developed.

One of the most important definitions of CSF is that of Rocherat, who defines CSFs as: “Critical success factors are the few key areas where the things must go right for the business to flourish” Rocherat (1997: 85)

According to Caralli, (2004: 2), CSFs are the key areas that are essential for an organization to achieve its mission. He emphasized that an organization must ensure high performance in these areas to achieve its success and to ensure the accomplishment of its mission. Also, Farrokhi defines critical success factors (CSF) as: “A set of conditions, characteristics and variables which are defined in all fields and, if managed carefully lead to organization success” Farrokhi (2017: 77)

Now let us present how CSF are developed? And what are the CSFs for BI implementation? To answer these questions, let us refer to the relevant literature.

In general, CSF are identified and developed through different methodological approaches. Those approaches could be: a conceptual approach survey of organization, Delphi, case studies, and critical and inductive thinking approaches. These approaches could be used separately or merged depending on the conditions of the researched case (Hawking, 2013, p. 33; Celina & Olczak, 2010, p.140).

In the displayed case study, the researcher reviews the literature regarding the BI readiness CSFs to develop the initial list of them that could be applicable in the case of BI implementation at USM. This list lays the foundation to develop the criteria used to evaluate the proper BI system at USM. This method is extensively explained in chapter five.

In the case of BI Celina and Olsazk (2010) define Business Intelligence CSF as: “A set of tasks and procedures that should be addressed in order to ensure BI system accomplishment”.

It is important to mention that even the adoption of the BI is taken by top management; BI implementation success depends on several individual factors linked to capacities of the organization staff (Yoon et al., 2014). The same point of view was provided by Elbashir *et al.*(2011), who stated that the BI assimilation capacity of the operational team is much more important than of the top management to ensure BI success, Many other researchers stress that users acceptance and effective change management is crucial in reducing internal resistance and increasing BI adoption success (Hawking, 2013; Yeoh & Koronios, 2010; Williams & Williams, 2007). The researcher stands with these points of views that the capacity of the team who run the BI system is not less important than the commitment of the top management. This could be argued as, the top management commitment is the starting point, while the capacity and motivation of the staff might ensure the sustainability of the system.

3.6.4 Some Important Studies of The Business Intelligence Implementation Critical Success Factors

The following section sheds light on some important studies about the CSF of the BI readiness, then the researcher synthesizes and develop a list of CSFs of the BI readiness that are applicable to the USM case.

3.6.4.1 Hawking’s Study

Hawking (2013), has grouped and synthesized many previous studies about the BI critical success factors. Some of them were developed through an organizational survey,

while others through conceptual studies, the following table shows the sets of the CSFs of the BI implementation.

Table 3.6 *Business Intelligence Critical Success factors and Supporting research Literature, source Hawking (2013: 40)*

Business Intelligence Critical Success Factors	Description	Supporting Literature
Management Support	Commitment from top management to support the project	Watson and Haley, 1997; Sammon and Finnegan, 2000; Wixom and Watson, 2001; Adelman and Moss, 2002; Mukherjee and D'Souza, 2003; Little and Gibson, 2003; Sammon and Adam, 2004; Chenweth et al, 2006, Yeoh et al, 2006; Eckerson, 2005; Havenstein, 2006; Hwang and Hongjiang, 2007, Yeoh and Koronios, 2010
Adequate Resources	Adequate resourcing (People, Time, and Money) needs to be provided for the project team to achieve planned milestones and realize the business objectives of the project	Watson and Haley, 1997; Sammon and Finnegan, 2000; Wixom and Watson, 2001; Herrmann, 2004; Eckerson, 2005; Hwang and Hongjiang, 2007
Champion	Champions support and promote the adoption of Business Intelligence amongst their peers	Jensen and Sage, 2000; Wixom and Watson, 2001; Chenweth et al, 2006; Eckerson, 2005; Yeoh et al, 2006, Yeoh and Koronios, 2010
User Participation	The involvement of end users in the development and implementation of a Business Intelligence solution will have a direct impact on its success	Wixom and Watson, 2001; Adelman and Moss, 2002; Mukherjee and D'Souza, 2003; Yeoh et al, 2006; Hwang and Hongjiang, 2007, Yeoh and Koronios, 2010

Table 3.6 (continued)

Team Skills	The project team should be composed of personnel with a strong business and technical skills	Wixom and Watson, 2001; Adelman and Moss, 2002; Sammon and Adam, 2004; Yeoh et al, 2006 Hwang and Hongjiang, 2007, Yeoh and Koronios, 2010
	The extent of heterogeneity of source systems and the quality of data they store can seriously impact on the success of Business Intelligence projects.	Sammon and Finnegan, 2000; Wixom and Watson, 2001; Rudra and Yeo, 2000; Mukherjee and D'Souza, 2003; Shin, 2003; Sammon and Adam, 2004; Solomon, 2005; Stanick, 2006; Yeoh et al, 2006; Hwang and Hongjiang, 2007; Joshi and Curtis, 1999; Rudra and Yeo, 2000; Marshall and Harpe, 2009
Development Technology	The selection of appropriate technology (hardware, software, methods and programs) will impact on the efficiency and effectiveness of the Business Intelligence project.	Watson and Ariyachandra, 2005; Chenweth et al, 2006; Hwang and Hongjiang, 2007, Wixom and Watson, 2001, Yeoh and Koronios, 2010
Strategic Alignment	The degree to which the implementation of Business Intelligence supports the corporate goals.	Williams and Williams, 2003; Chenweth et al, 2006; Sammon and Finnegan, 2000; Mukherjee and D'Souza, 2003; Sammon and Adam, 2004; Watson, 2006; Hwang and Hongjiang, 2007; Little and Gibson, 2003; Yeoh and Koronios, 2010

This is an important synthesis of the CSFs of the BI implementation, which could be mainly categorized into two main categories: The organizational factors and technical ones. The organizational factors depend on: people, their capabilities, organizational environment, management support, and championship, the internal support and motivations amongst peers, user's participation and involvement, skills of the team are clear examples of organizational BI readiness CSF. In contrast, technical CSFs are: source system and adopted technology development are examples of these factors. It is important to mention that there is a third element linked with the process dimension.

Finally, the alignment between the organizational goals and adopted BI system is a crucial factor, since it presents the degree of the support of the organizational goals by the adopted BI system, taking into consideration that all resources and systems within an organization should be managed for this purpose.

3.6.4.2 Farrokhi's Study

Farrokhi (2017) classified the (BI) CSFs in two categories; organizational and technical. Organizational category includes: management support, organizational culture, decision making structure, goal alignment, managerial IT knowledge management style, resource allocation, user participation, balanced and skilled project team and agile project management. While, the technical category covers technical related aspects, such as: system quality, information quality, reliable back-end system, metadata management, technical frame work and agile methodology.

I agree with his analysis that the organizational factors are the most difficult to solve as it mostly linked to human factors. Because, at the same time, they play a dominant role in BI implementation success, they are relevant to organizational difficult aspect such as: organizational culture, management style and commitment, employee capabilities and motivation, in addition to the decision-making structure within the organization which play a crucial role in management performance. In contrast, the technical factors are linked to buying some hardware and software programs, therefore it easier to implement compared with the organizational factors, but, even though these factors complement each other and should be implemented in parallel to ensure the success of the BI project.

3.6.4.3 The Study of Yoon *et al.*

In their study regarding the individual level factors that impact the BI adoption, Yoon *et al.* (2014) identified a model of four categories of CSFs. The proposed model consists of four main categories, except the technology related factors, the other three concentrate on the individual factors of the workers, such as: motivation, support, skill and learning environment. The researcher argues that the company should ensure the readiness of the human factors, including their capabilities, skills and motivation in other words as the most important CSFs to ensure BI implementation, these human related CSFs are more important than the technology related ones, which aligns with the result of the Faroukhi's study mentioned above.

3.6.4.4 The Study of Williams and Williams

Another important study about the BI implementation CSFs is a study conducted by Williams and Williams (2007), they identified seven key factors of BI readiness, and they are:

- a. Strategic alignment
- b. Continuous process improvement culture
- c. Culture around use of information and analytics
- d. BI portfolio management
- e. Decision process engineering culture
- f. BI technical readiness
- g. Business/IT partnership

As shown, these factors could be categorized into three main groups, organizational, technical/ IT, and process related factors. The organizational factors are: First, culture around the use of information, this factor is relevant to the internal organizational environment, second, the BI profile management which is related to the top

management commitment and the employee capabilities. On the other hand, the technical CSFs of BI readiness is the BI technical readiness; this factor is linked to the hardware and software programs needed to implement the system. While, the process related CSFs are: The continuous process improvement culture, and the decision process, they are linked to the BI concept as a process: This process might be linked to business information identification, data collection, data analyses, and communication (Lännqvist and Pirttimäki 2006: 32) as cited by Shollo (2013). Finally, the alignment between all factors is important to put in place the BI system. This study highlights the importance of considering all of the three abovementioned categories of the BI implementation CSFs together to ensure the success of the BI system. Therefore, this study differs from other studies that stand with one category over others. For example, Farroukhi (2013: 80) states that the organizational factors, that encompasses factors such: management support, organizational culture, user participation and team skills are much more important than technical factors, similar results are highlighted by (Button *et al.*, 2014) and Adamlä & Cidrin (2013), who stated that the non-technical factors are the hardest ones (Farroukhi p. 80).

The researcher argues that BI implementation CSFs should consist of organizational, technical and process related factors, and an alignment between these factors are important to implement the system.

The researcher argues that BI implementation CSFs should consist of organizational, technical and process related factors, and an alignment between these factors are important to implement the system. These CSFs build the steps for the evaluation criteria that will be employed to evaluate the different alternatives for each BIP tasks mentioned before. This is considered an important contribution of how the evaluation

criteria might be derived from the CSFs in the field of Business Intelligence. a full description is presented in chapter 6 “the evaluation model” of this thesis.

3.6.5 Business Intelligence in Service and public Organization

The importance of the BI system in the for-profit organizations is obvious and studied by many researchers, while, few researchers studied the BI role in non-for-profit sector (Boesseli *et al.*, 2015). They found that BI adoption in the public sector is far behind the private one. Nutt (2006), refers this to the decision making differences between both sectors, he found that decision makers at private sector has the power to adopt the BI more easily than of those of the public sector. This result supports the opinion that private sector managers are more proactive to take decision regarding BI budget and implementation (Boesseli *et al.*, 2015: 7).

Even though, other scholars emphasize on the importance and applicability of BI in the public and service sector as well. For example, Khan (2010) argues that BI is ranked as the top priority for the Chief Information Officers (CIOs) in the public sector (see public service manager). Farroukhi (2013) states that BI is applicable for both, profit and not for profit organizations, but without giving clarification of how may BI could be implemented or what are the critical success factors (CSFs) for BI readiness in the non for profit sector. In contrast, (Boesseli *et al.*, 2015) studied the public service intelligence and evaluated how the public sector can exploit decision support systems, in their research, they have identified many CSFs of BI adoption that enhance public services and could provide effective results. Even though, they conclude that, still, there is a lack of reference cases about BI implementation in public sector, which might be a strong barrier for BI diffusion within public organizations. Therefore, the researcher claims that the short list CSFs that presented at the above figure and that were derived

by the researcher from many studies about the BI implementation at the for-profit organizations might be used at the case of the public and non-for-profit organizations in general.

Although, public sector organizations have many constraints in BI adoption compared to private sector, they need to offer better services with limited resources to encourage the development of BI projects in public services.

3.7 Conclusion

To conclude, stone and marble SMEs in Palestine lack the resources and capabilities to respond to their own information needs, therefore, they look at the external supporting organizations to help them getting the required business information. Meanwhile, the chapter showed that both the Palestinian governmental agencies and the BMOs underperform their information mandates. To bridge this gap, these organization should implement a BI system to enhance their information services and to support their missions. This opinion aligns with needs Williams & Williams (2007), who compare the benefits of BI in both private and public sectors, he states that while, the private sector looks for measuring sales, reducing costs and measuring profits, public sector, on the other hand, seeks to improve level of services, to use resources wisely and to support the mission.

The important question that should be raised is: which BMO has to implement a BI system to fulfill the information needs of the stone SMEs? The researcher ascertains that it is more worthy that USM implements a BI system rather than other BMOs. This argumentation is based on two factors. The first, the USM is the primary organization responsible for the stone and marble SMEs according to the act (2 for 2006). While, the second is based on the USM's mandates which states that fulfilling the information

needs of member SMEs is a primary objective of the organization. In the next chapter, the researcher analyses the USM to diagnose its readiness to implement a BI system.

CHAPTER 4

THE UNION OF STONE AND MARBLE INDUSTRY

4.1 Introduction

In chapter one, we introduced the Palestinian situation, it analysed the Palestinian socio-economic environment, the stone and marble sector figures, stone and marble SMEs importance and challenges, the role of supporting organizations and an overview the USM's establishment.

Chapter two discussed the literature review related to this study. It started by considering the French concept of the Information and Communication Science (ICS), then, it presented the conceptual framework of the study which includes: the small and medium sized enterprises (SMEs), the membership-based organization (BMOs) and their informational and communication role. The chapter shows that implementing a BI system is important for the BMOs to enhance their information services, furthermore, the chapter highlights the BI implementation critical success factors (CSFs). The chapter concludes that stone and marble SMEs in Palestine face many deficiencies that prohibit them from fulfilling their information needs. Meanwhile, neither the governmental agencies, nor the stone and marble SMEs supporting BMOs can perform this mandate.

This chapter, however, sheds light on the Union of Stone and Marble Industry in Palestine (USM) in details. Firstly, an overview of the organisation is given, then, the governance and structure of the organization is presented, after that, the membership system and financial status is analysed, next, cooperation and networking is discussed. Finally, a SWOT analyses of USM is conducted to assess its strengths, weaknesses, opportunities and threats to see if USM carry out its informational and communicational

role. This analysis supports understanding the problem that USM faces. This analysis establishes the base for the methodology that will be employed to find an optimal solution for this problem.

4.2 The Establishment of the Union of Stone and Marble Industry

The Union of Stone and marble industry in Palestine (USM) is as an independent, non-governmental, non-profit and a single sector membership-based organization. It was established in 1996 through an initiative lead by the Ministry of Industry Palestine in collaborations with some pioneer businessmen from the stone and marble sector. USM was the first established industrial federation in Palestine due to the importance of the stone and marble industry. The Ministry of Industry took the lead to create a representative body that could support the government initiatives in organizing the sector and in developing stone and marble enterprises The USM is regulated by the Palestinian Act (No. 2 for 2006), in addition, an internal bylaw was developed to regulate the organization (USM's bylaws, 2007).

4.3 The Vision, Values and Goals of The Union of Stone and Marble Industry

USM's vision, mission and general goals are as follows¹:

- **Vision:** leading change and creating opportunities.
- **Values:** transparency, cooperative work and professionalism.
- **Goals:** according to the internal byelaw of USM (USM's bylaws, 2007), it has the following main goals:
 - To champion the industry and to defend the interest of members through an active dialogue and lobbying with the government, local and international institution.

¹ www.usm-pal.ps

- To Build the capabilities of the workers within member enterprises in different topics; mainly in marketing and production
- To Apply the projects and programs that ensure the capability of the sector as an export-oriented industry
- To organize the Palestinian participation in international trade fairs, conferences, and events.
- To establish an information centre and to offer the relevant information about the stone industry locally and abroad.
- To help members in finding and penetrating potential markets.

As it is clearly seen, the last two main goals of the USM are directly point to the information provision services to member SMEs. Later in this chapter we will see if the USM performs this information provision mandates or not?

4.4 The Organizational Structure of The Union of Stone and Marble Industry

This section displays the organization structure of the USM. The following figure displays USM's structure. This structure consists of The *General Assembly* (GA), The *Regional Committees* (RC), The *Board of Directors* (BoDs) and the executive team.

Organizational Structure of the USM

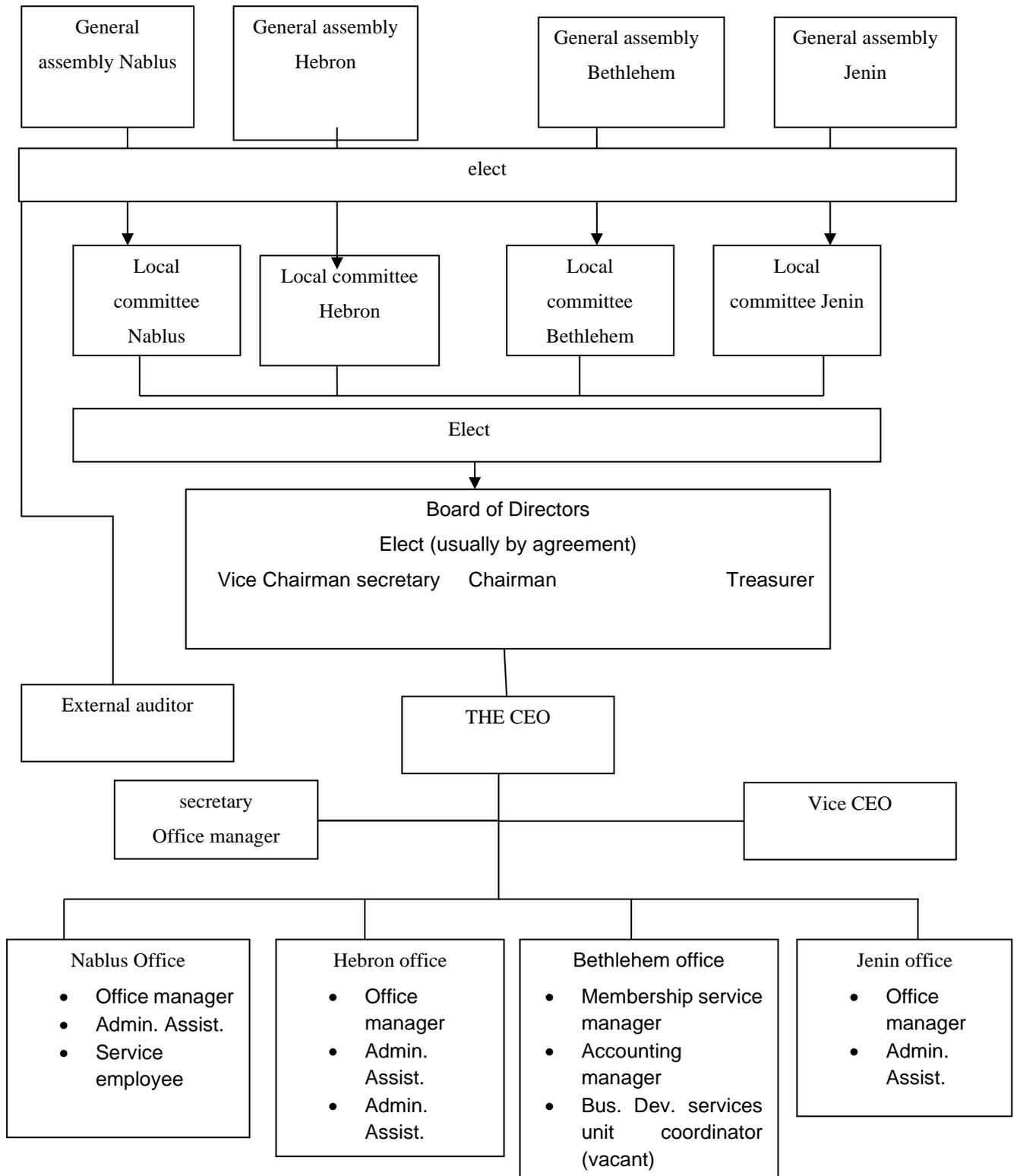


Figure 4.1. The organisational hierarchy of the USM, developed by the researcher

4.4.1 The General Assembly

The general assembly (GA) is the highest body in the organization. It has the right for taking the top decisions at the USM. According to the internal bylaws, the GA should meet at least once a year through the invitation of the board of directors (BoDs), the meeting might be ordinary or extra-ordinary according to the meeting's objectives.

Being as the highest body: the general assembly (GA) consists of all members of the organization. Currently the USM has 800 active members in the four main governorates. Bethlehem, Hebron, Nablus and Jenin. The GA's main roles are: to elect the board of directors, to approve the annual budget and the administrative reports, and to assign the external financial auditor. Finally, it has the right to change or to amend the internal bylaws in an extra-ordinary urgent meeting. The GA's decision is taken by a simple majority principle (50%+ 1) of the voters, taking in consideration that the attendees must be 50%+1 of the overall GA members (USM, 2007). The archive of the minutes of meetings of the GA shows that it has organized an ordinary meeting through the past year, while only one extraordinary meeting was organized in 2007 to amend internal bylaws.

4.4.2 The Regional Committees

According to the internal bylaws, the general assembly members in each governorate elects their regional committees. Each regional committee consists of seven members. Each regional committee elects its representatives (members) in the Board of Directors (BoDs). The executive role of the regional committees is limited to discussing and to following up members' needs at the regional level, while the issues related to the industry at the national level are the responsibility of the Board of Directors.

4.4.3 The Board of Directors

The Board of Directors (BoD) of the USM is the body that is advocated on behalf of the GA's interest. This section describes the election process of the BoD, in addition to their role.

The members of the BoD are elected by the regional committee members to represent them at the national level. The elections occur once every three years. According to by-laws the board of directors consists of eight members, three members from Bethlehem, two members from each Hebron and Nablus and one member from Jenin governorate. In their first meeting, the elected board members elect the chairperson, the vice chairperson, the treasurer and the secretary, while the rest are considered as board members according to the article No. 22 of the USM's internal bylaw (USM bylaws, 2007)

According to Boland (2009), the director of the Food Centre at Iowa state University, the role of the BoD includes but is not limited to calling the GA for the annual meetings, setting the policies of the USM, formulating the strategies and approving the plans and programs, managing the funds and properties of the USM and approving the annual budget, representing USM locally and abroad, hiring the CEO and following up the activities of the executive team, approving the best practices manual, admittance and termination of members, and appointment of committees and delegation of authority to them.

Considering his own experience at USM, the researcher observes that some of these written roles are not applied, such as: the approval of financial and administrative guide and the best practise manual. The researcher refers that, as the BoD members perceive that such manuals and guides might restrict their engagement at the organization and

might restricted their decision regarding the internal operation. This important point will be examined in the following decision level section. The board of directors should meet once every forty-five days at least, and its decision is taken with the simple majority votes 50%+1. USM board of directors keeps regular meetings in accordance to the bylaws.

4.4.4 The Executive Team

The executive team of the USM is responsible for executing the activities of the organization according to its vision and mission (see above) to achieve its overall objectives. Currently the USM has 12 staff members, who are spread over four locations, five staff in the headquarter in Bethlehem, three in in Hebron, three in Nablus and two in Jenin. The staff in Bethlehem consists of the CEO, vice CEO, the accountant, the membership service manager, the business development unit coordinator and the administrative secretary.

The highest executive position is the CEO, he has a bachelor degree in engineering physics, two master degrees in multidisciplinary studies and business administration (MBA). In addition, currently he is doing his doctoral studies in the field of Information and Communication Science at *Université Polytechnique Hauts de France* (UPHF). The internal bylaw of the Union of Stone and Marble Industry in Palestine does not mention any articles regarding the roles, tasks and responsibilities of the CEO or the executive team. In the current situation, from the daily activities at the USM, It could be said that the role of the CEO is: to support the board of directors, organising management and leadership, strategic planning, community liaison and cooperation activities, membership relations, policy relations /advocacy, financial management , fundraising

and grant management, media /communication relations and handling the day to day operation.

The vice CEO has a master degree in business administration with 16 years of work experience. Some of the responsibilities of the CEO are delegated to him from the CEO, such as following up the activities of the regional offices. In addition, he is fully in charge when the CEO is absent. The other staff members have a first degree in different disciplines, such as business administration, information systems, and marketing their experience varies from one to five years. It is worth mentioning that almost all staff members are juniors, due to the financial constrains that hinders the USM from hiring senior staff. For the researcher, this is a main weakness that reduces the quality of the services, including the information services of USM.

4.5 The Membership System of The Union of Stone and Marble Industry

This section explains the memberships system of USM in terms of registration, categorization, membership fees, voting right, and the services that members request and the current number of active members. According to the internal bylaws, any stone enterprise; processing factory, small workshop, quarry or crusher has the right to apply for the membership at USM. The BoD decides to accept or refuse a certain member. An accepted member, then pays the one-time registration and the annual subscription fees, all members pay the same membership fees therefore they have the same voting rights regardless of their volume. Currently, USM has 800 active members; that represent 80% of the volume of the industry (PSMC, 2014). In addition, the trend shows an increase in the number of members in the last years. The researcher attributes this trend to the trust that stone SMEs express about the USM, as the organisation defending their

interest and working for the development of the sector, keeping in mind that membership is optional.

At the same time, it is important to explain that the large companies benefit much more than the small ones. Big companies demand more services from the USM. These services include: capacity building programs for their employees, participating in international trade fairs and business delegation, and request for business information. This could be explained as the top management of the large companies are more aware of the importance of such services than that of SMEs. Finally, it is worth noting that the membership system at USM is referred to the time of the establishment of the organization, more than twenty years ago, the researcher believes this system it is outdated and should be developed to consider different needs of different enterprises, because, it has neglected some of the rights and duties of different categories of the industry.

Finally, the researcher argues that since member stone and marble SMEs are the owner of the USM. Therefore, their point of view regarding the information services of the USM should be considered. From one side, they are the main source for identifying the business information needs of stone SMEs, on the other hand, their feedback about such services is crucial to evaluate and so to develop such services. In brief, their voice about a BI implementation at USM should be heard.

4.6 The Financial Resources of The Union of Stone and Marble Industry

According to USM's bylaw, the main revenues are limited to the inscription fees which are paid upon the acceptance of the membership application, in addition to the annual membership fees. USM's revenues alike other international BMOs as stated by Wahl *et al.*, (2006), who describes BMOs as non-for-profit organizations as per their primary

objectives, they are funded through membership fees, service charges, grants, and public subsidies. In the case of the USM, no kind of subsidies is offered by the government. The researcher refers that to the absence of a governmental policy to fund the industrial federations, in addition to the financial difficulties that the Palestinian government faces. Same thing applies to the donor's organisations, they do not support the budget of the USM directly, rather, they allocate some direct financial funds for some projects.

According to the annual financial reports of USM for the year 2018, the revenues of the organisation strictly covered its activities. But this prohibited USM from developing new services, such as business development services and provision of business information and intelligence. The researcher argues that USM might cooperate with other organization to develop and deliver specific services that exceeds USM's capabilities and resources. This synergizes and complements the roles and efforts of similar organization.

4.7 The Activities and Services of The Union of Stone and Marble Industry

USM aims to fulfil the needs of its members through the provision of many services, these services should tackle all aspects of the industry such as; lobbying and advocacy, membership development, networking, export promotion, training and skills building, information services and many others. These services enable USM meets its mandates, so it can retain the current members and attract new ones. The following represent the main activates and services that USM carries out:

4.7.1 Training and consultancy

One of USM mandates is to build the skills of workers in the industry. Currently, USM training services covers many fields such as: production, marketing, quality

management and languages. These training courses are usually partially are funded by some international donor agencies and are delivered mainly by local experts (USM activities report, 2018)

For the consultancy, and based on his experience, the researcher affirms that USM consultancy services is poor and do not meet the minimum needs of the members. This could be explained by the fact that the USM lacks senior level staff or experts to perform this task. This is due to the limited financial resources of USM as explained above, so USM is neither able to hire highly skilled experts, nor can USM outsource this service due the high cost it requires. To overcome this deficiency, USM's BoD took a Board Decision (no. 18/2018) to establish a *Business Development Service* unit (BDS) to assess and fulfil the consultancy needs of members (BoD, 2018). This initiative will be implemented with the support of the *Japan International Cooperation Agency* (JICA) that runs a BDS project in Palestine through a cooperation with the Ministry of National Economy and with the partnership of *The Palestinian Federation of Chambers and Commerce* and *The Palestinian Federation of Industries*. The project aims to enhance the role of the chambers of commerce and industrial unions to deliver high quality training and consultancy services through building the capabilities of the staff of these organisations.

4.7.2 Information Provision

One of the main goals of the USM is to establish an information centre so to offer the relevant information about the stone industry locally and abroad (USM by laws, 2007). This goal indicates that one of the USM's main mandate is to provide the stone and marble enterprises and industry with relevant information and intelligence to help them

take better decisions. These set of information include but not limited to Marketing information, know-how and technology, financial and legislative information.

Regardless of the fact that the USM is aware of the importance of these set of business information, the question that is raised here is: Does the USM perform well its informational and communicational role? To assess this, an empirical study was conducted on a sample of USM's member SMEs, where they were asked to rank their priority of information needs, to assess their perception about USM's informational role, and finally, to assess if USM uses appropriate communicational tool when contacting members (Labour *et al.*, 2017). The result showed that most USM members underestimated the informational role of the USM, they ranked USM at below other organizations. Furthermore, the participants in the study illustrated that the USM does not use appropriate communicational tool when contacting members.

Based on his experience, the researcher acknowledges that USM's information and communication roles are very limited. Currently, the USM receives the data and information from different sources, such as: government, local agencies like the Palestinian Federation of Industries and Palestinian Chambers of Commerce, and some international agencies, such as international fairs administration, stone industry organisations. Then USM disseminate the information to all members in (one to many broadcasting mode) without any kind of analyses.

In other words, USM neither plans for the relevant data collection, nor analyses them and communicates them in a professional way. The researcher ascertains that different members need different business information types, and that information should be provided to them in a proper manner to avoid over- or under-informing its members.

4.7.3 Other Services

In addition to the abovementioned tasks, activities and service, the USM delivers several other services to member SMEs as displayed in the following table.

Table 4.1 *The services of the Union of Stone and Marble in Palestine*

Function	Activities
Export promotion	USM organizes the Palestinian participation in the international fairs and exhibitions, it also organizes many B2B sessions. In addition to organisation of many trade delegations and missions.
Access to Finance	USM offers members with some additional services; such as financial opportunities through meeting with banks and financial institutions.
Environmental protection issues	USM supports members acquiring up to date waste water treatment technology
Policy related issues	USM with cooperation with other organisations organizes meeting and carries out advocacy and lobbying campaigns to raise industry related polices, such as power related issues, tax incentives and others.

The researcher argues that all of the above-mentioned services are linked with the business information related to the industry. For example, export promotion requires that USM collect data about the stone events worldwide, processing these data, developing a newsletter or a report and communicate it to relevant members. Same approach is applicable for the case of access to finance service. USM should identify its

members financial needs, collect the data from the banks and loan agencies, analyse them and communicate value added information to USM's member.

4.8 The Cooperation and Networking

Based on his experience, the researcher can affirm that USM is aware of the importance of cooperation with different parties to help the organization performing its mandate. USM participates in projects and committees relevant to the industrial sector in general and stone and marble industry in particular. These networks include but are not limited to the government, the private sectors organizations as well as international peer organisations. These networks support USM delivers more high-quality services, including exchange and share of information relevant to stone industry. USM has strong networks with similar institutions, locally and abroad. It is an active member in The Palestinian Federation of Industries. At the same time, it keeps good cooperation with the chambers of commerce and industries, Palestine Trade Centre, Businessmen associations and so on. Many meetings and exchange of ideas take place between the different parties taking in consideration that all these organisations have cross cutting agenda to serve their members.

4.8.1 Cooperation with the Government

USM keeps continuous relations and dialogue with the government, it participates in industry relevant meetings and committees, such as policy and legislation issues, for example, Industry law, Natural Resources Law, National Export Strategy, Electricity Regulatory Council, taxation, water and electricity tariffs and many others. Furthermore, USM requests meeting with senior officials from governmental bodies to discuss the challenges and needs of the stone and marble industry, in addition to discussing the industrial development initiatives. Finally, the researcher notes that,

although USM is involved in significant advocacy and policy efforts, its impact on the government policy still very minimal when talks about Taxes related issues. The researcher analyses that the government does not show any kind of flexibility when issues linked to the public revenue cut. The researcher explains that as from the one hand, the Palestinian government always faces budget deficit to cover all the public expenditures, from the other hand, the government lacks the long-term strategies toward the industrial development and decision makers always to at short term strategies.

4.8.2 Cooperation With International Organizations

USM plays an important role not only locally but abroad as stone and marble industry has its linkages in the international markets. Some Palestinian stone SMEs participate in business delegations and in the international exhibitions to promote their products. and to see stone industry related technology and know-how. Currently, USM organizes the Palestinian participation in many international exhibitions such as Marmomacc in Verona, Italy, The Big 5 Show in Dubai, Coverings Show in the USA, in addition to the organisation of many business delegations. Therefore, in order for USM to carry out this mission, USM cooperates with many peer international organizations and USM has signed many *Memorandum of Understanding* (MoUs) with *Confindustria Marmomacchine*, which is a peer Italian organisation, The Jordanian natural stone manufacturer organisation (Jostone), Indian Stone Technology Centre in India (Stontec). The objectives of these agreements is to exchange experiences, to build the skills of the managers and workers in the stone SMEs, to organize fairs and exhibitions, and to exchange business information about stone industry needs in all aspects. The aims of such agreements is to strengthen the bilateral relation and for the benefits of all parties.

4.8.3 Cooperation with Higher Academic Institutions

USM is aware of the importance of building strong relation with academic institutions. It has signed some *Memorandum of Understanding* (MoUs) with Palestine Polytechnic University (PPU), Palestine Ahliya University and Al-Quds Open University. The relation with the Palestine Polytechnic University is a model one, because both sides with the Ministry of National Economy have established a tri partnership project called the *Palestine Stone and Marble Centre* (PSMC). This project is funded by the Italian Government and implemented by the *United Nations Industrial Development Organization* (UNIDO). The following section sheds light on this project.

4.9 The Palestine Stone and Marble Centre (PSMC)

The PSMC was established in 2009 at Palestine Polytechnic University (PPU) in Hebron, Palestine. PSMC is based on a unique tri public- private- academic partnership between the Palestinian Ministry of National Economy; the public sector, Union of Stone and Marble-USM; the private sector, and Palestinian Polytechnic University-PPU; the academic sector (PSMC establishment MoU). This project has been implemented by the United Nations Industrial Development Organization (UNIDO), and it was funded by the Italian government.

Beside his role as the CEO of the USM, currently, the researcher occupies the position of the chairman of the executive committee of the PSMC where he is responsible for leading a team comprising of the manager of the PSMC, the manager of the technical laboratory of the Centre and the representatives of the PPU and the Ministry of National Economy. The main mission of this committee is to set up the strategic and action plans of the centre and to ensure that PSMC performs its mandate in a professional manner. Based on his at the PSMC, and by referring back to the website of the centre. In the

following sections, the researcher sheds light on the objectives and main sections of the centre.

4.9.1 The Objective of the Palestine Stone and Marble Centre

The PSMC main objectives are as follows:

- To provide the sector with skilled graduates in stone and marble industry, through the provision of a 2-year undergraduate diploma in Stone Technology and Management.
- To develop and deliver specialized training courses in different disciplines such as: production, quality, marketing and other related topics to enhance the capabilities of the managers and workers in the sector.
- To perform the tests on the quality of the stone products, that include, the physical, chemical and technical properties and to contribute in the development of standards and specifications of stone and marble products.
- to share business information for stone and marble SMEs in cooperation with the USM, government and international institutions.
- to deliver consultancy about new technology and know how
- To conduct applied researches related to the stone and marble, such as waste treatment and environmental protection issues.

4.9.2 The Sections of the Palestine Stone and Marble Centre

The PSMC consist of three parts:

- Academic Diploma: a two-year program with 4 semesters that give students a degree in marble and stone industry.
- Industrial Laboratory: Industrial Lab is one of the main parts of TEVT centre. It is equipped and established with modern machines in a way that

gives students and related sectors modern training in stone and marble industry and the steps that stone industry pass through. Students are taught how to look for the blocks of natural stone and how to cut it in a way to minimize waste.

- Testing Laboratory: The testing laboratory is equipped with modern machines for testing stone and marble products. Testing includes specific gravity, water absorption, compressive strength, abrasion, hardness, ...etc.

The researcher affirms that PSMC plays a vital role in the development of the stone and marble sector in Palestine, in addition, the researcher acknowledges that PSMC has an important informational role, in particular, in the field of technical information regarding stone standards and specifications, waste treatment, and technology transfer. Therefore, the role of the PSMC could complement the role of the USM in areas where the USM lacks the capabilities or resources to perform such services alone.

4.10 The Analyses of Union of Stone and Marble Industry in Palestine

This section examined the institution of the USM. First, USM is analysed according to the study of *Espace de bureaucratisation d'une structure*, the space of bureaucratization of a structure (Garrette. *et al.*, 2009), then a general SWOT analyses will be conducted from an informational and communicational point of view.

4.10.1 The Decisional Levels

This section discusses the decisional level of each of the entities. Michel Labour, a researcher in *Information and Communication Science (ICS)* presents and defines the type of decisions as follows (Labour, 2016):

- 1 Strategic Decision: sets the direction and allocates the resources

- 2 Tactical Decision: plans how to put in place a strategy by setting precise objectives, infrastructure and teams
- 3 Operational Decision: ensures that the tactical decisions are effectively executed in given situations
- 4 Actional Decision: involves the direct contact with users day to day. It can also be called the front-office level

According to the organisational structure of USM, each level in the hierarchy has its own responsibilities and duties as described earlier. In the following lines, the researcher based on his experience at the USM, identifies the decision types of each group based on Labour's definition, then, he analyses the decisional power of each entity according to the bylaws and what actually they decide upon on the ground, to investigate the decision pathologies and to see whether the organisation works in harmony, i.e. if the main structures are aligned.

The internal bylaws of USM delegates the top decision level/ strategic decisions to the GA which has the right to decide the following aspects: elections of the regional committee members, approval of the annual audited budget, selection of the external financial auditor and more importantly, the GA has the exclusive rights to modify bylaws. At the moment, the GA uses its rights on the ground.

The regional committees have responsibility to elect their representative in the BoD, and to discuss the stone industry related issues at the regional level. While, the strategic issues such as the implementation of big projects, policies and dialogue with the government is the responsibility of the BoD. In fact, most regional committees do not meet regularly and delegate most of their responsibilities to the BoD (USM, 2016).

Even though, the bylaw gives the authority to the BoD to draw the vision and to set the strategic direction of the USM. Usually, the BoD engages at different levels of decisions, few decisions are conducted at the strategic level and the BoD descends to the tactics and operational level, even more, to the actional level too.

While, the CEO duties and tasks are not mentioned in the bylaws, he is involved in all decision levels: strategic, tactical, operational and actional. Frequently, he is delegated authority to replace the board of directors in many decision taking topics, like participating in policy making to present the USM’s point of view. Also, he engages in tactical, operational and actional decisions. Finally, due to their limited capabilities, other executive team are engaged only in operational and actional day to day decisions, they refer back often to the CEO. The figure below displays the decision types and what actually each entity decides upon. To analyse this unhealthy decision structure, the researcher employs the Berndt Brehmer’s (1992) tool on “decisional pathologies”. as shown in next section.

Table 4.2 *Decision Levels at USM*

Responsibility	Decision Power distribution as stated at the bylaws	Actual Decision type
BoD	Many strategic, few tactical	Few Strategic, many tactical, operational, and even actional.
CEO	Not stated	Many Strategic, few tactical, operational and actional.
Vice CEO	Not stated	Tactical and operational
Front-office staff	Not stated	Actional

4.10.2 Decision Pathologies at The Union of Stone and Marble Industry

The decision pathologies work of Berndt Brehmer (1992) is an important tool that can be utilised in analysing the decision structure within an organisation. Pathologies, here, mean deviation from an assumed normal state of something over a period of time giving rise to structural dysfunctions leading to an apparent change in a person or organization associated with an identified dysfunction, and study of identified dysfunctions and the apparent changes they cause. These set of decision pathologies can be:

1. Thematic vagabonding refers to a tendency to shift goals when shifts from one sub-goal to another but fail to work on the problem as a whole (Brehmer, 1992: 226).
2. Encystment involves sticking (rigidly) to one specific goal – that the subject feels competent – but fails to achieve to solve all problems (Brehmer, 1992: 226).
3. Refusal to make any decisions at all.
4. Blaming others for one's own failures.
5. Delegating responsibility that cannot, or should not, be delegated.
6. Not delegating responsibility that should be delegated (Brehmer, 1992: 227).

Based on these pathologies, the researcher observes that the following decision pathologies exist at USM:

- The BoD usually blames the executive staff for not achieving some organizational goals, such as offering the business information to members; meanwhile, BoD does not take the decision to allocate the human capabilities and financial resources needed to perform this mandate.
- The BoD delegates some of their strategic responsibilities to the CEO, while it is a core mission for the BoD, such as setting up the organizational goal, or representing the organization at the high-level meetings.

- The BoD engages in some operational and day to day tactical level such as accounting procedures or human resources issues like employee leaves and they do not delegate these missions to the CEO, keeping in mind that these issues are totally the responsibility of the CEO and the staff.

The researcher ascertains that USM suffers from structural decisional pathologies because deviations from the normal situation as stated at the bylaws and actual taken decisions are obvious. These pathologies create internal conflicts which hinders the organisation from achieving its goals. One can imagine what happens when the BoDs appear to “meddle” in the day to day activities and leave their responsibility regarding strategic decisions. Such situation creates problems and hinders the organization from working efficiently and normally provides its services, such as business information.

Most importantly, these current decision pathologies indicate that the points of views of different entities or actors at the USM, which includes the BoD and staff should be considered when an important decision such as the implementation of a BI system is needed to be taken. An extensive analysis of this crucial point is discussed at later chapters.

4.10.3 The Space of Bureaucratization of The Structure of The USM

According to Garrette and colleagues’ study of *Espace de bureaucratization d'une structure*, the space of bureaucratization of a structure (Garrette. *et al.*, 2009: 41), an organization or enterprise could be evaluated from along main axis, they are: specialization, formalization and coordination, the figure, below, indicates the analyses of some French organizations.

Espace de bureaucratisation d'une structure

(Garrette, Dussauce et Durand, 2009 : 41)

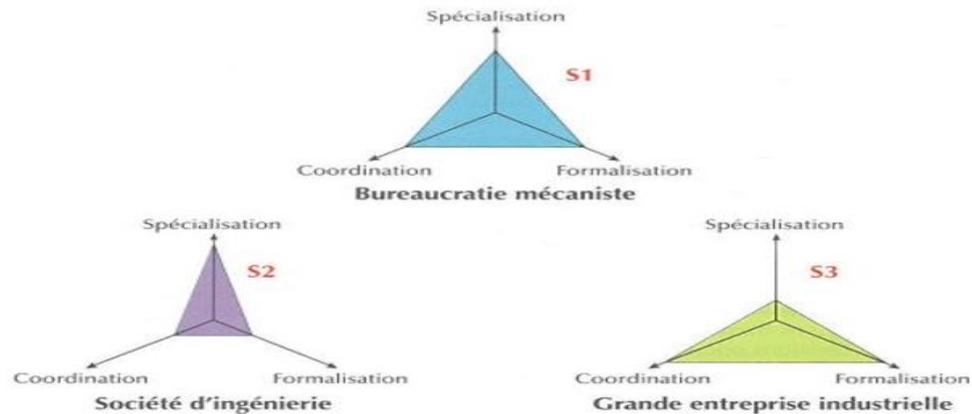


Figure 4.2. Espace de bureaucratisation d'une structure, (Garrette. et al., 2009 : 41)

By employing this model, USM could be analysed as follows.

The Formalization Axis: This means that the organization is well formalized according to the regulations, bylaws, organization hierarchy, and decision levels. USM could be ranked minimum on this axis, due to the decision pathologies explained before. In addition, the USM internal bylaws are very old, and need to be modified to align with the development trends.

The Specialization Axis: Specialization indicates the extent to which the organization's services align with its mandates. The researcher argues that the USM is classified medium on this axis, as the USM is a specialized organisation that was created to fulfil the needs of stone SMEs, meanwhile, the level of services that the USM provides is poor as mentioned before, due to the skills shortages, the limited financial resources and the low commitment of the top management.

The Coordination axis: This axis points to networks and cooperation that the organisation creates to perform its mandates. From his perspective, the researcher can observe that USM has many networks with local and international organizations to support performing its mandates, but these networks are not at the expected levels.

Therefore, the researcher believes that the USM is ranked medium on this axis. Enthought, this network considers an opportunity for the USM to perform its mandate.

4.10.4 SWOT Analyses of USM

The following table illustrates a SWOT analyses of the USM. The analysis depends on the researcher’s experience and it is conducted based on the informational and communicational role of the USM.

Table 4.3 *SWOT analyses of the USM*

Strengths	Weakness
<p>The regulative act and internal bylaw (representative of the main industrial sector in Palestine)</p> <ul style="list-style-type: none"> • USM Brand Name with strong voice and Strong advocacy • Membership numbers are in growth trend • Qualified executive director who is effective at attracting new members • Good diversity of projects 	<ul style="list-style-type: none"> • Limited financial resources • Low effectiveness of some board members and regional committees • Low capabilities of the executive team • Not enough staff • Limited range of services with low quality • Weak with low value-added information delivered to members • Ineffective communication channels • Weak information system to support the decision making • Weak information gathering from outside resources • Old internal procedures manual • Executive director is not available for high value tasks.

Table 4.3 (continued)

Opportunities	Threats
<ul style="list-style-type: none"> • Networking with local institution • Networking with international institutions • Build the capabilities of the staff • Potential projects funded by the donors (Palestine Stone Centre at Palestine Polytechnic University & Business development Services project funded by Japan International Cooperation agency. • The existence of the Palestinian embassies and commercial attaches and Palestinian organisation in the diaspora. • Develop a BI system benefiting from USM's network 	<ul style="list-style-type: none"> • Political instability • The competition with some business organizations; like Chambers of Commerce and Palestine Trade Centre) • The public industrial policies • Lack of support by the government

The table displays that USM has many strengths, such as: good brand image, number of members is increasing, in addition it is the primary organisation that officially represents the stone and marble industry in Palestine, and finally, USM CEO is capable with a vision. these points shape the basis for developing the organisation.

In contrast, the USM suffers from weaknesses that hampers the organisation from carrying out its mandate. The weaknesses are mainly related to the informational and communicational role of the organisation, the researcher argues that USM does not have any business intelligence system that enables the organisation to fulfil the business information needs of member SMEs. This is clear as USM does not follow a systematic

way in identifying, gathering, analysing and communicating the information requested by members. The researcher notes that, this deficiency is mainly referring to the absence of the BoD's main role, the decision pathologies (see above), the limited information resources, the limited skills of the executive staff, and the absence of a communication plan.

The USM can benefit from the strong point it has to exploit the potential opportunities. This includes, but not limited to, building the skills of the USM staff through the potential funding from international donors' agencies. In addition, the USM can use its network with local and international peer organisations, and the embassies outside of Palestine to exchange information, in order to satisfy members' business information needs.

Finally, the USM faces several risks that should be taken into considerations like: the lack of governmental support and the general unstable political conditions. The USM should employ all possible resources and strengths to avoid these threats, which may hinder the organisation from fulfilling its mandate.

4.11 Conclusion

In Palestine, there are many public and private sector organizations that have been established to serve the SMEs. The USM is a membership-based organization established in 1996 to present the stone and marble SMEs. According to its mandate, USM has many objectives to defend the interest of member SMEs, lobbying and advocacy at the national level, build the skills of the workers at the stone and marble SMEs, in addition to promote the industry locally and abroad. Furthermore, one of the most important services of SMEs, is to fulfil the business information and intelligence needs of member SMEs while keeping in mind the inabilities of most SMEs to perform this mandate by themselves. But the question raised here is: Does the USM perform this

mandate? The answer comes from USM's members who state the USM underperforms its informational role. Therefore, how can the USM perform better to carry out this mandate, what business intelligence system does it need? The chapter that follow will present the research methodology that will be employed to answer to these questions.

CHAPTER 5

THE RESEARCH METHODOLOGY

5.1 Introduction

This chapter introduces the rationality of the used methodology. From the previous chapter we saw that USM underperforms its informational services delivered to its member stone and marble SMEs. The researcher concludes that USM has to implement a proper BI system to overcome this deficiency. Therefore, the USM faces a strategic and complex organizational problem which requires to be solved. But, how could this be reached? No easy and quick answer exists. To find an optimal solution for this problem, the researcher ascertains that a formal research methodology should be employed. The aim of this chapter is to present and analyse the research methodology and method that will be adapted to support the decision makers at the USM taking the optimal decision regarding this important problem.

The researcher strongly believes that we should rely on a formal approach in dealing with this situation, because, intuitive and heuristic approaches are not sufficient to guide us in our journey looking for a solution. This argumentation complies with (Bouyssou *et al.*, 2006) who state that in the organizational problem context we are interested in rigorous techniques where formal language and tools are used, rather than a heuristic and intuitive one. They define the formal techniques as: “Set of explicit and well-defined rules to collect, assess and process information in order to be able to build recommendations in a decision or evaluation process” (Bouyssou *et al.*, 2006: 1).

Bouyssou *et al.*, (2006: 3-4) argue that such models enhance the transparency, promote communication between different actors and stakeholders, help actors come into a common understanding of the problem they face in order to reach recommendations for

solving it. The researcher strongly ascertains that such a formal approach is required to deal with the problem that USM faces due to several factors. The USM has many actors and stakeholders with different points of views and preferences. They need to have a common understanding of the problem, and, they have different decision power, in addition, this problem has an impact over hundreds of members.

Moreover, the capabilities of the USM's decision makers are questionable. The schooling level of BoD members in addition to their managerial experiences; as family business let the researcher assumes that they lack the methodological knowledge to apply a rigorous methodology to solve this problem concerning the above-mentioned problem.

As a result, the researcher has come to the conclusion that the USM decision makers are not able to fix this problem by their own capabilities and resources. Therefore, they need an external support from an analyst. This analyst should have the proper methodological techniques and tools to collect, process and analyse the data to develop a recommendation to solve this problem (Bouyssou *et al.*, 2006). This tool is what we called a decision aiding methodology.

5.2 Decision Aiding Process (DAP)

In this section we are going to define and differentiate between two important terms. Those are Decision Making (DM) and Decision Aiding Processes (DAP). In the decision making, the decision maker makes decisions, he runs the process by himself. This means that he has a problem and so he develops the alternatives, evaluate them and chooses the best one. While, in the case of the DAP, there at least two parties: the client: somebody looking for decision support, and an analyst: somebody providing decision support (Bouyssou *et al.*, :2006: 5). DAP is: “a sequence of cognitive artefacts occurs

between the analyst, who provides the analysis and the client, who seeks the support.”
Bouyssou *et al.*, 2006: 22).

Bouyssou *et al.*, (2006:21) mention several advantages of DAP, it offers the same language for all participants which enhances the transparency and encourage all actors to take a role in the process. Same points were highlighted by Stewart & Belton (2002: 5) This is what we want in performing our process; we have many actors and decision makers at the USM, so using the same formal language is important to keep them in the same mode of thinking and enhance their participation. In addition, the researcher states that this DAP allows using models and clear procedures that reduce the human bias, this is a crucial advantage of DAP because we are tackling an organizational problem that requires minimizing the human influences of the decision makers, as it is not a personal problem, many decision makers do exist, and the taken decision has an impact over hundreds of SMEs.

Again, why do we need such a process? To answer let us refer to Bouyssou *et al.*, (2006:4), who state that this DAP is mainly implemented in complex decision problems and evaluation models. This process helps in understanding the situation, formulating the problem, evaluating the alternatives and provide a recommendation for solution. These argumentations justify the need of implementing a DAP to support the decision makers at the USM.

Another important aspect of the DAP methodology is that DAP has two aspects. The first is the objectivity, which is represented by the application of the process itself, on the contrary, the subjectivity aspect is represented by the preferences of the decision makers (Stewart& Belton, 2002: 4). The objectivity aspect of DAP supports that opinion that a procedural methodology should be followed to find a solution to the problem that

the USM faces. On the other hand, the subjectivity exists in every decision as it reflects the decision makers preferences presented in the selection of the evaluation criteria and the assessment of the alternative's performance. This will be discussed later on.

Referring back to the case of the USM, the researcher claims that decision makers are not fully aware of the problem that the USM faces, in addition they lack the skills to present this problem and to develop the proper solution. Therefore, the researcher argues that DAP fits this case. He agrees with Stewart & Belton (2002: 8), who states that in the case of DAP, a support from an external consultant or in-house analyst is needed to lead the decision makers reach a desired solution for a specific problem through a step by step process. This leads us to discuss the role of the manger to see whether he can carry out the mission of the decision analyst.

5.3 The Role of the Manager

The role of the top manager is essential and is considered the corner stone in any organization. Speaking from his own professional experience, the researcher strongly agrees with the opinion that the success or the failure of any organization depends to great extent on its general manager. In the following section, we present the role of the manager from a theoretical point of view supported by a practical opinion of the researcher. The aim of this section is to assess whether the researcher can implement the DAP methodology.

According to the traditional functions of management, the managerial activities are mainly, planning, organizing, leading and controlling (DeCenzo & Robbins: 2005: 8-14). Planning means setting goals, establishing strategies and putting plans to achieve these goals. Organizing, on the other hand, means what tasks to be done, by whom and what to execute. While, leading, means influencing the employees, directing their

activities and motivating them to achieve the organizational goals. Finally, controlling means monitoring performance by comparing with the set goals and make corrections where needed. The same managerial activities proposed by Stoner (1982), who argued that management means, planning, organizing, leading and controlling the activities of an organization team and using available resources to achieve organizational goals. These two scholars present the traditional school of management in an abstract-way. Let us consider the role of the manager from an empirical case study. Let us see one of the most cited empirical studies in management and administration conducted by Henry Mintzberg who observed and interviewed managers in different industries over a two-week period (Obiefuna, 2014: 100).

According to this study, Mintzberg insisted that managers in both for profit and not for profit organizations perform 10 different roles, which could be categorized in three groups: interpersonal role, information role and decision making role. In the following section we concentrate on the information role of the manger as it is directly linked to this research.

5.3.1 Information Role

According to Mintzberg, this role consists of three main sub roles, they are monitor, analyse and disseminate, in the following sections, the researcher highlights each of them in details.

5.3.1.1 Monitor

As a monitor the manager looks for and searches for information relevant to the organization and its environment. The researcher agrees that this is a key role of the manager. Meanwhile, the researcher believes that this is the role of the manager in both the for-profit and public organizations such as BMOs. In the case of the USM, the researcher ascertains that the monitor role of the managers in general and that of the CEO in particular is crucial as the organization mandate states explicitly fulfilling the business information needs of the member SMEs as a core mission for the organization. Therefore, the managers should give priority to this role by continuously monitoring the external environment to check what threats may impact the industry or what opportunities may appear. Furthermore, the researcher argues that defining the information needs of members and collecting the relevant data is the first step in offering high quality information services to USM's member SMEs. Currently, the researcher argues that, he and his colleagues at the USM play the role of information receivers more than information seekers. In other words, they are reactive rather than proactive.

5.3.1.2 Analyzer

The second important informational role of the manager is the analysis of the collected data to add value to offer quality information for the decision makers. Again, the researcher agrees with the importance of this role. He argues that, in the case of the BMOs, data processing should include both types of data. Data needed internally by the organization's decision makers, and, the data needed by the member of the BMOs. Currently the CEO and other managers at the USM do not carry out data analyses to add value to member SMEs. Finally, the researcher believes that this is the most important phase in the information service cycle, as it yields highly value-added information according to member's needs.

5.3.1.3 Disseminator

This is another cycle in the information service loop, it is linked to the communication role of the managers and how they contact the value-added information to decision makers. In the case of the BMOs, managers should communicate the analysed information with the relevant stakeholder. The stakeholders could be internal staff or external members. Currently, the USM communicates with members in several ways such as: emails, Facebook page, short messages (SMS), telephone calls, workshops and others ways. The researcher claims that the USM follows one-to-many communication moods, without any differentiations among members. Meanwhile, SMEs information needs vary and depends of the enterprise itself. Therefore, this requires different communication modes. On the other hand, the researcher as a CEO of the USM plays the spokesperson role of the organization, this aligns with Mintzberg's point of view.

To conclude, the researcher agrees with Mintzberg about the manager's information role which represented in monitoring, analysing and disseminating of information. The researcher concludes that these roles should be carried out for the sake of the internal and external stakeholders in the case of BMOs. In the case of the USM. The researcher ascertains that USM managers underperform this mandate, which is considered as a big gap that should be bridged to improve the USM's information services.

Finally, the researcher would like to raise two important points. First, the researcher affirms that the information role of the organization as an entity is just a translation of the information role of the manager or managers. This means that the BMO has an information role represented in defining, collecting, processing and disseminating the information that is needed by member SMEs to fulfil their decision-making needs. Second, the information role of the manger as remarked by Mintzberg, and which is the

same role of the organization as argued by the researcher could be comparable to the BI process of Dishman and Calof (2007: 779) as cited in Nasri (2011: 27). The figure below presents this comparison:

Dishman and Calof (2007: 779) BI process Mintzberg's Manager Information Role

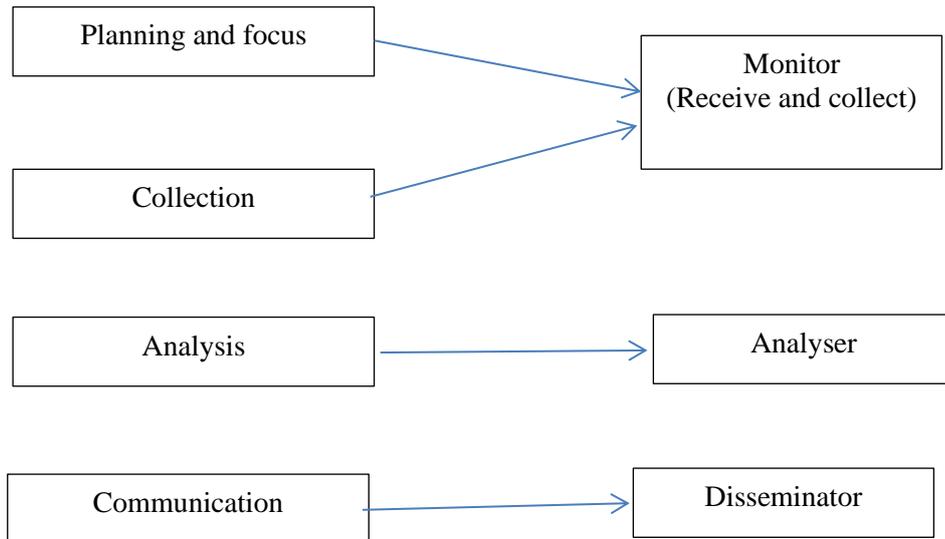


Figure 5.1. comparing BI and the Information role of the managers developed by the researcher. Source: Dishman and Calof (2007) and (Obiefuna, 2014: 100).

The researcher's interpretation of this comparison means that the information role of the manager is similar to run a BI system at an organization. In other words, when a manager carries out his or her information role according to Mintzberg, is resembling the conduction of a BI system.

To conclude, the researcher has accumulated a long professional experience and the academic qualification that enables him to carry out this empirical study. Therefore, it could be argued that he has the domain and methodological knowledge which enables him to play the role of an in-house analyst to lead the implementation of the DAP methodology. This point is supported by the fact that the facilitator and or the analyst

may be external or in-house consultant, who can manage group process and has an experience in modelling (Stewart& Belton, 2002: 8).

In addition to that, we are talking about organizational development, where the organization seeks the support of an expert to audit the organization and to diagnose its different functions. In order to describe the remedies that overcome the problem and through a process that leads to take the optimal decision. This expert should have the methodological tools to deal with the situation. In this study, we assume that the CEO of the USM; the researcher plays the role of the expert. He has the methodological knowledge and the rigor of how to use and apply the Decision Aiding Process (DAP). At the same time, he has a long experience in managing the organization and he is a principal decision maker of the organization. Further analysis about the role of the analyst is discussed later on this chapter.

Considering the above highlighted remarks and building on his own experience, the researcher stresses that implementing the optimal form of a BI system is an important and complex organizational problem, with a unique nature. The researcher argues that the decision makers at the USM are not capable to deal with this problem and need a support from an analyst. Based on the above-mentioned argumentation, the researcher will take the role of implementing the DAP.

From the previous chapters, we saw that provision of the business information to members is a core mandate of any business membership organization (BMO). Regardless of their location, whether, they work in developed or in developing countries. So, this should be applicable in the case of the USM too. The USM states that information services occupy an important position in the hierarchy of the organization's services. But, as we have just explained, this is not the case in reality. Obviously, USM

faces a major problem in carrying out its information services. Therefore, the big question that is raised here, what should the USM do to deal with the situation? And what are the recommendations to overcome this problem?

To answer this question, the most important starting step is to look for the appropriate methodology that lead us to deal with the situation and help the USM decision makers to overcome this problem. In searching for that, two important dimensions should exist in the methodology. First, it should be valid theoretically and appropriate operationally in a real world problem application cases (Bouyssou *et al.*, 2006: 34), like the USM's real case problem.

Let us return to the USM. The organization should follow a rigorous approach to deal with this problem. Why is such an approach needed? Given that, the USM is an organization, where several factors should be considered when take strategic decisions. Strategic decisions require allocating resources and set directions (Labour, 2016). Allocating resources, such as financial and human resources and set directions regarding upgrading of services of the USM such as information services. Many factors should be considered when talking strategic decisions, this include: existence of many decision makers, the huge number of members who are the real co-owners, the USM's structure, organization, human resources, financial resources, networking, information systems, decision making structure and many others. To conclude, the researcher advances that the USM's strategic decision related to its services and the provision of new information services depends on overall organizational aspect.

Therefore, the USM's decision makers should put aside an intuitive or personal approach and follow a more rigorous approach, where formal language and tools are required as stated by Bouyssou *et al.*, (2006). This aligns with the point of view

proposed of Bisdorff *et al.*, (2015: 17-18), who stated that, rigorous tools and methodologies could be adopted to deal with such situation. Furthermore, he stressed that such an approach is needed, and even preferred in similar problem cases, because this approach helps decision makers take satisficing decisions. In the following sections we present the DAP's artefacts in details.

5.4 Artefacts of The Decision Aiding Process

DAP is a process that consists of four artefacts (Bouyssou *et al.*, 2006 & Bisdorff *et al.*, 2015). These artefacts are as follows:

- Problem situation
- Problem formulation
- Evaluation model
- The final recommendation

5.4.1 Problem situation

Supporting someone making a better decision requires clearly understanding the problem situation as a first step in the process. A problem situation could be presented by answering some questions such as: Who faces the problem? Why is it considered as a problem? Who are the deciders on this problem? Why is it really important for the client? What are the deciders' commitments? And, who is going to pay for the consequences of a decision? The answers to these questions help both the decision makers and the analyst to build a common understanding of the situation. On the one hand, this helps the decision makers to understand better their problem and their role within the decision process. On the other hand, it supports the analyst to better understand his role (Bouyssou *et al.*, 2006: 35-36, & Bisdorff, 2015). Finally, it is important to mention that the problem situation is not a unique, or static one, it may

evolve within the decision aiding process depending on the situation (Bisdorff, *et al.*, 2015:21 & Ouerdane, 2006). The problem situation can be presented by the following triplet:

- The set of participants or actors to the decision process; who participates in the decision process?
- The set of stakes (objects) each participant brings within the decision process, in other words, why they participate and what are their concerns.
- The level of commitment for each participant; the set of resources the participants commit to their stakes and the other participants' stakes (Bisdorff *et al.*, 2015: 21 & Bouyssou *et al.*, 2006: 36).

The researcher demonstrates that the problem situation dimension at the Decision Aiding Process could be compared to the work of Mucchielli (1999). *Théorie systémique des communications*. According to Mucchielli, a “situation” is an interaction of five basic contexts.

- First, the *Context of Reference Points* establishes the “acceptable” way that actors can evaluate and act in a given situation (cf. Mucchielli, 1999: 107-110, 160, 164). Typically, *Reference points* involve establishing priorities relating to preferences in a situation. Comparing with DAP, this first context of Mucchielli states who are the actors? What are their points of view expressed in defining their stakes and level of engagements? It could be compared with the second dimension of DAP; the problem formulation, where the actors points of view in each potential actions will be considered, this will be explained in details at the next chapter.
- Second the *situation context* of Mucchielli, is the context of identities involves the intentions, plans, stakes and system of values that actors engage in a given

situation (Mucchielli, 1999: 139-141, 164). This context mentions the stakes of the actors, this is clearly comparable to the problem situation of DAP, where the stakes of the actors should be identified, the values of the actors might be imbedded in those stakes. Furthermore, according to DAP's problem situation dimension, the stakes of different actors could be opposing or in common. Mucchielli's interpretation of that is the actor has a set of identities (professional, cultural, familial, ideological, ...). The identities can be conflicting. For example, depending on the dominant identity/ies, actors will selectively reveal/conceal what they expect to gain/loss in a problem situation.

- The third *context of situation analysis* of Mucchielli, is the context of actors' roles, this is linked to the way in which the obligations and rights – attributed to a “role” – guide the expected/prescribed actions of actors (Mucchielli, 1999: 49-51, 164). An actor has several social roles (professional, cultural, familial, ideological, ...). These roles can impact on how individuals interpret the range and the importance of their different “roles” in a given situation. This can lead to conflict between roles, just as it can reinforce different roles. In DAP, actors' role could be presented by their stakes, level of engagements, their preferences and points of view, in DAP we are mostly interested in the professional role of the actors according to their position in the decision aiding process more than the social role or cognitive way of making decisions, because DAP in itself is a rigorous methodology of helping others to making “satisficing” solutions (Bouyssou, *et al.*, 2006).
- Finally, the *context of actors' interactions* involves the level of trust and confidence, and type of relationships (adversarial, cooperative, neutral, ...) among actors in a situation (Mucchielli 1999: 75-76, 164). Different interactions

can be ambivalent and volatile, if not undetermined. In DAP, it is important to ensure high level of interactions between different actors in order to get common understanding in addition to try reaching a consensus between them. One main important point to highlight in the DAP is that, in many cases the actors in the process might not be the decision makers themselves.

By creating such a comparison between DAP and situation analysis of Mucchielli, the researcher ascertains that this could establish a corner stone in the DAP. Where, understanding of the situation requires understanding the actors, their stakes, values, positions, different roles, is the starting point in understanding the problem situation before embarking to other steps of the process. The researcher acknowledges that this a contribution of the thesis where the theoretical work of Mucchielli and methodology of Decision Aiding Process explains and complements each other's.

To conclude, understanding the problem situation artefact requires the identification of three components: the stakeholders, their stakes and their level of engagement. The researcher acknowledges that the identification of the stakeholders, who take role in the decision making process is the key component of this artefact. The following section sheds light on the stakeholders who take role in this case study.

Stakeholders

The first sub artefact of the problem situation concerns the identification of the participants or the actors involved in the decision making process, the aim here is to answer the following two questions as proposed by Bouyssou, *et al.*, (2006: 35-36).

- Who has the problem?
- Who takes the final decision about the problem, who is responsible?

In general, the initial list of actors is intentionally broad, in order to understand the problem. Thus, it contains direct participants and indirect ones, in addition, it might contain individuals or group of actors. Furthermore, it may include participants from different organizational levels such as strategic, tactic and operational staff. The identification of the stakeholders is a very important task, as this states who can contribute to the decision process and who has the decisional power. Marechal (2013) differentiate between two types of stakeholders who contribute to the decision they are: **The actors:** Those who have indirect role in the decision process. In the current case, the researcher considers the stakeholders outside the USM as actors, those include:

- SMEs representatives: member stone and marble SMEs are considered as the co-owners of the USM, their point of view regarding the BI implementation at USM should be considered, as this decision has a direct impact on their businesses.
- The representatives of *The Stone and Marble Centre at Palestine Polytechnic University*: the USM is a partner at this centre which was created to complement the services of the USM Therefore, the opinion of the staff of USM is considered in the decision regarding the implementation of a BI system and the best approach of carrying out the BIP tasks at USM
- External expert: an expert in information systems and BI is asked to participate in the decision making process regarding the implementation of a BI system at the USM.

The participants: Those who have a direct role in the decision process. The researcher considers the stakeholders inside the USM as participants. this list includes:

- The members of the BoD: They are participants and decision makers; they have a direct role in the decision regarding the BI system implementation and the best approach of how to carry out the BIP tasks.
- The CEO: he is a key decision maker at USM. But as he is carrying out the research and plays the role of the analyst, his point of view is not considered.
- Staff are participants and decision makers at tactical and operational level, they influence the decisions regarding the implementing of BIP tasks.

To conclude, the researcher argues that both types of the stakeholders have to participate in the decision making process regarding the implementation of the proper BI system at the USM. This is because their points of views effect the services of the USM, at the same time they are impacted by the strategic decision taken at the USM.

The stakes and the level of Commitments

Stakes are the concerns of the stakeholders; the researcher argues that the stakes are evolving and could be included and developed in the problem formulation dimension under the stakeholders' point of view, and, then in the evaluation model dimension by the evaluation criteria as will be presented in the next chapter. The same claim is applicable for the level of engagement. Therefore, the researcher will consider the set of the evaluation criteria as the most important stakes of the stakeholders as the set of criteria present the preferences of the stakeholders. The next section presents the problem formulation dimension of the DAP.

5.4.2 Problem Formulation

This section considers the problem formulation's artefact of the Decision Aiding Process (DAP). First, the researcher discusses relevant literature on Decision Aiding (DA) approaches, potential actions, points of views, problem types and the formulation

of a problem statement. Then, he proceeds on formulating the problem statement of the case study.

The main goal of this chapter is to consolidate the understanding of the informational provision problem that USM faces, in addition, this will shape the base for the evaluation model which will be studied in the next chapter. To begin with, this introduction is presented in order to gain an overall overview by raising the following important question.

Are decision makers usually aware of the problem they face? In case where the problem they face is not an ordinary or frequent one.

Before starting the discussion that examines the answer extensively, let us highlight the importance of understanding a problem. Bouyssou *et al.*, (2006: 35) says that “A problem well stated is a problem half solved”. This statement illustrates the importance of structuring and formulating a problem as an initial important step towards finding a proper solution to solve it. Bouyssou *et al.*, (2006) and Bisdorff *et al.*, (2015) argue that several decisions aiding process ends at this stage. Bouyssou *et al.* claim that:

“Supporting decisions should not be limited to solving well established decision models, but should help in facing “softer”, “ill-structured” decision situations that need to be “structured” (2006: 46).

This point of view was supported; that is an understanding of a problem situation as well as formulating a clear problem statement, may be sufficient in some cases to aid decision makers dealing with the situations they face. Furthermore, this gives them a clear understanding of the vague situation they could tackle.

A problem formulation artefact is very important as it establishes the foundation in specifying potential actions or set of solutions, presenting the actors' points of view under which the potential actions are assessed and evaluated and finally formulating a clear problem statement (Bouyssou *et al.*, 2006). Finally, it is worth mentioning that this artefact shapes the base for selecting the needed evaluation model. Tilanus (1983) as cited in (Belton & Stewart, 2002: 35) state that the failure in most operational research interventions originates from the mismatch between the problem and the model used. Similar argumentation addressed by Bouyssou *et al.*, (2006: 46), who cautioned that trying to fit a problem situation to a model might lead to solving the wrong problem correctly. Instead, they stressed that we should formulate the problem first, and then we proceed to choosing the evaluation model. They state: "First set what the problem is and only then consider how to solve it" Bouyssou *et al.* (2006: 46).

The researcher stands with above mentioned opinion that problem formulation artefact should follow the representation of the problem situation and precede the evaluation model. This argumentation is based on the fact that problems vary in their nature; as every problem has its own situation represented by its stakeholders, their stakes and their level of engagement. At the same time, the evaluation model is used to evaluate the potential actions that are developed using different dimensions and a set of criteria. To conclude, the researcher argues that problem should be structured first, and only then, an appropriate evaluation model will be developed, as the problem structure determines the evaluation model and not the contrary as stated by (Tsoukias, 2007)

Let us, now, discuss the literature regarding decision aiding approaches, problem structuring method and methodologies, and problem types.

5.5 Decision Aiding Approaches

In decision aiding process, it is important to shed lights on the rationality models that are used in analysing a given problem. According to Bouyssou *et al.*, (2006) four DA approaches are used to build the rationality models. they are, normative, descriptive, perspective and constructive. The researcher argues that it is important to present and compare each of them in order to determine the most convenient one to our case study.

- **Normative approaches**

In normative approaches, models of rationality are derived from norms established a priori. These norms are intended to be universal such as ethical norms, laws and religious norms. Such norms are supposed to exist in order to behave rationally. They are applicable to all decision makers, because any deviation from them could make mistake for decision makers.

- **Descriptive approaches**

Descriptive approach derives rationality exogenously by observing how decision makers make decisions, such an approach is applicable widely in cases where several decision makers face similar problems.

For normative and descriptive approaches no interaction dialogue is applied between both the analyst, who give decision aiding and the decision maker, who seeks support in making decision.

- **Prescriptive approaches**

This approach discovers the decision maker's endogenous rationality from his reply to the analyst's questions in a specific case, where the client tries to present his own preferences in his dialogue with the analyst. In this approach, the model is not intended to be general, but it unveils endogenously the decision maker specific preferences. The

role of the analyst her is to unveil and understand the client or the decision maker's preferences, meanwhile, no interactive discussion occurs between both of them. On the opposite, in the previous approaches the models are general, where we postulate general norms as in the case of the normative approach, or we observe the behaviour of the decision makers as in the case of the descriptive approach which assumes that decision makers behave similarly in similar approaches.

Constructive approaches

In a constructive approach, the analyst and the client construct and formulate the problem that the client faces as well as both the analyst and the client anticipate to some extent its solution. In this approach, the rationality model is constructed through comprehensive discussions between both agents, the client and the analyst. What differentiates this approach from the previous ones is that this approach does not consider the client's preferences are given and clear *a priori*, rather, the preferences are constructed and validated through discussion sessions, to reach consensus between the two parties. The client expresses his satisfaction where his stakes, points of views and preferences are considered, at the same time the analyst shows his satisfaction that the process agrees with the used methodology. Shortly, MCDA methodology is a clear example of a constructive approach.

Finally, given this explanation, the researcher argues that the constructive approach is more appropriate to this research as a comprehensive discussion between the stakeholders and the analyst is followed from the problem situation until the presentation of the final recommendations This complies with Belton& Stewart (2002:35), who states that DAP is viewed as a constructive model and seeks to help

decision makers understand and define their preferences. DAP is not a descriptive approach that describes what decision makers do to elicit their preferences.

5.5.1 Problem structuring

In the following section, the researcher presents some of the most important problem structuring and formulating method. these include: cognitive mapping, strategic choice and value focused thinking as shown in the following subsections.

- **Cognitive-mapping**

This method shows how a client perceives a set of issues and how he or she expects to act on them. The analyst develops a cognitive map by conducting one or more interviews with the client. This tool is difficult to implement when we have several clients or actors with different issues and stakes (Ishizaka& Nemery, 2013). From Information and Communication point of view, the researcher might define “cognitive” as a as a person’s ability to transform “a set of raw data” into “meaningfully organized data” called “information”. While, cognitive map might be defined as a topology linking up different meaningful points.

For this reason, the researcher believes that this method is difficult to be implemented in our case giving the number of actors and their divergent stakes and points of view.

- **Strategic Choice Process**

This method is expected to deal with the complexity of interconnected decision problem characterized by large uncertainties. The method consists of four modes of decision making, these modes are as follows:

1. Shaping mode: This mode deals with structuring the set of decision problem. or you can say shaping mode: in that structuring the set of decision problem is concerned.

2. Designing mode: where the feasible actions are developed
3. Comparing mode: to compare different actions, according to set of criteria
4. Choosing mode: where decision makers look for argumentation to choose the best actions. the researcher argues that this mode should be defined as Deciding mode, as decision encompasses the selection.

Bouyssou *et. al*, (2006: 48) argues that this method is precisely used in a case where participants are the decision makers. The method is applied through a decision aiding workshop, where every participant's point of view is written and discussed with other participants. The researcher acknowledges that this is an important method that enhances the communication between different participants which enhances the common understanding of different participants points of views.

The result of the method is not only the deliverables of actions or policies, but also could be considered a new approach of exploring organizational decision process. In spite of the importance of this method, the researcher argues that it might not be the best choice in structuring the problem that USM faces, keeping in mind the existence of many participants from representing many entities, with different stakes and points of views.

- **Value- focused thinking**

Keeney (1992) states that decision makers usually focus their attention on evaluating alternatives, rather than identifying firstly their own values. In his famous book; *Value –Focused Thinking*, Keeney (1992), emphasizes that values are more fundamental than alternatives in decision making. He states that: “Value are what we care about, as such, values should be the driving force for our decision making”.

He states also, that

“The promise is that focusing early and deeply on values when facing difficult problems will lead to more desirable consequences, and even to more appealing

problems than the ones we currently face, we should spend more of our decision making time concentrating on what is important...to create better alternatives than those already identified. And, to evaluate more carefully the desirability of the alternatives” (Keeney, 1992 :3-4).

Keeney (1992) differentiates between both approaches. He stated that in value-focused thinking the concentration is on what we want and to figure out how to get it. On contrary, in alternative-focused thinking, specifying what alternatives is available and choosing the best one is the key point. Keeney (1992) recaps that in value-focused thinking we start from the best and work towards making it reality. However, in alternative-focused thinking, we start with what is already available and taking the best one.

The researcher agrees with Keeney (1992), that what is important and what motivates our decisions are not the potential actions or solutions in first place. Instead, we should start with what we care about, it is our values represented by our objectives. Then we move forward how we can achieve these goals.

From his side, the researcher believes that value- focused thinking is the most practical method to USM researched case, as the problem that required to be solved originates from the USM informational objectives that are not achieved as perceived by USM member companies. In other word, this constitutes the problem where a decision must be made. Then, this leads us to think about the alternatives or potential actions that could be the solution. What configuration of a Business Intelligence (BI) system is more appropriate to overcome this informational services deficiency of the USM? This leads us to focus on the problem types where the DAP is necessary to deal with.

5.6 Problem Formulation Artefacts

The second artefact of the DAP is the problem formulation, for a given problem situation, one or more problem formulation might be suggested. The problem formulation reduces the ambiguity of the problem situation into a formal problem (Bisdorff *et al.*, 2015: 21). From his perspective, Bouyssou *et al.*, (2006:46) states that problem formulation is a crucial step in the DAP that translates the client's concern into a formal problem for which the DAP can be applied.

According to Tsoukias (2005), a problem formulation can be conceived as a triplet consisting of: potential actions, set of points of views and the problem statement. In the following part we introduce the literature regarding each of them, then we proceed to define them as agreed upon between the actors and the researcher.

5.6.1 The Potential Actions

A: is a set of potential actions that can be undertaken by the client with respect to the problem situation P.

Potential actions are called decision variables, alternatives or potential decisions. These potential actions are developed through answering the question: what we decide about? This question should be answered with sufficient clarity based on the available information. This information comes from the client himself, or from the stakeholders and their concerns as presented in the problem situation analysis. The decision maker himself might be able to define some potential actions. However, in most cases potential actions do not already exist somewhere, but it has to be constructed from available or yet to be expressed information (Bouyssou *et al.*, 2006).

The USM's BoD members and staff might be able to develop some potential actions. While, as we follow a constructive approach, the researcher can propose all possible potential actions and discuss them with the stakeholders. The researcher ascertains that

his experience, methodological skills enables him to develop these options. Based on that the researcher proposes following alternatives:

- **Option One: Outsourcing the information services**

This option points to completely outsourcing the information services of the USM. This alternative means that no BI system is required to be implemented within the USM. On contrast, an external body can be delegated to run all BIP tasks.

To evaluate this option, the stakeholders and the researcher refers back to the SWOT analysis of the USM presented in chapter 3. Even though, the USM has an opportunity to benefit from the capabilities of external bodies or experts and it can enhance the networking of the organization. Meanwhile, this option bears threat for the USM due to many reasons: First, delegating an external body to collect and analyse business data is a risky option as it concerns with important and intelligence information. Second, this option prohibits the USM from building its human resources and limits the organizational learning. Finally, this option effects the brand name of the USM amongst its members, this may lead members to withdraw their membership from the USM as their perceptions towards the organization might be drew back. This potential action will be considered in next chapter to see whether is it valid for some BIP task or not.

- **Option two: Upgrading The Information Services of USM Internally “Do It Yourself”, (DIY).**

This alternative considers that the USM has to implement a BI system internally without any cooperation with external bodies. To analyse this option, the stakeholders with the support of the researcher refers back to the SWOT analysis of the USM. They argue that USM does not have the resources, capabilities and experience to run all BIP tasks alone. In addition, this prevents the USM to benefit from the available resources with

partner organizations and institutions such as the capabilities of the Stone and Marble Centre (PSMC) at Palestine Polytechnic University (PPU). Similar to option one, this option will be reconsidered in chapter 5 to assess whether it is valid for some tasks of the BIP or not.

- **Option Three: Develop and Implement a BI System in Collaboration With External Bodies.**

This alternative assumes that the USM has to run the tasks of the BIP in collaboration with other bodies, such as PCMC and external experts. The stakeholders analyse this option and come into a result that it is the optimal option as it the USM can follow. From one side, this option enables the USM to benefit from the resources available at partner organizations, which means that the USM can work in synergy with other organizations. In addition, it allows the organizational learning of the USM to accumulate the skills needed. Furthermore, the USM can enhance its brand name as the organization still a main player in running the system. The stakeholders acknowledge that this option merges both option one and two. This alternative means that for each BI task three option are available, they are: **DIY**, **Outsource** and **Collaborate**. Such options, then are evaluated against set of criteria to see which is the optimal solution for each BI task. This evaluation will be presented in details in chapter five.

Finally, it is worth mentioning that the final set of potential actions will not be fixed until the establishment of the evaluation model, which means that it is an evolving process.

5.6.2 The Set of Points of View

The set of points of view from which the potential actions are observed, analysed, evaluated, and compared. The set of points of view is generally derived from two sources of information. The first source is the stakes of the stakeholders. The second

source is the commitment of the stakeholders. Finally, it is important to mention that the points of view at this stage are not fixed, rather, they show what a client knows or wishes to know about the potential actions (Bouyssou *et al.*, 2006:54).

For this study, the researcher proposes that the set of points of view could be derived from the BI implementation Critical Success Factors (CSF) presented in chapter two. This is an important contribution of this research. Moreover, the set of points of view are evolved to the set of evaluation criteria, this will be studied in details in next chapter.

5.6.3 The Problem Statement

The problem statement anticipates what is expected to be done with the potential actions. Bouyssou *et al.*, (2006: 55) distinguish three cases that should be considered before starting the formalization of the problem statement. In the first case, the mission is limited to the construction of feasible potential actions without any further analysis. While, in the second case further description of the potential actions under precise points of view is required. Finally, the most usual and important case is called purposeful or operational problem statement, where the potential actions are partitioned into categories. The last case implies that the problem statement should clearly show what is needed to be done with the potential actions. In operational research, researchers mostly focus their attention on three types of problem statements (Bisdorff *et al.*, 2015) they are:

- **The Optimization or “Choice” Problem Statement:**

At this type, only one potential action is needed to be selected as a solution for the problem, while, other potential actions are discarded.

- **The “Rank-order” Problem Statement:**

In this type of problem statement, the potential actions are needed to be ranked:
The first, the second, the third, etc.

- **The *Classifying or Sorting* Problem Statement**

Here, the potential actions are needed to be classify into categories, either categories are pre ordered or not, or, pre-existing or not.

Finally, it is worth mentioning that the formulation of the problem statement is not an easy mission so that the client can carry it out by himself, instead, it is the main mission of the analyst, who should propose different possible problem statements and their different outcomes. Problem formulation is a crucial issue in the DAP, as it anticipates different possible conclusion of the whole process.

Considering the above theoretical background of the formulation of the problem statement. The participants with the support of the analyst or the researcher claim that we are confronting an outranking problem statement. This means that the decision makers have to decide about the ranking of the potential actions (DIY, Outsource, Collaborate) for each BI task (identification of the information needs of the stone and marble SMEs, collect the data, analyze the data, and communicate the value-added information and intelligence). The researcher argues that this type of problem statement most fit this case study as the second or third option might be selected and argued. On the other hand, the researcher claims that it is neither a “*Choice*” problem as only one potential action is selected, while others are discarded. This problem statement type is not suitable and might be criticized. Nor, the problem statement is a classifying one, that requires the sorting of the potential actions into different categories.

5.7 Conclusion

To conclude, The USM underperforms its information services to its members which contradicts with its mandates. Consequently, the USM faces an organizational problem of a strategic nature that has an impact over hundreds of members. Therefore, the decision makers at the USM has to employ a methodology to find an optimal solution for this problem. Meanwhile, the researcher criticizes the capability of USM' s decision makers to find a solution for this problem by themselves. As a result, the decision makers at the USM needs a support from an expert to lead them take a decision regarding this problem. It is argued that the researcher himself has the methodological tools and techniques to carry this mission. The researcher ascertains that the Decision Aiding Process (DAP) is an appropriate research methodology for this case study.

DAP consists of four dimensions.

In this chapter, the researcher presented the problem situation, and the problem formulation dimensions. Finally, the problem statement was formulated. It is a ranking problem statement which means that the decision makers have to decide upon the ranking of the potential actions. In the following chapter, the evaluation model will be presented. This model is developed to evaluate the above-mentioned potential actions for each BIP task against set of evaluation criteria.

CHAPTER 6

EVALUATION MODEL AND DATA ANALYSES

6.1 Introduction

This chapter sheds the light on the evaluation model that will be constructed to obtain a formal answer to the problem statement developed in previous chapter. The researcher presents three main detailed procedures: First, the chapter gives insights into the literature related to the evaluation model. Second, the chapter discusses the method of data collection needed to construct the evaluation model for the displayed case. Finally, the analyses and the evaluation of the alternatives for each Business Intelligence Process (BIP) task will be presented thoroughly. This evaluation establishes the bases for the final recommendations that will be discussed next chapter.

6.2 Evaluation Model

For a specific problem formulation, an evaluation model is constructed to organize the available information in order to obtain a formal answer to the decision problem discussed in a problem statement, this designated model consists of 5- tuples (Bouyssou *et al.*, 2006:42), which are: the set of alternatives, the set of dimension, the scale of measurement for each dimension, the set of criteria, the set of uncertainty, and the set of operator. The following sections discuss each of these items in detail.

6.2.1 The Set of Alternatives

the set of potential decisions or alternatives, on which the model is applied, are basically derived from the set of potential actions presented in the problem formulation artefact, while new elements might be added or eliminated with regard to the evolution of the

decision aiding process. According to *Visual Promethee* Manual, an “action” points to a possible decision or an item for evaluations (*Visual Promethee*, 2013: 16).

6.2.2 The Set of Dimensions

A dimension or an attribute is the relevant empirical knowledge available or collected about a particular alternative, under which such an alternative is observed, assessed, and evaluated. This set of dimensions should not be empty, with one dimension exists at least. For example, when buying a car many dimensions are considered. Economic dimensions include, price, terms of payment, consumptions, cost of maintenance. Quality dimensions include, comfort, luggage capacity, etc. (Bouyssou *et al.*, 2006 :42-57).

6.2.3 The scale of measurement

Each dimension is associated with a scale of measurement which indicates its value. The scale might be quantitative such as the price of an item, or a qualitative such as a 5 ordered scale rating such as: very good, good, average, bad, and very bad. (*Visual Promethee*, 2013: 19). Or, it might be an ordinal or nominal scale (Roy, 2000; Bouyssou *et al.*, 2006:42). Simultaneously, a dimension can be measured quantitatively such as the price of an item is measured by an amount of money, or qualitatively such as the comfortability which might be measured by 5-point ordered scales such as: very good, good, average, bad and very bad (*Visual Promethee*, 2013: 17).

6.2.4 The Set of Criteria

Criterion is: “a principle or standard by which something may be judged or decided”¹.

In the multi criteria decision aiding context, a criterion is defined as: “any dimension to which it is possible to associate a preference mode” (Bouyssou *et al.*, 2006: 57). A criterion or an attribute is used to compare actions (*Visual Promethee*: 17). The researcher agrees with the two definitions and perceives that the set of criteria is a sub-set of dimensions or attributes used as a tool to compare and evaluate actions. At the same time, it represents the decision maker’s preferences or desires by allocating a specific weight and determining a threshold for each criterion.

Bouyssou *et al.*, (2006) differentiate between dimension and criteria, as the dimensions describe the alternatives, but indicate nothing about the preferences of the decision maker. On the contrary, the preferences or desires of the client are explicitly presented in the criteria which are usually sub-set of the set of dimensions.

6.2.5 The Set of Uncertainty

It is salient that uncertainty is linked to the relations and functions applied to the potential actions. In addition to different possible scenarios, it is also associated to the imprecision and inaccuracy that should be taken in consideration through the analyses (Bouyssou *et al.*, 2006: 6-41). Given the Multi Criteria Decision Aiding (MCDA) literature, it is significant that uncertainty is associated to what is called sensitivity analyses which is mainly linked to performing different weight analysis of the evaluation criteria and to observe how this variation impacts on the outranking of

¹ <https://en.oxforddictionaries.com/definition/criterion>

different alternatives (Visual Promethee, 2013: 71). In brief, before giving his or her last recommendation, the analyst should take into account the impact of factors such as missing data, imprecision, different scenarios, decision maker's hesitation, and criteria weights variations on the outranking of different actions. Once again, this is an important issue as it might impact the final decision.

6.2.6 The Set of Operators

The set of operators synthesizes all information about the alternatives to perform the final evaluation. This includes the weights of the criteria and their thresholds. It is important to mention that the selection of this method or technique is not neutral and depends on the problem statement adopted in the problem formulation stage (Bouyssou *et al.*, 2006: 41-59). In brief, the problem statement indicates the technique that will be used as some techniques are suitable for “*Choice*” problem statement, while others fit the “*Outranking*” problems as well as for sorting types of problems.

To generate the data needed to build the evaluation model, in the following section, the researcher sheds light on most appropriate research methods that will be used.

6.3 The Research Method

This section considers the “technical” approach or method that will be used to gather the required data for developing and constructing the evaluation model related to the current case study. First, the researcher presents the relevant literature regarding the potential research method that is appropriate to the current case study.

Due to the existence of many groups of stakeholders as explained in the previous chapter, the researcher can adopt either one of two approaches in the current study. The first approach is collecting data from each group separately, which is indicative of the development of an evaluation model for each group. This approach reveals that different

scenarios lead to different solutions for the same problem statement mentioned in the previous chapter. While, the second approach suggests that all stakeholders' collective points of view should be taken into consideration together. This means trying to get a consensus among stakeholders to develop and construct one evaluation model that synthesizes their points of view together. This approach represents one scenario that leads to one formal solution for the established problem statement. The researcher argues that the collective approach is the most appropriate and practical one. This is because our aim is not comparing between different scenarios, rather, it is to show how a business intelligence process could be put in place at USM based on a consensus approach that synthesizes different actors' points of view.

Based on this, the researcher ascertains that a consensus research method is highly recommended for the current case study. Habibi (2014), states that the “*Delphi* technique is a group knowledge acquisition method, which is also used for qualitative issue decision-makings”. Therefore, the researcher advances that *Delphi* is one of the consensus techniques that could be appropriate for the current case study. The following section presents a detailed account with regard to this method. and how it is applied.

6.3.1 *Delphi* Technique

According to Avella (2016), the *Delphi* method falls under a consensus development technique when there is limited evidence about a specific topic, or in areas with little prior research. From his perspective, Davidson (2013) states that the *Delphi* technique is widely used amongst PhD students. The method comes under many labels or names such as a technique, a process, a method, an exercise or a survey. Davidson (2013) adds that the *Delphi* technique has many advantages such as the ability to define a problem with limited knowledge, in addition to clarification through iteration and rounds.

Both researchers, Avella (2016) and Davidson (2013) classify the method into different versions or types based on their purpose, such as: a policy Delphi, which is suitable for proposing a strategy to address a specific problem. While, classical *Delphi* is used to forecast the future; and finally, decision making *Delphi* is used to achieve better group decision-making. According to Avella (2016), it is a tool for obtaining group opinion about a specific topic, or as a means for the analysis of a social situation (Davidson, 2013). Furthermore, Habibi *et al.*, (2014) state that *Delphi* is a qualitative decision-making technique. Based on these opinions, the researcher believes that Decision making *Delphi* is an appropriate technique for the current case study. This method synthesizes different group opinions into one consensus scenario and gets the data needed for building the evaluation model.

In the following sections, the researcher sheds light on the initial phases of the Delphi process implementation. This consists of problem definition, panel selection, consensus measurements, and conducting the panel round.

6.3.1.1 Problem Definition/ The Objective of Using Delphi:

Avella (2016) states that a *Delphi* round should start by posing a problem statement that generates the research question or questions used to obtain data from the panel members. In the current case study, the questions addressed to the panel members are concerned with the selection of evaluation criteria, their weights and threshold and the performance for each alternative against each criterion. This is presented in later sections of this chapter.

6.3.1.2 Panel Selection and Panel Size

The panel members are based on the objective of the study, in general, *Delphi* researchers employ a purposeful sampling strategy, and panel members are intentionally

selected for the purpose of applying their knowledge to the studied topic (*Cowan, D., et al., 2013*). The researcher agrees with this point of view as the panel members are intentionally selected based on their knowledge and experience. This purposefully selection enables the researcher to collect the data from the right persons

To meet the objective of the present case study, the researcher establishes some criteria for selecting a panel member, these criteria are:

1. Has more than 5 years of experience in their fields. this experience enables them to elaborate to the case study.
2. Has knowledge of USM services in general and information services in particular. Because this study is directly linked to the USM's information services.
3. Being an active board member of the organization for the board of directors' representatives. Because, non-active members contribution is always very limited.
4. Being an active member for the SMEs owners' representatives. Such type of persons, to some extent are able to define their information needs, give feedback and can evaluate the information services of the USM.
5. Being a branch manager for USM staff. As managers always are more capable than low level or junior staff.
6. Being a staff member at Palestine Stone and Marble Centre at Palestine Polytechnic University. This criterion is applicable for the representative of the PSMC.

7. Being an expert in the field of information system and institutional building for the external experts. External consultant or expert in the field might elaborate in the evaluation process based on their experience and knowledge.

It is worth mentioning that, not all criterion should exist in a person to be selected in the panel. Some criteria are applicable to some members and not for others.

To put in place the *Delphi* process, the researcher purposefully invited a panel of twelve actors representing different stakeholders' groups as presented in the previous chapter. This selection is based on the researcher's knowledge and experience, in addition, it is worth mentioning that the researcher was able to bring this group together since he has the organizational power at USM as he occupies the position of the Chief Executive Officer for more than 10 years. However, this is not an easy mission for most researchers as stated by Avella, (2016). In this case study, the researcher can convince the participants about the importance of this research as it might have a practical impact over the USM's services. The participants' distributions are as follows:

- Three members representing USM board of directors.
- Three members representing USM staff
- Two staff representing Palestine Stone and Marble Centre at Palestine Polytechnic University
- Three members representing stone and marble company directors or owners
- One expert in the field of information system.

It is worth mentioning that there is no fixed number for a *Delphi* panel size. The number varies from one study to another depending on the objective of the study Avella (2016) & Habibi et al. (2014). However, the researcher contends that the panel size of 12 people

is sufficient to meet the study's goal, as getting a consensus for a bigger panel in the context of the current study would have been too difficult due to their limited experience of using such techniques. The following sections highlight the consensus concept and conducting a panel process.

6.3.1.3 Establishing a Consensus

According to Aigboavboa (2015), a consensus is difficult to measure in *Delphi*, as there is no consensus of how to determine consensus regarding some alternatives. Some scholars, such as Vernon (2009), states that reaching 70% of concurrence is necessary for consensus, others like Avella (2016) argues that consensus varies from 55-100%. In the present study, the researcher agrees to some extent with the opinion of Vernon (2009), as a consensus is considered to be reached if more than two third or 66% of responses are compatible regarding the options. The researcher adapts this percentage as lesser percentage presents neutral opinion, such as 55%. On the opposite, getting high percentage 75% or above is not attainable considering the divergent of the participants.

6.3.1.4 Conducting the Panel Iterations/ Rounds

In the previous sections, the researcher presented the rationale behind the selection of a Decision-making *Delphi* method. It was for practical reasons to reach a consensus regarding the evaluation model items. The following section presents in details the way how a panel is conducted. Then applying the panel to this case study.

A *Delphi* process consists of several rounds. Two rounds at least¹. From his perspective, Avella (2016) argues that the number of rounds is not the aim, but rather getting a

¹ <http://www.foresight-platform.eu/community/forlearn/how-to-do-foresight/methods/classical-delphi/>

consensus. In this case, however, to reach the goals of the study, the researcher proposes three rounds as follows:

- **The First Round:** Based on knowledge gained from previous studies, this step might be named as a *literature review*. This argumentation is widely supported as many researchers have argued that a literature review occurs in the first round of the technique and could replace it as well. For example, Aigbavboa (2015) states that the process starts with an extensive literature review to put on the table the main variables regarding the studied topic. A similar point is presented by Avella (2016) who claims that a literature review is essential and might replace the first round. These observations were key points of agreement.

From his perspective, the researcher supports the point of view that the literature review could replace the first round of the panel. He believes, that the analyst should review the related literature first. The result of this review, then presented to the panel members to start the consensus process. This point of view is valid for this case study. For example, to generate a set of the evaluation criteria, the researcher reviews the literature about BI implementation Critical Success Factors (CSF). He synthesizes a short list of the BI implementation CSFs. This short list then is presented to the panel members (the second round).

- **The Second Round:** In this round, the previously generated short list of the Critical Success Factors (CSFs) of BI implementation are presented to the panel members during a decision aiding workshop in written format. Panel members are asked to discuss this list and to agree upon the most relative sub-set of these CSFs that could be considered as the final set of the criteria

- **The Third Round:** In this round, the mission of the panel members is limited to:
 - a. Giving a weight for each criterion that reflects its preferences for the decision makers
 - b. Determining a weight for each criterion
 - c. Evaluating each preference against each criterion

The following sections display how this method is employed to generate the data needed to construct the MCDA evaluation model of the set case study.

6.4 Building an Evaluation Model for Business Intelligence Process Tasks

In this section, the researcher presents how the evaluation model items for the current case study were constructed, starting. First, the researcher shows how the set of alternatives was developed. Second, he illustrates how the set of criteria were developed, and finally, how the evaluation of each alternative was displayed.

6.4.1 The Set of Alternatives for Business Intelligence Process Tasks

It is noticeable from the previous chapter that the potential actions for performing each BIP task at USM, could be carried out by one of the following three approaches:

- Do It Yourself (DIY): this means that USM will carry out this mission by its own capabilities and resources alone.
- Outsourcing: to outsource the BIP task to an external body
- Collaboration: to perform the task by more than one body,

Based on these general potential actions, the researcher defined all possible alternatives by decomposing the outsourcing and collaborating potential actions and merge them with the “DIY” to its possible alternatives. This facilitates the analysis of the alternatives

as each of them should stand alone. The set of all possible alternatives for each BIP task are as follows:

- Do It yourself (DIY): To completely perform the task by **USM** staff only
- Outsource 1: Delegate the task to Palestine Stone and Marble Centre (**PSMC**) at Palestine Polytechnic University (PPU)
- Outsource 2: Delegate the task to a consultancy firm (**Expert**)
- Outsource 3: Delegate the task to both the PSMC at the PPU and a consultancy firm (expert). shortly, (**PSMC+ Expert**)
- Collaborate 1: the USM and the PSMC at the PPU. Shortly, (**USM+ PSMC**)
- Collaborate 2: the USM and a consultancy firm. Shortly, (**USM+ Expert**)
- Collaborate 3: USM, the PSMC at PPU and a consultancy firm (expert). shortly this alternative is called (*ALL*)

After developing all the potential actions, the purpose of the next step is to define both the set of dimensions, set of criteria and scale of measurement and the needed for the evaluation of the alternatives.

6.4.2 The Set of Dimensions for Business Intelligence Process Tasks

In the current study, the researcher argues that defining all the dimensions related to BIP task implementation and their associated scales is a challenging task. First, according to the researcher, no such set of dimensions about this topic is presented in the literature, and this exceeds the scope of this study. Second, ultimately, the alternatives are evaluated against a set of criteria that are derived from the set of dimensions. Therefore, the researcher contends that it is much more practical and

rational to investigate the set of criteria directly, rather than considering an extensive set of dimensions.

The following section explains the method used in developing the set of criteria in addition to the set of criteria that achieved consensus amongst the stakeholders.

6.4.3 The Set of Criteria for Business Intelligence Process Tasks

The following section sheds light on the research methods used to develop and generate a set of criteria that will be used in constructing the current study's evaluation model. A set of criteria might be developed through various ways. One way is to examine the secondary resource information and literature about the topic. Another way is to investigate the policy statement of the organization. A third way for generating criteria is through the engagement of the stakeholders in a workshop to derive a relevant set of them. Finally, experienced participants of the stakeholders were asked to develop a set of criteria (Multi Criteria Analysis: A manual, 2009: 33).

Therefore, the researcher argues that a combination of research approaches is important in developing these sets of criteria. First, the researcher reviewed the literature about a BIP implementation CSF (see chapter 3) which might be employed as a practical set of criteria. Then a Delphi rounds or what could be called "decision workshop" is organized.

Based on the literature review about the BI implementation CSFs. The researcher argues that most CSFs of BI implementation are more theoretical rather than practical. Therefore, they are not seen to be appropriate to be used as evaluation criteria. For considering a CSF an evaluation criterion, it should be a practical and at least could be measured on a qualitative sense (Belton & Stewart, 2000; Bouyssou *et al.*, 2006; Multi criteria analyses: A manual, 2009).

Given this methodological approach, the researcher based on his professional experience and by reviewing the USM’s goals and objectives and SWOT analysis (see chapter 4), in addition to reviewing the CSFs for a BI implementation presented in chapter 3. formulate a short list of BI implementation CSFs that were provided to the *Delphi* panel (table 6.1) below, accompanying with the following questions:

Would you please select the 3 top-ranked practical criteria for evaluating the alternatives of performing each BIP task at the USM?

Would you please indicate the importance of the selected criteria by allocating a specific weight for each criterion?

After an extensive discussion among the panel members during the second *Delphi* process, a sub-set of criteria are derived from the BI implementation Critical Success Factors (CSF). These criteria are selected based on the consensus method presented before. As presented earlier in this chapter, consensus does not mean 100% of agreement, but rather a two third score is considered as a good result. This consensus threshold took into account the panel members’ different background and the non-homogeneity of the stakeholders. A final consensus set of criteria allocated to different BI task are presented in the following table.

Table 6.1 *The potential set of criteria for evaluating BIP tasks*

The BI implementation CSFs	BIP Task	Consensus set of Criteria
	Identifying information needs	Team Capability
		Experience
		Cost

Management support Availability of staff Team skills IT infrastructure/ BI technical readiness	Identifying Data sources and data collection	Accessibility to data sources
		Capability of the team
		Cost
Networking and cooperation Brand image Cost Organizational culture	Data analyses	Human factors (education, technology, capability and experience)
		IT infrastructure
		Cost
motivation	Communication and getting feed back	Brand image
		Communication effectiveness
		Cost

Finally, it is worth noting that this approach was used to ensure the professionalism of developing a practical set of criteria from very broad theoretical CSFs of BI implementation. The method is considered a significant contribution of this research of how evaluation set of criteria might be developed for a practical case study.

Once, the set of criteria are identified, a proper methodology should be used to evaluate each of them. the following section presents the *Promethee* as a MCDA methodology to evaluate alternatives against the selected set of criteria for each BI task.

6.5 The *Promethee* Methodology

The outranking *PROMETHEE-GAIA* MCDA methodology is used to perform the evaluation of different alternatives for BIP tasks. This methodology is supported by a software called *Visual Promethee*, it was developed at the *Brussels Open University*. *Visual Promethee* has three versions: The *Demo* Version is free of charge and is used

for bingers. While, the *Business* Version is for business purposes and it is available against some fees. Finally, the *Academic* versions is available for free for researcher and PhD students. In this research, the Academic version of this methodology is used. Before embarking into our analysis, let us keep in mind that two approaches might be used. The first approach, which was used in this case study is to employ a Delphi method to get a consensus amongst different actors about the set of criteria, their weights, their thresholds and finally to evaluate the performance of the alternatives collectively, as one overall point of view. This leads to one evaluation model for all participants, or, what could be called one scenario approach. Conversely, the second approach assumes that we build an evaluation model for each group of actors, where they can use different criteria, different weights, different thresholds. Consequently, this leads to the allocation of different values for the performance of each alternative. Finally, we get many solutions, and the consensus emerges at the final stage.

The rationale behind selecting the one scenario approach is that it is more practical, as all decision makers are brought together into *Delphi* panels to seek a consensus for each step. While, the multi scenario approach would have led to different solutions and it would have been extremely difficult to get a consensus after different decisions have been reached by different groups.

The step that follows is the construction of the evaluation model for each BIP task.

These tasks are:

1. The identification of business information needs,
2. Data collection,
3. Data analyses, and
4. Communication and feedback.

For each task, the panel members were asked to agree on the set of criteria, the weight and the thresholds for each criterion, and to assess the performance of each alternative against a specific criterion. These generated data are needed to construct the evaluation model for each task in order to get a formal solution.

6.6 Task1: The Evaluation Model of the Identification of the Business Information Needs

This task is related to the ability of identifying the information needs of USM itself and those of the stone and marble SMEs. Such information types like marketing information, legislations, technology and know-how were presented in chapter 2.

Therefore, our problem that seek to find a formal solution is:

What is the best way to of carry out the information collection task? Can USM depends on its own capabilities perform this task alone (DIY). Or, does it need to outsource this task (Completely Outsource). Or, should USM collaborate with external bodies (collaborations)?

To start the analysis, the set of alternatives, the evaluation criteria and the evaluation of the performance of each alternative against each criterion are to be identified, the following sections explains these topics.

6.6.1 The Set of Alternatives for the Identification of the Business Information Needs

Above in this chapter, seven alternatives of how to perform a BIP task have been identified. These are:

1. Do it yourself: To completely perform the task by USM's staff only (*USM*)
2. Delegate the task to Palestine Stone and Marble Centre at Palestine Polytechnic University (*PSMC*)
3. Delegate the task to a consultancy firm (*Expert*)

4. Union of Stone and Marble and Palestine Stone and Marble Centre at Palestine Polytechnic University (*USM* and *PSMC*)
5. USM and a consultancy firm (*USM+ Expert*)
6. Delegate the task to both the Palestine Stone and Marble Centre at the PPU and a consultancy firm (*PSMC+ Expert*)
7. Collaborate 3: USM, PSMC and a consultancy firm (*ALL*)

6.6.2 The Set of Criteria Alternatives for the Identification of the Business Information Needs

The evaluation set of criteria for this task, as identified by the decision makers (see table above) are, capability, experience and cost of performing the task. The following section sheds light on each of them.

6.6.2.1 The Capability to Define Information Needs (Criterion 1)

This criterion evaluates the capabilities of each alternative. It points to the staff who perform the task and their professional level, senior or junior. This criterion was to be maximized, in other words, an alternative with higher capabilities was likely to perform better than lesser capabilities. This criterion calls for a qualitative scale, due to the difficulty of measuring this criterion in a quantitative scale. Here, the decision makers agree on a classical 5-point order scale: very bad, bad, average, good and very good. This scale is expressed by numbers from one to five, one points to very bad, while five points to very good.

6.6.2.2 The Experience to Define Information Needs (Criterion 2)

This criterion points to the experience of the staff of each alternative related to the information needs of stone SMEs. This criterion was to be maximized, in other words, an alternative with higher experience is likely to be better than others. This criterion

calls for qualitative scale, due to the difficulty of measuring it in a quantitative scale. A classical 5-point order scale: very bad, bad, average, good and very good is used.

6.6.2.3 The Cost of Defining Information Needs (Criterion 3)

This criterion evaluates the overall cost occurred for performing the task of business information identification. This criterion was to be minimized, in other words, an alternative with a lower cost was likely to be better than others. This criterion should be expressed in a quantitative scale, but, due to the difficulty of measuring it quantitatively, a similar qualitative classical 5-point order scale: very bad, bad, average, good and very good was used.

6.6.3 The Thresholds and Preference Functions of The Criteria for Business Information Identification Task

6.6.3.1 Thresholds

Decision makers might associate a preference threshold or thresholds for each criterion.

Indifference threshold: This threshold means that decision makers neglects the differences between two alternatives if the difference between their performance values is less than this indifference threshold. In such a case that decision maker does not prefer an alternative over the other. The indifference thresholds are: 0.25 for both capability and experience criteria and 0.5 for the cost criterion.

Preference threshold: This threshold points to the difference value between the performance values of two alternatives when exceeded the decision maker fully prefers one alternative over the other. The preference thresholds are: 0.5 for both capability and experience criteria and 1 for the cost criterion. It is worth mentioning that the maximum values of the alternatives.

Table 6.2 below displays the indifference and preference thresholds associated to each criterion.

6.6.3.2 The Preference Functions

In addition, *Visual Promethee* requires to associate a preference function to each criterion. A preference function translates the differences between two alternatives into zero to one, or, from indifference to full preference value (Lolli *et al.*, 2019; *Visual Promethee*, 2013: 149). The researcher argues that a linear preference function is proposed for all criteria. The linear preference function neglects the difference between two alternatives if it is less than the indifference threshold this means that the preference equals to zero. On the other hand, linear preference function computes the preferences at the weak preference level; when the difference between two alternatives exceeds the indifference threshold and less than the preference threshold, this means that the preference is more than zero and less than one. Finally, this function considers the full preference, when the difference between two alternatives exceeds the preference threshold, this leads to a full preference equals to one. The following table presents the set of criteria, their weights, the thresholds in addition to the scale of measurement each criterion.

Table 6.2 *The set of criteria for the business intelligence process's data collection task.*

Criterion	Weight	Scale of measurement	Indifference threshold (q)	Preference threshold (p)
capability	25%	Qualitative scale, Likert 5 orders	0,25	0,50
experience	25%	Qualitative scale, Likert 5 orders	0,25	0,50
Cost	50%	Qualitative scale, Likert 5 orders	0,50	1

The linear preference function takes the difference into consideration when it exceeds the indifference threshold and below the preference threshold (0,25-0,5) for both the capability and experience criteria and between (0,50-1,0) for the cost criterion. In other word, a weak preference is computed and not neglected which gives a more precise result. While, the linear preference function gives a full preference if the difference exceeds the preference threshold (0,50) for both the capability and experience criteria and 1 for the cost criterion. Furthermore, even the differences between the scale orders is one, selecting lesser thresholds, give a more precise result as it takes into consideration the minimum decimal fractions. Finally, it is worth noting that *visual Promethee* weights of the criteria are automatically normalized by the software.

6.6.4 Evaluation Result of Alternatives of The Information Needs Identification Task

The third round of the panel is allocated to assess the performance of each alternative with regard to each criterion. The consensus principle still exists in this case. The figure bellow shows all the information mentioned.

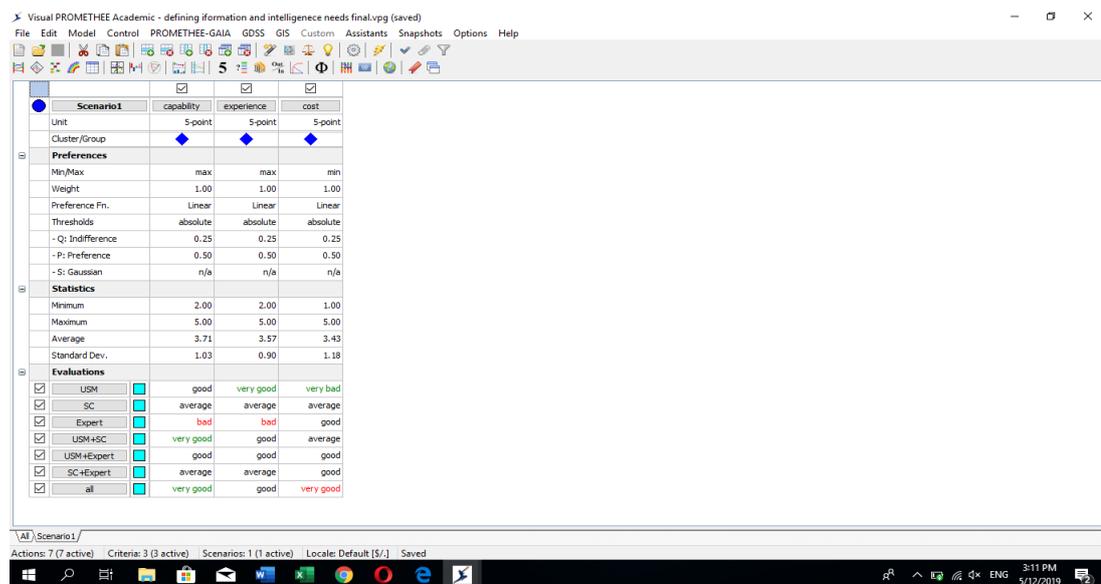


Figure 0.1. Visual Promethee, Data screen of the information identification task

Now, as we entered all the information required by the software, we proceeded to evaluate the different alternatives. The analyses could be presented in tables, or in different ways, such as: *Promethee ranking*, *Promethee Diamond*, *Promethee Network*, *Promethee Rainbow* and others. In the next sections we consider some of these tools that is enables comparing alternatives or (*actions* in the *Promethee* terminology) in different ways.

- **Promethee Flow Table**

In order to evaluate the performance of an alternative, *Promethee* introduces two important concepts. First, the outgoing, leaving or positive flow (Phi+). It indicates how much a designated alternative is preferred over the other alternatives, the larger the positive flow the better the action. Second, the incoming, entering or negative flow (Phi). This shows how much other alternatives are preferred over a designated alternative, the smaller the negative flow the better the action. Finally, the net flow (Phi) summarizes the preference for each alternative over the others, it can be positive or negative, the larger the net flow the better the action (Lolli et al., 2019; Visual Promethee, 2013: 149). In *Visual Promethee* the flows are computed automatically, the table below shows the positive, negative and net flows.

Table 0.3. *Flow table of the business intelligence process first task*

Rank	action	Phi	Phi+	Phi-
1	USM	0,7222	0,8333	0,1111
2	USM+SC	0,5556	0,6667	0,1111
3	all	0,0556	0,4444	0,3889
4	USM+ Expert	0,0556	0,3889	0,3333
5	SC	-0,1667	0,3333	0,5000
6	SC+ Expert	-0,4444	0,1667	0,6111
7	Expert	-0,7778	0,0556	0,8333

Table 6.3 displays the values of the flows of all alternatives., They are ranked from the best to the worst according to the net flow (Phi) values. It is clear that USM has the highest net flow value (Phi) equal to 0,7222. The USM in collaboration with the Palestine Stone and Marble Centre at Palestine Polytechnic University comes at second place with a net flow value (Phi) of 0,5556. The USM, Stone Centre and an expert together (*all*) occupies the third rank. While, the USM and expert have a net flow value (Phi) of 0,5556. The remaining three places are occupied by external bodies with negative net flows.

These values indicate that decision makers perceive that USM is most likely to carry out the task of *identifying the business information needs of member SMEs* better than others. Conversely, decision makers perceive that the external bodies; the Palestine Stone Centre, or, an expert, or both of them together are not able to identify the information needs of the stone SMEs. The researcher argues that USM board members, SMEs representatives and USM staff representing the majority of the decision makers perceive that USM as the representative organization is able to identify the information needs of member SMEs, as well as, the problems and challenges they face. However, external bodies, and an external expert in particular is far away from the stone field and thus, unable to identify the information needs of stone SMEs.

It is worth noting that the flow table is an appropriate way to present the flow results and the ranking of alternatives when there is a large number of alternatives and when it is difficult to present them in a graphical way (Get Started Visual Promethee, 2013: 18). The values of the positive flow (Phi+) and those of the negative flow (Phi-) could be presented in what is called *partial ranking* or *Promethee 1* as will be shown in the next section.

- **Promethee 1, Partial Ranking**

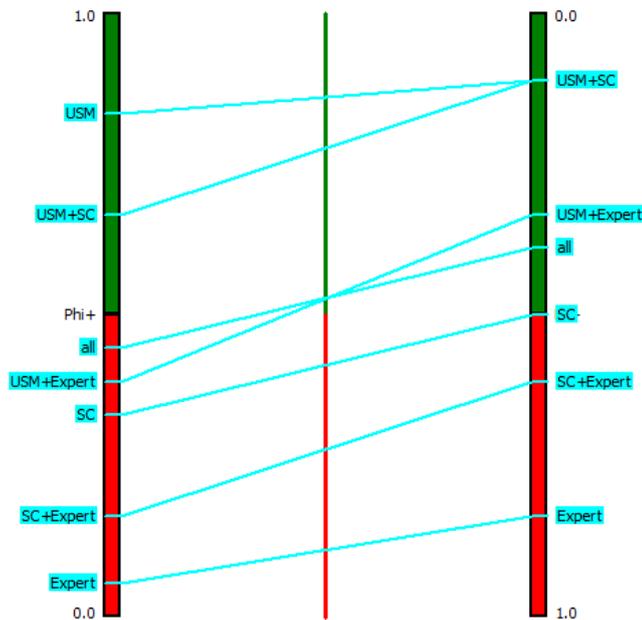


Figure 0.2. Promethee 1, partial ranking of alternatives of the business intelligence process first task

The leftmost column shows the ranking of the actions according to the positive flow (Phi+), the more an alternative is near the top position the better it is. USM has the better positive flow compared to other alternatives. On the contrary, the expert alternative is at the bottom of the column. This, indicates that experts' performance is apparently worse than the others. Conversely, the rightmost column shows the ranking according to negative flow (Phi-). The lower the value, the better the alternative is. For example, both the alternative USM and (USM and the Palestine Stone and Marble Centre) have the same lowest (Phi-) value, so, they are better than other alternatives. Meanwhile, both alternatives are incomparable regarding the negative flow value(Phi-). While the positive value of USM exceeds that of the (USM and Stone Centre) as mentioned above. This leads to the result that the USM is better than (USM and Stone Centre). To conclude, the USM outranks (USM and Stone Centre) according to the net flow value. This is clearly shown in the *Promethee 2* complete ranking as shown in the next section:

- **Promethee 2 Full Ranking**

In Promethee 2, complete ranking of the net flow values are presented in a graphical way to facilitate quick comparison between alternatives. The following figure, below, shows the net flow value of the 7 alternatives.

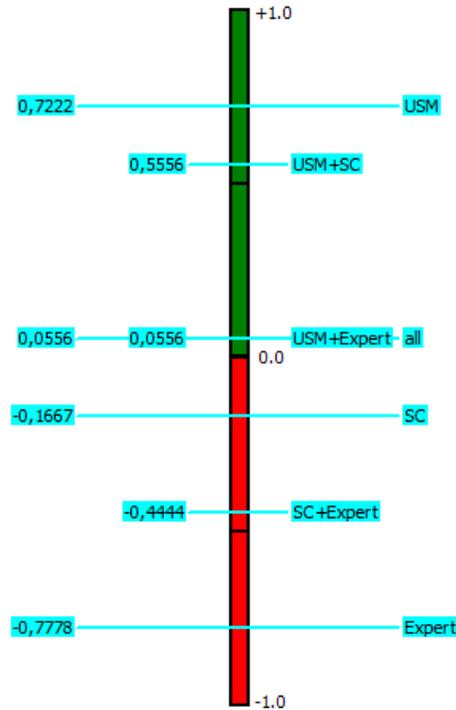


Figure 0.3. Promethee 2, complete ranking of alternatives of the business intelligence process first task

The complete ranking figure shows the full ranking of the alternatives based on their net flow value. For example, USM occupies the top of the figure, this indicates that USM completely outranks all other alternatives. USM and Stone Centre comes in the next position, while the outsourcing alternatives come at the bottom which indicates that they are outranked by other alternatives. Promethee 2 Full Ranking supports making comparison between alternatives to see which alternative ranks with others or *vice versa*. At the same time, *incomparability* between two alternatives can be discovered, if both alternatives have the same or very close net flow values. For example, both (USM and expert) alternative and *All* alternative are incomparable as

they have the same net flow value and they occupy the same position on the figure. *Visual Promethee* offers another way of displaying the complete ranking relations through *Promethee Network* as shown in next section that follows.

- **Promethee Network**

Promethee network presents the alternatives by nodes and arrows to indicate preferences. In this way, indifference is easily be detected. The figure below presents the *Promethee network* for the identification of the business information task of the BIP.

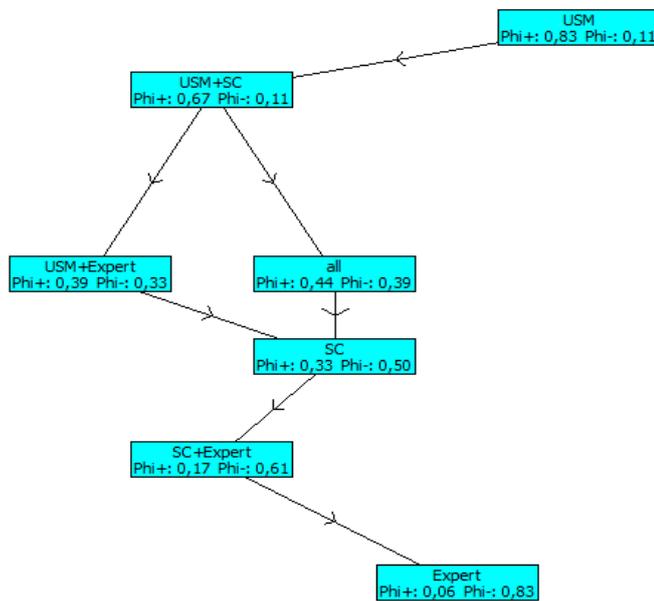


Figure 0.4. Promethee network of the business intelligence process first task

The arrows indicate the preference relations of the alternatives. For example, (USM and Stone Centre) ranks both *all* and (USM and Expert alternatives). Meanwhile, *all* and (USM and Expert alternatives) do not rank each other, as there are no arrows indicating this, therefore, they are incomparable. In other words, they are indifferent from the decision makers' perspective.

- **Promethee Rainbow**

In *Visual Promethee* software, *Promethee rainbow* is a disaggregated display of the *Promethee 2* complete ranking, actions are displayed from left to right. The best action

on the most left, while, the worst action occupies the most right position. The following figure illustrates the Promethee rainbow for the current case study.

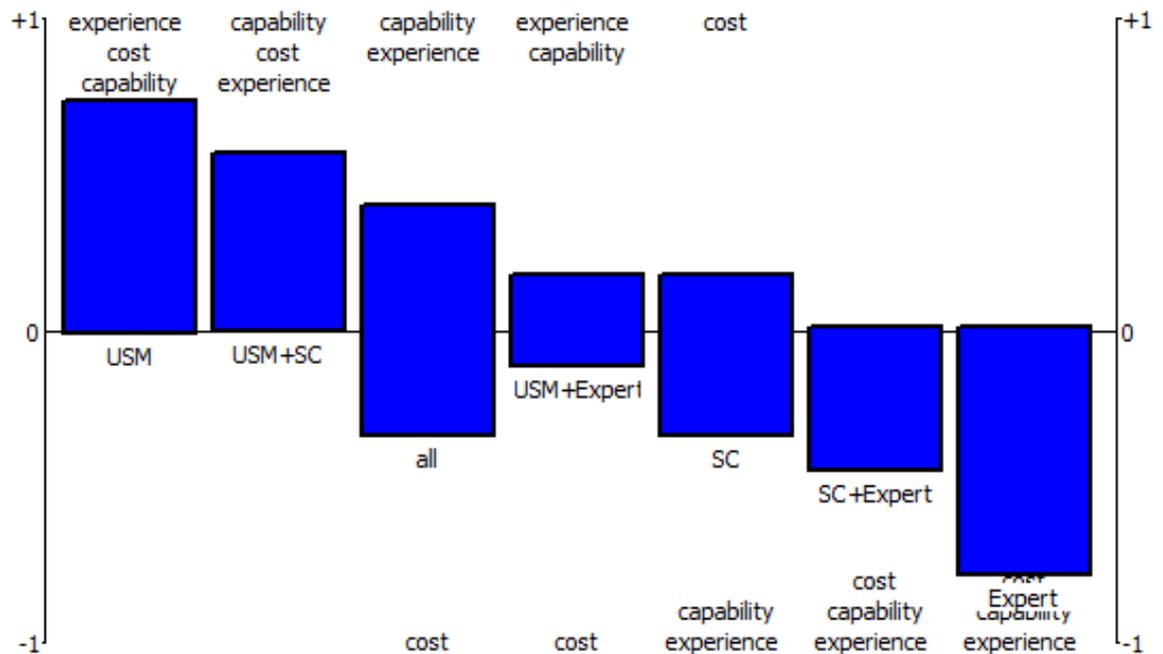


Figure 6.5. Promethee rainbow of the business intelligence process first task

As clearly shown from the figure, both the USM and Palestine Stone and Marble Centre exhibits no negative slices as all criteria contribute positively to the net flow. It can also be seen that these alternatives present no weaknesses with respect to other alternatives. The order of a criterion indicates its contribution to the net flow of the alternative. For example, *All* alternative (USM+ PSMC+ expert) has two positive criteria, the capability and experience. At the same time, it has a negative criterion, the cost. The two positive criteria more than compensate the negative one, therefore, the net flow is positive. To conclude this figure shows that USM is the best alternative as perceived by the 12 decision makers. It is likely to perform well against all criteria, then comes the (USM and Stone Centre) alternative. Conversely, the last three alternatives, Stone Centre, (Stone Centre and Expert) and expert exhibit negative performance against almost all criteria, or more precisely, present negative net flow indicate that they are perceived as

worst alternatives. Which mean they cannot carry out the identification of the information needs of stone SMEs.

The researcher interprets these results as a rational evaluation as the decision makers believe that USM is the most likely to identify the stone SMEs information needs., Meanwhile, the alternative (USM and Stone Centre) can also perform well this task., The engagement of the Stone Centre needs some financial resources, it comes at the second place. For the worst three alternatives, the researcher is in agreement with the evaluation that they lack the capability and experience of the stone industry, in addition they require more financial resources. In brief, these alternatives perform badly against almost all alternatives. So, these alternatives are excluded from consideration regarding the implementation of the task.

6.7. Task 2: The Evaluation Model for the Data Collection Task

Considering the information needs identified in the first task of the BIP. The second task of the BIP starts by identifying the sources of the data that will be collected. This includes primary and secondary sources as well. These sources include but are not limited to government websites, magazines, business reports, research papers, workshops, conferences, Business to Business Meetings, stone fairs and exhibitions. Based on the type and the source of the primary data, a proper data collection tool should be used, such as questionnaires, surveys, interviews, monitoring and others (Nasri, 2011: 64). This task consists of collecting identified data from different sources. Therefore, our problem that we are going to find a formal solution for it, is:

What is the best way to carry out the data collection task?

Can USM rely on its own capabilities to perform this task alone, does it need to completely outsource this task, or, should USM collaborate with external bodies?

To find a formal solution for this question, an evaluation model should be constructed, in order to identify, the different alternatives, the evaluation criteria, and the performance of each alternative with regard to each criterion. The following sections shed light on each of them in sequence.

6.7.1 The Set of Alternatives for Data Collection Task

The seven alternatives identified previously still exist for this task too, they are:

1. Do it yourself: To completely perform the task by USM staff only (*USM*)
2. Delegate the task to Palestine Stone and Marble Centre at Palestine Polytechnic University (*PSMC*)
3. Delegate the task to a consultancy firm (*Expert*)
4. The Union of Stone and Palestine Stone and Marble Centre at Polytechnic University (*USM* and *PSMC*)
5. The USM and a consultancy firm (*USM+ Expert*)
6. Delegate the task to both the Palestine Stone and Marble Centre at PPU and a consultancy firm (*PSMC+ Expert*)
7. Collaborate 3: The USM, the Palestine Stone and Marble Centre at the PPU and a consultancy firm (*ALL*)

The next section outlines the set of criteria that are used to evaluate the aforementioned alternatives.

6.7.2 The Set of Criteria for The Data Collection Task

In order to evaluate the alternatives of this task, the actors participating on the Delphi Panel have agreed to the following set of criteria: The ability to identify data sources and the ability to access to these sources. Professionalism in collecting data, and cost.

The following section present each of these criteria in details.

6.7.2.1 The Ability to Define and Access to Data Sources (Criterion 1)

This criterion measures the ability of defining data sources and the ability to have access these sources. This include access to secondary data sources, such as magazines, reports, websites, as well as the accessibility to primary data sources such as attending trade fairs, workshops and conducting surveys or interviews. This criterion to be maximized, an alternative with a higher ability to define and access to data source is likely to perform better than others. The actors agree on a qualitative scale, as it is difficult to measure this quantitatively. Therefore, a classical 5-point order scale: very bad, bad, average, good and very good is used. This scale was expressed by numbers from 1 to 5, where, 1 indicates very bad, while 5 very good.

6.7.2.2 The Capability to Collect Data (Criterion 2)

This criterion indicates the capability of an alternative to access and collect required data? This includes the number of staff and their skills in collecting data. This criterion to be maximized, an is alternative more capable staff is likely to be better than others. This criterion calls for qualitative scale, due to the difficulty of measuring it on a quantitative scale. Here we used the classical 5-point Likert scale: very bad, bad, average, good and very good. 1 stands for “very bad”, while 5 stands for “very good”.

6.7.2.3 Cost of Collecting Data (Criterion 3)

This measures the overall cost for carrying out this task. This criterion to be minimized, is an alternative with lower cost is likely to be better than others. Normally, This criterion calls for a quantitative scale. The decision makers estimated the cost of carrying out this task for each alternative. They took into account the cost of attending the stone international fairs, workshops and events in addition to the cost of subscription

in international magazines and business information centres. This decision maker agreed on the following thresholds for each criterion.

6.7.3 The Thresholds and Preference Functions of The Criteria for The Data Collection Task

The following section presents the indifference and preference thresholds as agreed upon from the panel members. Consequently, the researcher proposes the linear preference function for each criterion as, it gives more precise results as just argued before.

The following table, below, presents a set of criteria, their weights, the thresholds in addition to the scale of measurement each criterion.

Table 6.4 *The set of criteria for the business intelligence process's data collection task*

Criterion	Weight	Scale of measurement	Indifference threshold (q)	Preference threshold (p)
Accessibility to data sources	25%	Qualitative scale, Likert 5 orders	0,25	0,50
Capability	25%	Qualitative scale, Likert 5 orders	0,25	0,50
Cost	50%	Quantitative scale, in USD \$	\$ 2000	\$ 3000

6.7.4 Evaluation Result of Alternatives of The Data Collection Task

Panel members assessed the performance of each alternative with regard to each criterion, according to a consensus principle. The table below displays all the information needed to perform the evaluation.

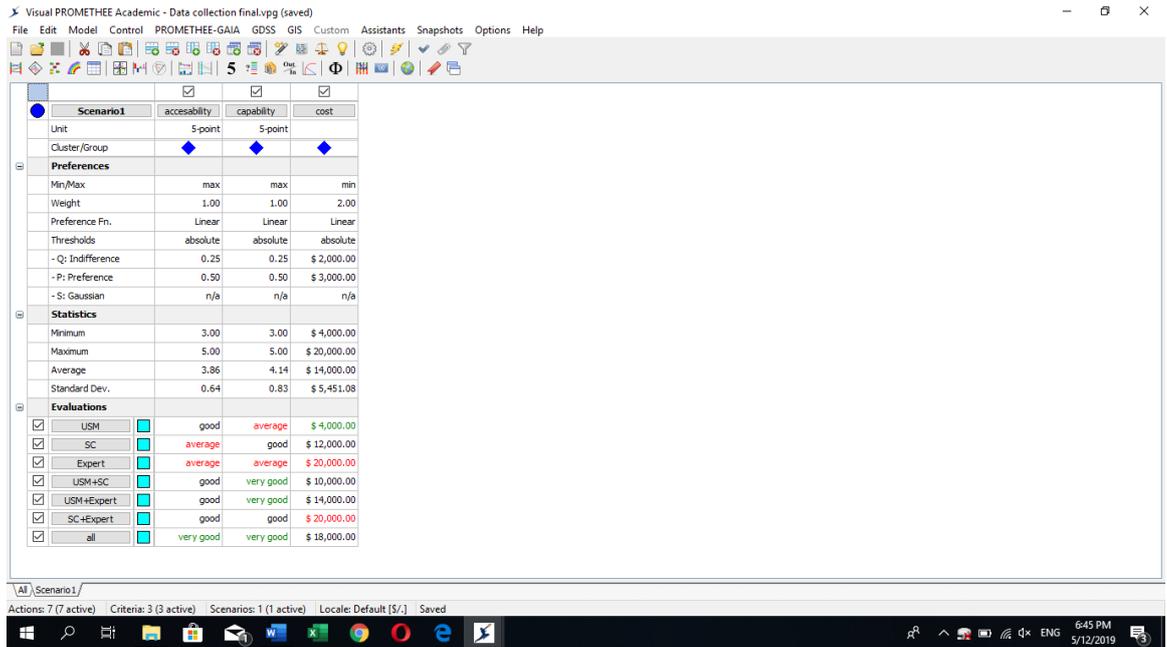


Figure 6.6. Visual Promethee, Data Screen of the Information Collection Task

Visual Promethee displays the result in tables, or in different ways, such as: *Promethee ranking*, *Promethee Diamond*, *Promethee Network*, *Promethee Rainbow* and others. In the next sections we examine some of these tools, as each display form compares the actions in different ways.

- **Promethee Flow Table:**

The *Promethee flow table* introduces both the positive flows (Phi+) as well as the negative flow (Phi-). To recapitulate, a positive (Phi+) indicates how much a designated alternative is preferred over other alternatives, the larger the positive flow the better the action. Conversely, a negative flow (Phi-) shows how much other alternatives are preferred over a designated alternative, the smaller the negative flow the better the action. In addition, the net flow (Phi) which is the difference between the positive and negative flow summarizes the preference for each alternative over the others, the larger the net flow the better the action (Lolli *et al.*, 2019; Visual Promethee, 2013: 149). The

Visual Promethee software computes automatically the flows of each alternative, the table below shows these values.

Table 6.5 *Flow table of the information collection task*

Rank	action	Phi	Phi+	Phi-
1	USM+SC	0,4583	0,5833	0,1250
2	USM	0,3333	0,5833	0,2500
3	USM+ Expert	0,2917	0,5000	0,2083
4	all	0,0833	0,4167	0,3333
5	SC	-0,0833	0,3333	0,4167
6	SC+ Expert	-0,3333	0,1667	0,5000
7	Expert	-0,7500	0,0000	0,7500

The above table ranks the alternatives according to their net flow values. It is clearly that (USM and Stone Centre at Palestine Polytechnic University) has the highest net flow value (Phi) equals to 0,4583. The USM comes in the second place with a net flow value (Phi) of 0,3333 with slight difference from the third ranked alternative, the (USM and expert) with net flow value of (Phi) equals to 0,2917. The USM, Stone Centre and an expert together (*all*) alternative occupies the fourth with a very small net flow value of 0,0833). The other three alternatives represent external bodies to USM occupy the last positions with negative net flows.

These values indicate that the decision makers panel perceive that (USM and Palestine Stone and Marble Centre at Palestine Polytechnic University) alternative are most likely to identify data sources and can collect them better than others. The researcher interprets this as the decision makers believing that USM has an advantage over other alternative as it have easy accesses to important sources of data, such as: stone events, conferences, workshops and stone fairs. Meanwhile, USM has weaknesses in access to local and international periodicals, magazines and research centres. These sources are easily accessible by the staff of the Stone Centre at the Palestine Polytechnic University. On

the other hand, the staff of the Stone and Marble Centre at the university are more proficient in collecting data as they have the tools to conduct scientific research. Therefore, the researcher concludes that the decision makers are right in their evaluation that USM and the Palestine Stone and Marble Centre (PSMC) complement each other in accessing to data sources and in collecting the required data. Meanwhile, decision makers perceive that external bodies: the Palestine Stone and Marble Centre, or an expert, or both of them together cannot carry out this mission without the existence of USM, because they have weaknesses in attending and participating in the stone industry events which is considered very important sources of data.

The values in the flow table could be displayed in two schematic ways. First, the partial ranking or *Promethee 1*. Here the values of the positive flow (Phi+) and those of the negative flow (Phi-) are presented separately. While, the net flow values are presented in *Promethee 2* complete ranking, both of them are presented in the next sections.

- ***Promethee 1* Partial Ranking**

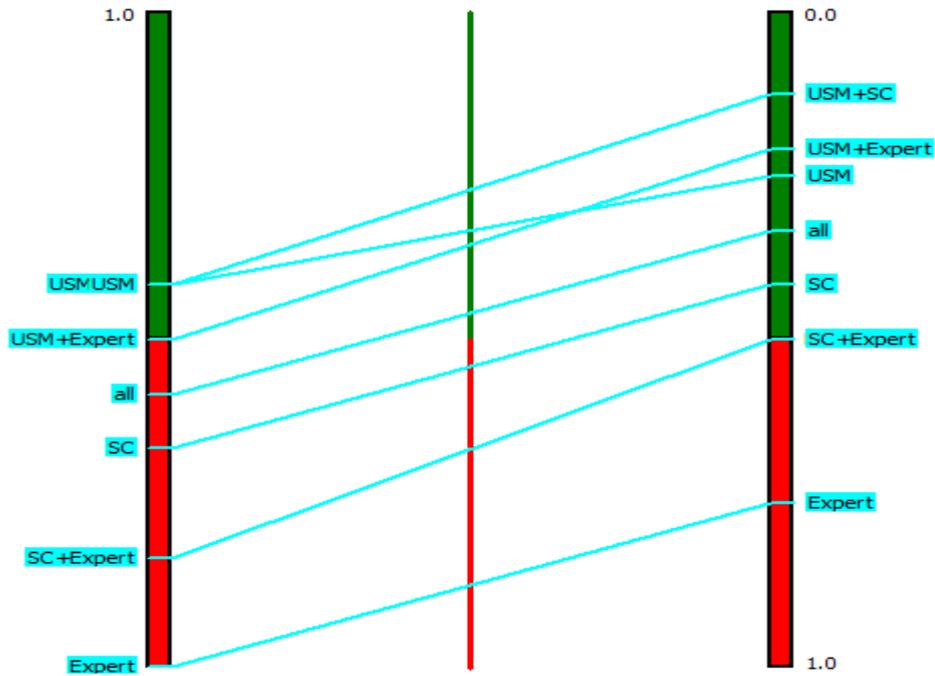


Figure 6.7. The Promethee 1, partial ranking of alternatives of the information collection task

The figure shows that (USM and Palestine Stone and Marble Centre) alternative has the better positive flow value accompanying with the USM compared to other alternatives. While, (USM and Palestine Stone and Marble Centre) has lesser negative flow which gives it an advantage over USM considering the net flow value. Another comparison between (USM and Expert) and USM leads to the result that they are almost indifferent or incomparable. The (USM and Expert) exceeds USM in the positive flow, while it is lesser than it in the negative flow, which means that this different variation would be seen to compensate each other.

- **Promethee 2 Full Ranking**

In *Promethee 2* complete ranking the net flow values are displayed in a graphical way to easily compare alternatives. The figure, below, shows the net flow (Phi) value for the our case study.

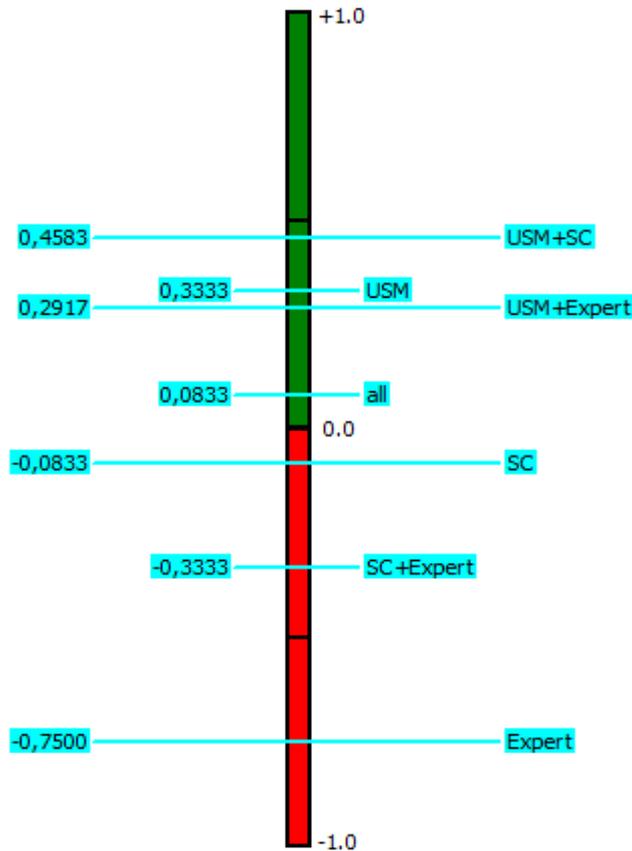


Figure 6.8. *Promethee 2*, complete ranking of alternatives of the information collection task

Promethee 2 complete ranking supports makes comparison between two alternatives to establish the preference or incomparability relation. The alternatives are ranked from the top (best alternative) to the bottom (worst) one according to their net flow values. If both alternatives have the same values or very close net flow values, they are said to be incomparable. For example, even though USM is above the (USM and expert) alternative, this difference is very small and does not lead to a preference relation. Therefore, they are said to be indifferent or incomparable. *Visual Promethee* offers another way of displaying the complete ranking relations through *Promethee Network* as shown in next section.

- **Promethee Network**

Promethee network indicates alternatives by nodes and arrows to indicate preferences, so that indifference can be easily detected. The figure below presents the *Promethee network* for our case study.

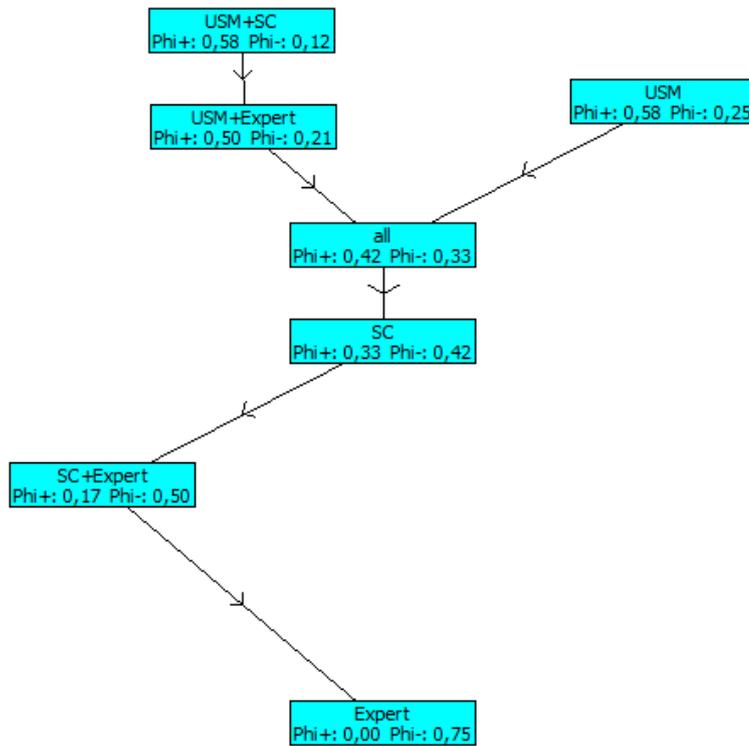


Figure 6.9. Promethee network of the information collection task

The arrows indicate the preference relations between alternatives. The alternatives are ranked from the top, the best alternative (USM and Palestine Stone and Marble Centre) to the bottom one, the worst alternative (the expert). This is clearly shown by the arrows. Meanwhile, none of the alternatives, USM and (USM and Expert) ranks each other as no arrow indicates a preference relation of one over another. Therefore, they are incomparable accordingly.

- **Promethee Rainbow**

Promethee rainbow is a disaggregated presentation of the *Promethee 2* complete ranking, actions are presented from left to right, best action on the most left, while, the

worst action occupies the most left position. In addition, the upper criterion has a positive contribution to the net flow, while, the bottom criterion presents negative contribution to the net flow. The following figure illustrates the *Promethee rainbow* for the present case study.

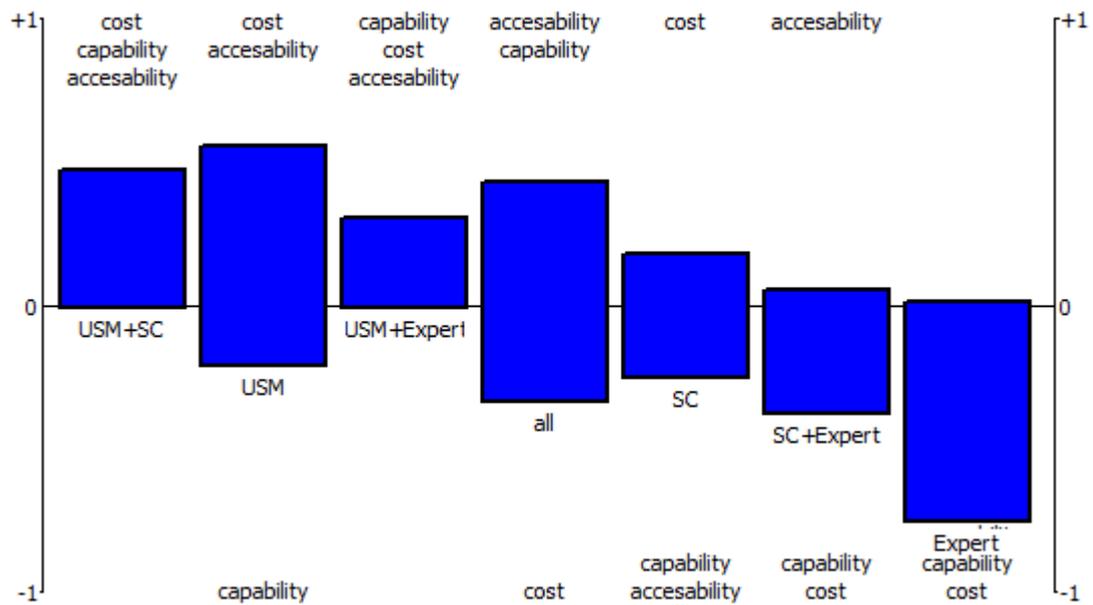


Figure 6.10. *Promethee rainbow* of the information collection task

The figure 6.10. displays that all three criteria contribute positively for the net flow of the (USM and Stone Centre) alternatives. While, in the Case of the USM alone, two criteria, the cost and accessibility contribute positively. On the other hand, the capability criterion has a negative impact. Finally, for the outsourcing alternatives, it is likely that they are ranked by all other alternatives where the USM exists, this could be argued that the panel members perceive that the USM is more able to collect the needed data with collaboration with the Stone Centre at the university. From the one hand, the USM has accessibility to stone events, fairs, workshops and stone industry related magazines. On the other hand, the staff of the stone Centre at the university could access to international journals and academic publication and reports. Therefore, both complements each other's.

6.8 Task 3: Building an Evaluation Model for The Data Analyses Task

Data analysis considering the most difficult task of the business intelligence process (BIP). Data analyses is the task that add value to the firm through the enhancement of decision-making management Nasri (2011). In this task a variety of analysis tools such as: SWOT, PEST, scenario analyses, competitive analyses, and others are applied to transform some diverse pieces of information into an actionable plan (Nasri, 2012). Therefore, performing this task mainly requires the capability to use the analyses tools to generate intelligence reports that meet the intelligence needs of the stone SMEs.

Based on that, the problem that is needed to be solved is.

What is the best way to of carry out the data analyses task?

Can the USM, depending on its own capabilities and resources perform this task alone, does it need to completely outsource this task, or, should the USM collaborate with external bodies?

To start the evaluation process, the set of the alternatives, set of evaluation criteria, the importance weight of each criterion and the preference threshold for each criterion, if exist have to be identified. Then, the Promethee methodology is applied to evaluate the alternatives and to get the solution for the problem. The following sections shed lights on these topics.

6.8.1 The Set of Alternatives for The Data Analyses Task

The seven potential actions identified previously exist for this task too, they are:

1. Do it yourself: To completely perform the task by USM staff only (*USM*)
2. Delegate the task to Palestine and Marble Stone Centre at Palestine Polytechnic University (*PSMC*)
3. Delegate the task to a consultancy firm (*Expert*)

4. Union of Stone and Stone Centre at Polytechnic University (*USM* and *PSMC*)
5. USM and a consultancy firm (*USM+ Expert*)
6. Delegate the task to both PPU and a consultancy firm (*SC+ Expert*)
7. Collaborate 3: USM, PPU and a consultancy firm (*ALL*)

To proceed for the evaluation of these alternatives, we need to bring the evaluation criteria that was selected from the panel member at the Delphi Method. These criteria are:

6.8.2 The Set of Criteria for The Data Analyses Task

The evaluation set of criteria for this task, as identified by the decision makers (see table above) are: Human factor, the Information Technology infrastructure, and cost of performing the data analysis task.

6.8.2.1 The Human factor (Criterion 1)

This criterion evaluates the education, training, analyses capability and experience of the staff who perform the data analyses task. This criterion is to be maximized and it calls for a qualitative scale, due to the difficulty of measuring it quantitatively. A 5-point order scale: Very bad, bad, average, good and very good. This scale is expressed by numbers from one to five, one points to very bad, while five points to very good.

6.8.2.2 The Information Technology Infrastructure (Criterion 2)

This criterion evaluates the IT infrastructure that includes Hardware and Software and analytical programs. This criterion was to be maximized. A classical 5-point order scale: very bad, bad, average, good and very good is used. This scale expressed by numbers from 1 to 5.

6.8.2.3 The Cost of Analyzing Data (Criterion 3)

This criterion evaluates the overall cost occurred for performing data analyses task. The criterion was to be minimized. This criterion should be expressed in a quantitative scale, but, due to the difficulty of measuring it quantitatively, a similar qualitative classical 5-point order scale: very bad, bad, average, good and very good was used, expressed by numbers.

6.8.3 The Thresholds and Preference Functions of the Criteria for The Data Analyses Task

The table below, displays the indifference and preference thresholds. Decision makers associate an indifference threshold of 0.25 for both human factor and IT infrastructure factors. While, they agree on 0.5 for the cost criterion. On the other hand, the panel members agreed on preference thresholds as: 0.5 for both the human and IT infrastructure factors and 1 for the cost factor. A linear preference function is selected to give more precise result.

Table 0.6 *The set of criteria for the data analyses task*

Criterion	Weight	Scale of measurement	Indifference threshold (q)	Preference threshold (p)
Human Factors	25%	Qualitative scale, Likert 5 orders	0,50	0,50
IT infrastructure	25%	Qualitative scale, Likert 5 orders	0,25	0,50
Cost	50%	Qualitative scale, Likert 5 orders	0,25	1

6.8.4 Evaluation Results of the Alternatives of The Data Analyses Task

The figure below displays the collected data from the panel members. These data include the minimum and maximum values of each alternative against each criterion, in addition to the performance values of each criterion.

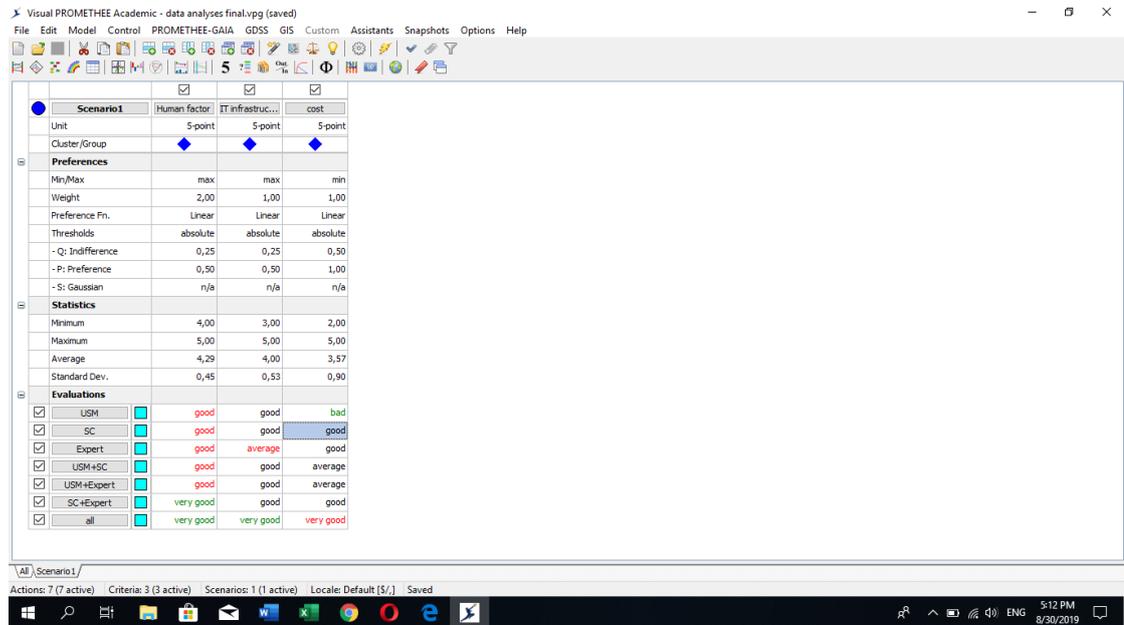


Figure 6.11. Visual Promethee, Data screen of the data analyses task

The Visual Promethee software enables the presentation of these data in different ways, such as: *Promethee flow table*, *Promethee Network*, and *Promethee Rainbow*. these tools are presented in the following subsections.

- **Promethee Flow Table**

Promethee Flow table displays the positive flows (Phi+), negative flows (Phi-) and the net flow (Phi). The table below displays their values for the data analyses task of the BIP.

Table 6.7 *Flow Table of the Data Analyses Task*

Rank	action	Phi	Phi+	Phi-
1	all	0,4167	0,6667	0,2500
2	PSC+ Expert	0,3333	0,5000	0,1667
3	USM	0,0833	0,2917	0,2083
4	USM+ PSC	-0,0417	0,2083	0,2500
4	USM+ Expert	-0,0417	0,2083	0,2500
6	SC	-0,2500	0,0833	0,3333
7	Expert	-0,5000	0,0417	0,5417

Table 6.7 displays the values of the flows of all alternatives in ranked from the best to the worst. It is clear that *All* alternative has the highest net flow value (Phi) equal to 0.4167. This illustrates that (USM, PSMC and an external consultant) is likely the better alternative to carry out the data analyses task. This could be argued that all of these entities complement each other in performing this task. On the contrary, the Stone and Marble Centre and the expert options occupy the bottom of the alternatives. This illustrates that the panel members perceive that the any entities far from the existence of the USM cannot carry out this mission. *Visual Promethee* offers another way of displaying the complete ranking relations through *Promethee Network* as shown in next section that follows.

- **Promethee Network**

Promethee network presents the alternatives by nodes and arrows to indicate preferences. At the same time, indifference easily can be detected. The figure below presents the *Promethee network* for the data analyses task of the BIP.

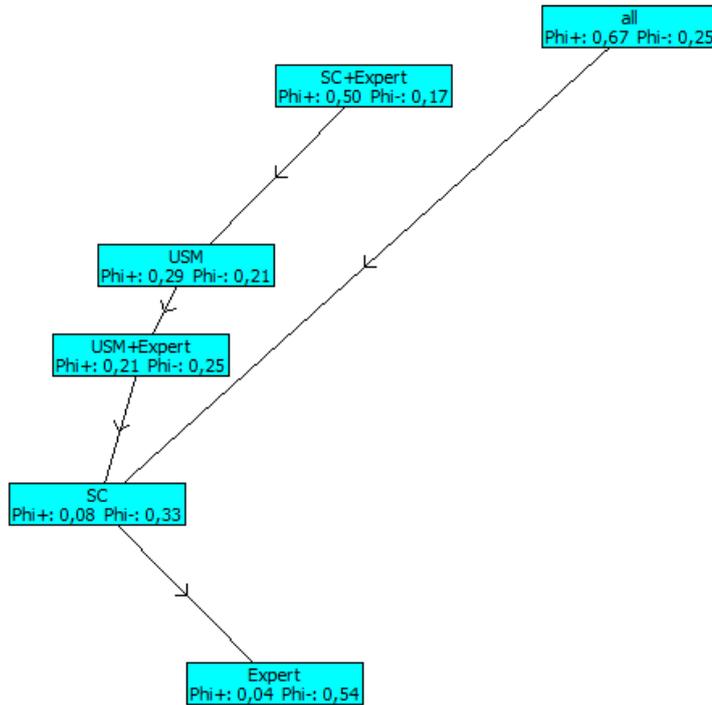


Figure 6.12. Promethee network of the data analyses task of business intelligence process. The arrows indicate the preference relations of the alternatives. For example, all alternative could be incomparable with the (Palestine Stone and Marble Centre and an expert). The researcher stands with the opinion that the *all* alternative is the optimal solution. Because, neither the PSMC, nor an expert might carry this mission with the absence of the USM. Because the USM has its own interpretation to the analyses output, Since, the USM is more aware of members information and intelligence needs. Let us see the effect of each criterion in the ranking of the alternatives. This is applicable through Promethee Rainbow.

- **Promethee Rainbow**

Promethee rainbow is a disaggregated display of the *Promethee 2* complete ranking, actions are displayed from left to right. The best action on the most left, while, the worst action occupies the most right position. Promethee Rainbow allows displaying the ranking of alternatives with the effect of each criteria. The following figure illustrates the Promethee rainbow for the data analyses task.

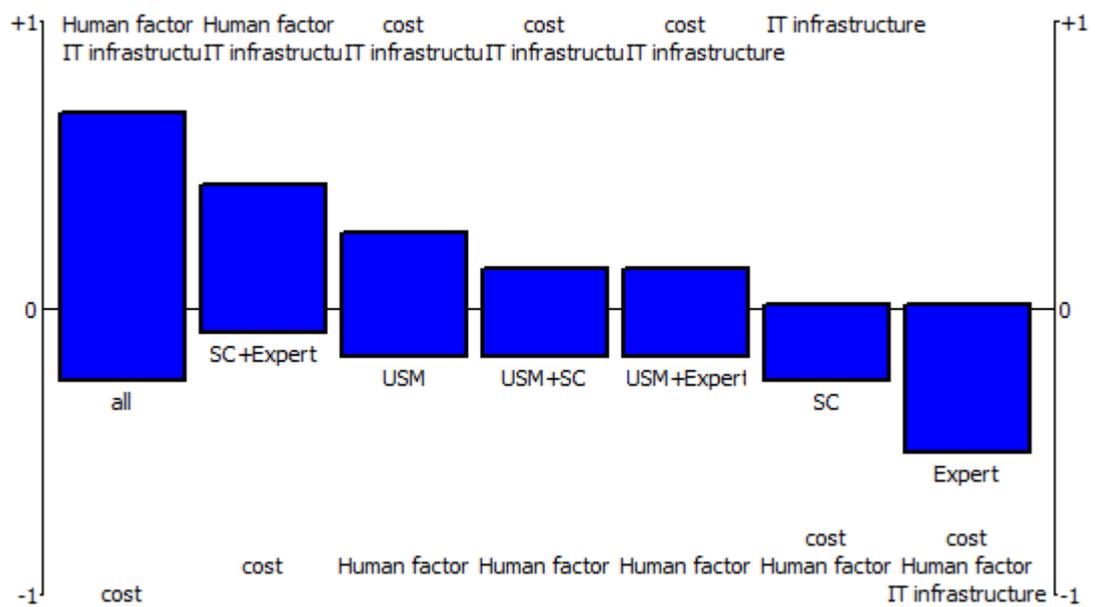


Figure 6.13. Promethee rainbow of the data analyses task of business intelligence process

As clearly shown from the figure, the **All** alternative exhibits positive slights on human and IT infrastructure factors. The researcher explains that as the capabilities and the resources of the three entities (The USM, the PSMC and the expert) complement each other's. On the contrary, the **All** alternative exhibits a negative slice for the cost criterion, it is argued that the engagement of the PSMC and an expert in this task requires additional cost. For the expert option that occupies the bottom of the rank, all of the three criteria show negative slices. In other words, this alternative has three negative criteria that ranks it at the bottom, no criterion elaborates positively to this action. To conclude, this figure shows that the **All** action is the best alternative as perceived by panel members. Then, (Stone Centre and Expert) comes at the second place. Conversely, the last two alternatives are: Stone Centre with two negative slices, the cost and human factors, followed by the Expert option, with 3 negative slices. Therefore, the researcher stands with this result that on the data analyses task **All** (USM,

PSMC and expert) together should take a role as this task the most crucial task of the BIP (Nasri, 2011).

6.9 Task 4: Building an Evaluation Model for Communication and Feed Back Task

According to the online business dictionary, communication is a core activity of an organization, that can not operate without it, it is two- way process of reaching mutual understanding and share meaning¹. In addition, the researcher stands with the Bougnoux (2001) that communication is a relation that enables exchanging information to make sense.

In the Business Intelligence Process (BIP) the value-added information and intelligence generated during the data analyses task is communicated with stone and marble SMEs to meet their information needs. Communication is important to assess the intelligence effectiveness and to get feedback in order to improve the process (Nasri, 2011). Information and intelligence reports are communicated through different ways, such as newsletter, emails, reports and others.

In the following sections we evaluate the best form for the USM to carry out this task. therefore, the problem that we seek to solve it could be presented as:

What is the best way to of carry out the intelligence communication task?

Can USM by depending on its own capabilities and resources perform this task alone, does it need to outsource this task, or, should USM collaborate with external bodies?

To apply the Promethee methodology, we need to identify the alternatives, criteria, criteria weights and thresholds, preference function and then to see the performance values of each alternative as the panel members get consensus on.

¹ <http://www.businessdictionary.com/definition/communication.html>

6.9.1 The Set of Alternatives for Communication and Feed Back Task

The same set of actions or alternatives are existing for this task too, they are:

1. Do it yourself: To completely perform the task by USM staff only (*USM*)
2. Delegate the task to Stone Centre at Palestine Polytechnic University (*PSMC*)
3. Delegate the task to a consultancy firm (*Expert*)
4. Union of Stone and Stone Centre at Polytechnic University (*USM* and *PSMC*)
5. USM and a consultancy firm (*USM+ Expert*)
6. Delegate the task to both PPU and a consultancy firm (*PSMC+ Expert*)
7. Collaborate 3: USM, PPU and a consultancy firm (*ALL*)

The next section presents the criteria needed for the evaluation of these alternatives.

6.9.2 The Set of Criteria for Communication and Feed Back Task

The evaluation set of criteria for this task, as identified by the decision makers (see table above) are: Branding, communication effectiveness and the cost of performing the communication of BIP task.

6.9.2.1 The Brand Image (Criterion 1)

Brand image could be considered as the set of perceptions about and organization, company or product. It represents what people feel, say or think about. In short, it is the reputation, identity, and image in the eyes of the stakeholder (Paco *et al.*, 2015: 98-99).

Similarly, Kylander & Stone (2012) state that:

“A brand is more than a visual identity: the name, logo, and graphic design used by an organization. A brand is a psychological construct held in the minds of all those aware of the branded product, person, organization, or movement”¹.

Brand image is an important matter for both the profit and non-profit organization. Some researchers even claim that it is much more important in the case of non-governmental organization (Kylander& Stone, 2012; Paco *et al.*, 2015). Branding has a strategic role in the core performance of the organization and it is a matter for the entire executive team, it strengthens the internal identity, cohesion and capacity (Kylander& Stone, 2012; Paco *et al.*, 2015). They add that brand plays different roles with different stakeholders, internally it shapes the identity of the organization and represent its mission and value, whereas, it reflects the image of the organization in the mind of its different stakeholders for the external role. They conclude that a strong brand is more powerful when internal identity and external image align with each other and with organizations’ values and mission; therefore, it is the responsibility of the executives, board of director, and staff.

From the above-mentioned explanation, and based on his own experience in public, private and nongovernmental sectors, the researcher agrees with these opinions that brand image is an essential tool for The Business Membership Organization (BMOs) dealing with all stakeholders internally and externally. It focuses the attention on all internal actors to work together to promote their organization and to situate a powerful image in the mind and eyes of its external stakeholders.

For the external stakeholders, brand image is primarily the most important for SME members who should feel that they belong to a powerful organization and that the organization is able to defend their interest and fulfil their needs. In essence, a good

¹ https://ssir.org/articles/entry/the_role_of_brand_in_the_nonprofit_sector

image of USM amongst its members could attract others to join the organization. Many cases of new members pointed out that story telling of old members about the services of USM were the main reasons convinced them to become members. While, for internal actors point out that differentiating USM might be firstly originated in the delivery of non-traditional services such as business intelligence to SMEs members. They claim that when the organization grows in the eyes of its members, it grows in the eyes of others as well.

This criterion is to be maximized and it calls for a qualitative scale, due to the difficulty of measuring it quantitatively. A 5-point order scale: very bad, bad, average, good and very good. This scale is expressed by numbers from one to five, one points to very bad, while five points to very good.

6.9.2.2 The Communication Effectiveness (Criterion 2)

This criterion is related to the effectiveness of communication task to communicate with member SMEs. Effectiveness points to

“The degree to which objectives are achieved and the extent to which targeted problems are solved. In contrast to efficiency, effectiveness is determined without reference to costs and, whereas efficiency means "doing the thing right," effectiveness means "doing the right thing.”¹

In short, this criterion points to the optimal way of communicating with members. Which alternative has the tools to carry out this mission effectively, regardless of the cost? this criterion was to be maximized. A classical 5-point order scale: very bad, bad, average, good and very good is used. The scale is expressed by numbers, from one to five.

¹ <http://www.businessdictionary.com/definition/effectiveness.html>

6.9.2.3 The Cost of Communicating Information and Intelligence (Criterion 3)

This criterion evaluates the overall cost for the task of communicating intelligence with member stone SMEs. data analyses task. This criterion was to be minimized. This criterion should be expressed in a quantitative scale, but, due to the difficulty of measuring it quantitatively, a similar qualitative classical 5-point order scale: very bad, bad, average, good and very good was used.

6.9.3 The Thresholds and Preference Functions of The Criteria of The Communication Task

The table below, displays the indifference and preference thresholds. Decision makers associate an indifference threshold of 0.25 for both human factor and IT infrastructure factors. While, they agree on 0.5 for the cost criterion. On the other hand, the panel members agreed on preference thresholds as: 0.5 for both the human and IT infrastructure factors and 1 for the cost factor. A linear preference function is selected for the reason mentioned above.

Table 6.8 *The set of criteria for the communication task.*

Criterion	Weight	Scale of measurement	Indifference threshold (q)	Preference threshold (q)
Branding	40%	Qualitative scale, Likert 5 orders	0,25	1
Effectiveness	20%	Qualitative scale, Likert 5 orders	0,25	0,50
Cost	40%	Qualitative scale, Likert 5 orders	0,50	1

6.9.4 Evaluation Results of the Alternatives of the Communication and Feedback Task

The panel members agree on the following data regarding the communication and feedback task of the BIP. The figure below presents the data needed to evaluate this task.

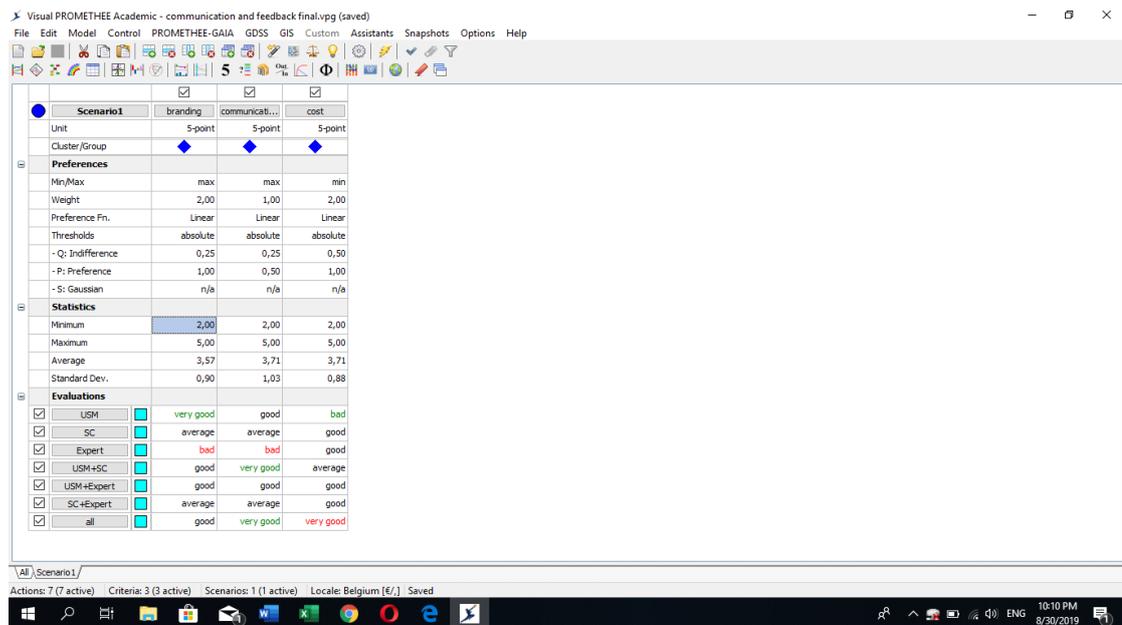


Figure 6.14. Visual Promethee, Data Screen of the Communication Task

The researcher illustrates these data on different shapes: *Promethee flow table*, *Promethee Network*, and *Promethee Rainbow*. The researcher analyses these data in the following sections.

- **Promethee Flow Table**

The table below displays the positive flows (Phi+), negative flows (Phi-) and the net flow (Phi) values for each alternative and their ranking.

Table 6.9 *The set of criteria for the communication task.*

Rank	action	action	Phi	Phi+	Phi-
1	USM		0,8333	0,9000	0,0667
2	USM+SC		0,5667	0,7000	0,1333
3	USM+ Expert		0,1000	0,3667	0,2667
4	all		-0,1000	0,3667	0,4667
5	SC		-0,3667	0,1667	0,5333
5	SC+ Expert		-0,3667	0,1667	0,5333
7	Expert		-0,6667	0,0667	0,7333

The alternatives are ranked from the best to the worst according to the net flow (Phi) values. The USM has the highest net flow value (Phi) equal to 0,8333. The USM in collaboration with the Palestine Stone and Marble Centre at Palestine Polytechnic University comes at second place with a net flow value (Phi) of 0,5667. The (USM and an expert) together occupies the third rank, with a net flow value (Phi) of 0,1000. On the opposite, the rest alternatives have minus net flow.

These values indicate that decision makers perceive that USM is most likely the best alternative to perform the information and intelligence communication task. The researcher supports this point of view that USM as a representative body can better carry out this task. The USM and PSMC together comes in at the second place. The researcher argues that both institutions together can carry out this mission, panel members perceive that both institutions are non-profit organizations and can communicate with members with different information and intelligence reports. On the other hand, the result indicates that panel members see that USM should be there in carrying out this mission, as other alternatives might not perform well regarding the branding, effectiveness and cost criteria. In the following section the flow table is presented in a Promethee 2 full ranking graph.

- **Promethee 2 Full Ranking**

In Promethee 2, complete ranking of the net flow values are presented in a graphical way to facilitate quick comparison between alternatives. The following figure, below, shows the net flow value of the 7 alternatives.

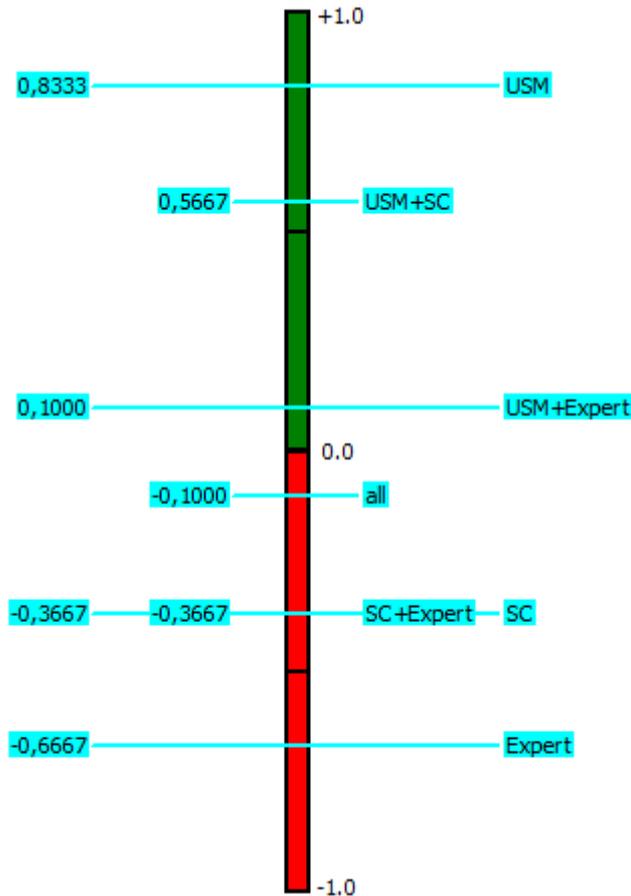


Figure 6.15. Promethee 2, complete ranking of alternatives of the communication task

Visual Promethee offers another way of displaying the complete ranking relations through *Promethee Network* as shown in next section that follows.

- **Promethee Network**

Promethee network presents the alternatives by nodes and arrows to indicate preferences. In this way, indifference easily can be detected. The figure below presents the *Promethee network* for the identification of the business information task of the BIP.

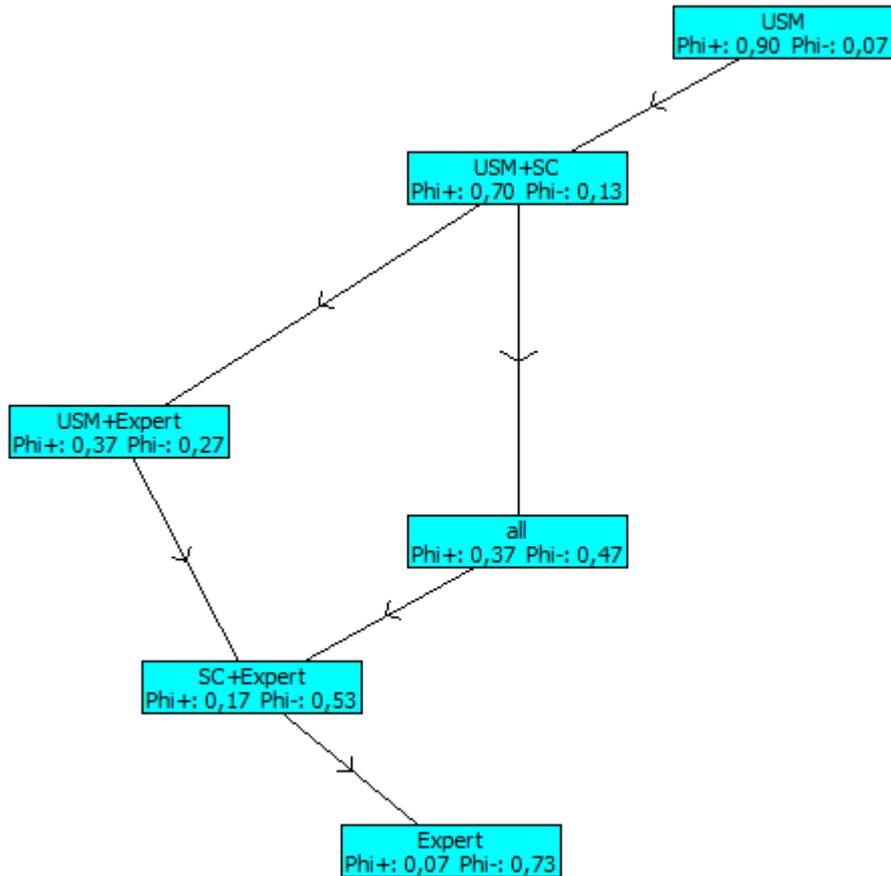


Figure 6.16. Promethee network of the data analyses task of business intelligence process

The arrows indicate the preference relations of the alternatives. The full ranking is clear. For example, the USM is at the top followed by the (USM and Stone Centre). While, the expert occupies the bottom of the figure. This means that the participants believe that USM is more capable to carry out this mission. On the contrary, the expert alternative or even the expert and the PSMC together are not capable to carry out this task. The researcher argues that the USM has direct links with members and therefore, it is more capable to define the most professional way of communicating business information to members. Furthermore, the researcher ascertains that communicating sensitive business information and intelligence reports should be kept at the hand of the USM.

- **Promethee Rainbow**

In *Promethee rainbow*, actions are displayed from left to right. The best action on the most left, while, the worst action occupies the position to the most right. The following figure illustrates the Promethee rainbow for the current case study.

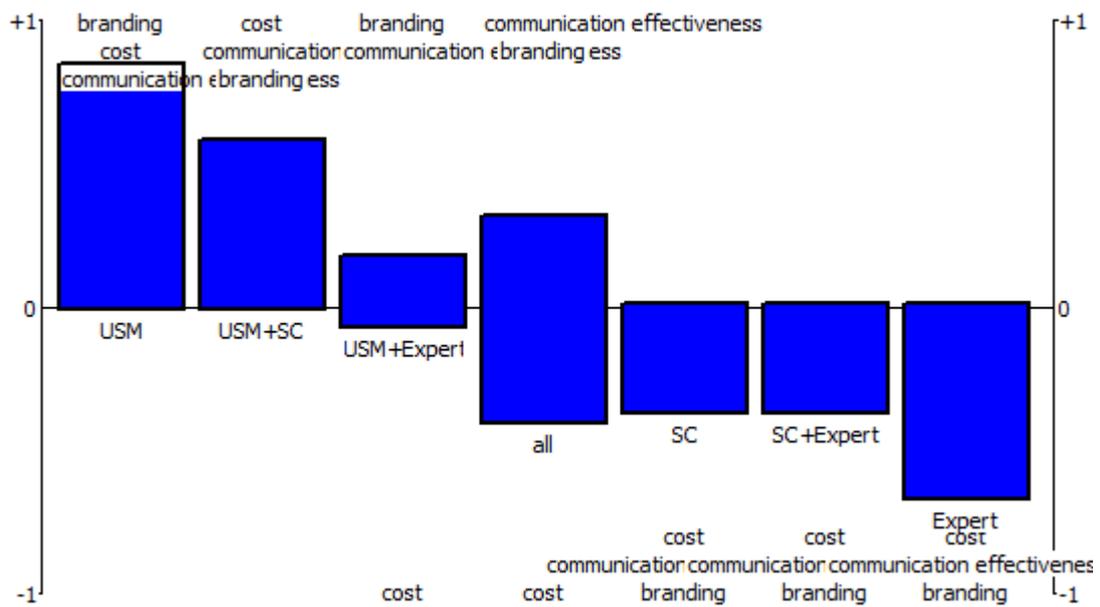


Figure 6.17. *Promethee rainbow* of the data analyses task of business intelligence process

As clearly shown from the figure, the USM performs well against all criteria. Branding, cost and communication respectively contribute to this position. The (USM and Stone Centre) exhibits no negative slices too. For the (USM and Expert), branding and communication contribute positively, while, cost presents a weakness. The last three alternatives, the PSMC, PSMC and Expert and expert respectively shows no positive criteria. To conclude this figure shows that USM is the best alternative as perceived by the decision makers. It is likely to perform well against all criteria, then comes the (USM and Stone Centre) alternative. Conversely, the last three alternatives, Stone Centre,

(Stone Centre and Expert) and expert exhibit negative performance against all criteria, or more precisely, present negative net flow indicate that they are perceived as the worst alternatives. Which mean they cannot carry out the identification of the information needs of stone SMEs.

The researcher interprets these results as the decision makers believe that the USM is the most likely to communicate the information needs with member SMEs. Meanwhile, the alternative (USM and Stone Centre) can also perform well this task. For the worst three alternatives perform badly against almost all criteria. So, these alternatives are completely excluded from consideration regarding the implementation of the communication task. The next chapter displays the main findings of the research, it also proposes the final recommendations.

CHAPTER 7

SUMMARY OF FINDINGS AND RECOMMENDATIONS

This chapter, first presents the main findings of the research. Some of these findings are based on the survey of the relevant literature, while other are based on the analyses of the data collected during the Delphi rounds. The chapter concludes with a set of final recommendations.

7.1 Summary of Findings

The major findings of this research are summarized below:

1. The information need of the stone and marble SMEs in Palestine included among others, marketing information, financial information, technical information and know how, quality related information, logistics clearance and training
2. The information services of the Palestinian governmental agencies and Palestinian Business Membership Organizations were not adequately acknowledged by the owners/managers of the Palestinian stone and marble SMEs.
3. Access to business information through the informal sources such as access to internet, attending fairs and exhibitions, network and personal relations show some significant level compared to official government and organizational sources as information providers. This result signifies that stone and marble SMEs perceive that official sources underperform one of their crucial services, which is the provision of information services to SMEs
4. The Union of the Stone and marble Industry in Palestine shows similar deficiencies in its information services provision.
5. The Business Intelligence system is highly recommended in the case of the service or non-profit organization as well as in the case of the for-profit organization.

6. For the BI implementation several CSFs are exist: the most important are: team skills, availability of resources, staff experience, top management commitment and accessibility to information sources.
7. Based on the researcher experience, the SWOT analyses, and the empirical result of a study about the information services provision of the USM. It could be said that the USM is not able to run a BI system based on its own capabilities and resources. Therefore, the organization has to cooperate with other organization, at least in the short run, to overcome these deficiencies.
8. The priority for cooperation is with the Palestine Stone and Marble Centre at the Palestine Polytechnic University. As the USM considers a main partner of the centre, in addition, the centre's mandate is tailored to fulfil the needs of the stone and marble SMEs.
9. To run the task of "identification of business information needs" of the Business Intelligence Process. It is observed that decision makers perceive that the optimal solution is to perform this task by the USM. The alternative is to perform this task jointly by both the USM and Palestine Stone Centre.
10. The optimal solution for running the "data collection task" is to perform it jointly by "the USM and the Palestine Stone and Marble Centre", while the USM alone comes in the next place.
11. To run the task of "data analyses" of the Business Intelligence Process. It is observed that decision makers perceive that the optimal solution is to perform this task jointly by (the USM, Palestine Stone Centre and an expert). While, the Palestine Stone and Marble Centre comes in the second place.
- 12 For the "communication" task, the USM comes in the first place, followed by the USM and Palestine Stone and Marble Centre.

7.2 Final Recommendation

The last dimension of the Decision Aiding Process (DAP) is the formulation of the final recommendations. Bouyssou *et al.*, (2006) argue that three conditions have to exist when formulating the final recommendations:

- To be technically sound, no meaningless or incorrect recommendation should be undertaken.
- To be operationally complete: The recommendation is understood by the client, it is useful for him and he is able to apply it, and.
- The recommendation should be legitimated by the client.

It is worth mentioning that the final recommendation is the translation of the evaluation process into a format that can be applied by the client. Based on these characteristics of the final recommendations and in order to enhance the business information services of the USM, the research makes the following recommendation:

- In the short term: The USM has to cooperate with other organizations, mainly the Palestine Stone and Marble Centre at the Palestine Polytechnic University and with an expert if needed, mainly, for the data analyses task of the BIP. The researcher argues that currently, the USM lacks the resources and capabilities to run the tasks of a BIP alone. In addition, The USM can benefit from the huge resources available at the PPU to support the USM achieving its goals. Meanwhile, concerning technical and know-how related information, the PSMC is still the main source of such information, even in the medium or long run.
- In the medium term: The focus will be on the organizational learning. At this stage, The USM should organize tailored-made training courses and capacity building programs to improve skills of the USM team in the field of BI.

Moreover, sharing experience from experts in BI domain is important to ensure that the USM can run the BI system at the long run.

- In the long term: The information services at the maturity stage. At this stage the USM can rely on its own resources and capabilities to run a BI system with a minimal support from outside. The USM can provide a tailored-made information services, keeping in minds that different stone and marble SME exhibit different information needs. Here, the USM can ask for fees against high value-added intelligence and business information reports

The researcher discussed these recommendations with the key decision makers at the USM. Mainly, the chairman and some members of the Board of Directors, in addition to the senior staff at the USM. The stakeholders expressed their satisfaction about these recommendations, they declared their willingness to apply them. Meanwhile, the researcher has a concern about commitment of the top management to support the implementation of these recommendations on the ground. In particular, when a budget is asked to be allocated for this mission.

7.3 Limitation of the study

The research limitation points to the characteristics of design or methodology that constrain the generalization of the result (Price& Murnan, 2004). In this case study, the researcher argues that there a number of limitations that needed to be mentioned in relation to this study. These include:

The sample number of the decision makers at this case study is very limited to generalize the result. For example, 3 participants represented the stone and marble members at the USM from more than 8 hundreds.

- The experience of the decision makers in the field of the business intelligence is very limited. The same applicable to their methodological knowledge of decision aiding.
- The Promethee methodology does not explains how to allocate weights for different criteria. This still depends on the perceptions of the decision makers.
- At all cases decision aiding has both objective and subjective aspects. The formal decision aiding process points to the objectivity of the process as it is a well design process. Conversely, decision maker's preferences, either in selecting the evaluation criteria, their weights, their thresholds and the performance evaluation of each action are clear examples of subjectivity.

Therefore, the researcher argues that it is difficult to generalize the result of this study to other cases. Keeping in mind, again that decision making is unique and still depends to high extent on the preference of the decision makers themselves.

7.4 Suggestions for Further Studies

The researcher suggests to carry out further study to fill the gap in the informational role research of the BMOs. Therefore, the researcher argues that BI implementation at BMOs should be further studied by experts on the domain. Such panel of experts might be able to conduct similar studies, while by developing quantitative criteria to get more precise result.

In addition, the researcher recommends carrying out similar researcher by employing other decision aiding methodology such as ELECTRE or AHP. This enables comparing the result of different methodology to evaluate the validity of the results.

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Appendix A

CONSENT LETTER



Dear Sir/ Madam,

This is to certify that **Mr. Maher Hasan Ahmad Hushayish** is a PhD student in Information and Communication Sciences Program, *Université Polytechnique Hauts-de-France*. He is writing to request permission to join a decision workshop in order to obtain data needed to evaluate the options of the optimal Business Intelligence System model for the Union of Stone and Marble Industry in Palestine. He is currently studying “**a multi-criteria decision analysis for business intelligence: the case of a membership-based organization**” under the supervision of Associate Professor Dr. Michel Labour’s and Associate Professor Dr. Igor Crevits. Your cooperation will be highly appreciated. I would be pleased to share the results of this study with you if you are interested.

If you have any questions concerning this study, you can contact the researcher at Tel: +972-2-2776393, Mobile: +972-599-676001, or maher@usm-pal.ps

Sincerely,
Maher Hushaysh