T.C.
UNIVERSITY OF GAZIANTEP
GRADUATE SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION

# RELATIONSHIP BETWEEN INSTANT MESSAGING, SOCIAL NETWORKING, KNOWLEDGE SHARING and TEAM WORK PERFORMANCE

**MASTER'S THESIS**

AHMAD ISMAIL

Supervisor
Asst. Prof. Dr. Özlem Yaşar Uğurlu

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SOSYAL BİLİMLER ENSTİTÜSÜ
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**Anlık Mesajlaşma, Sosyal Ağ, Bilgi Paylaşma ve Takım Performansı Arasındaki İlişki**

Ahmad ISMAIL

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Ahmad ISMAIL

Date of Viva: 22.01.2018

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I certify that this thesis satisfies all the requirements as a thesis for the degree of Master.

Prof. Dr. Arif ÖZSAGIR
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This is to certify that I(we) has(have) read this thesis and that in my(our) opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master.

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Supervisor

This is to certify that we have read this thesis and that in our opinion it is fully adequate by unanimous vote/a large majority, in scope and quality, as a thesis for the degree of Master.

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## ETHICAL DECLARATION

I certify the following the statements to be correct for the thesis study that I prepared according to University of Gaziantep, Graduate School of Social Sciences, Department of Business Administration Thesis Guidelines;

- I have obtained the data, information and documents I have given in the thesis under the academic and ethical rules,
- I have presented all information, documents, evaluations and results in accordance with scientific ethics,
- I have cited the resources that I have used for this study,
- I haven’t changed the data used in this study,
- The study presented in this thesis is unique.

I hereby declare that I accept all consequences which may arise in case otherwise.

Ahmad ISMAIL

# ÖZ

## ANLIK MESAJLAŞMA, SOSYAL AĞ, BİLGİ PAYLAŞMA VE TAKIM PERFORMANSI ARASINDAKİ İLİŞKİ

İSMAİL, Ahmad
Yüksek Lisans Tezi, İşletme ABD
Tez Danışmanı: Yrd. Doç. Dr. Özlem Yaşar Uğurlu
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Modern teknoloji insan hayatını her yönden etkilemektedir. Bireyler ve gruplar arası iletişim yöntemleri de her geçen gün değişime uğramaktadır. Ortaya çıkan yeni iletişim yöntemleri de gündelik yaşamın vazgeçilmez bir unsuru haline gelmiştir. Anlık mesajlaşma hizmetleri hayatımıza kısa süre önce girmesine rağmen iletişim yöntemlerini kökten değiştiren uygulamalar olarak karşımıza çıkmaktadır. Kullanılan mobil cihazların yetenekleri ile doğru orantılı olarak anlık mesajlaşma yetenekleri de önemli bir gelişme göstermiştir. Hızlı, kolay ve geniş çerçeveli iletişime olanak sağlayan teknolojiler, topluluklar tarafından hızlı bir şekilde benimsenmiştir. Bilginin paylaşımı bu araçlar sayesinde örgütsel açıdan yeni anlamlar kazanmıştır. Çalışma için gönüllülük esasına göre, 20 yaşından büyük ve Dünya Gıda Programında (WFP) ve Birleşmiş Milletler Uluslararası Göç Ajansında (IOM) çalışan 188 katılımcıya anket uygulanmıştır. Anketten toplanan veriler için uygunluk örneklemi ve doğrulama için faktör analizi kullanılmıştır. Çalışmanın sonuçlarına göre anlık mesajlaşma kullanımının sosyal ağ ve bilgi paylaşımı konusunda önemli katkılar sağladığı tespit edilmiştir. Bu çalışma ile iş yerinde anlık mesajlaşma hizmetlerinin kullanımı ile bilgi paylaşımı, sosyal ağlar ve takım performansını arasındaki ilişkinin açıklanması amaçlanmıştır.

**Anahtar Kelimeler:** Anlık Mesajlaşma, Sosyal Ağ, Bilgi Paylaşma, Takım Performansı

## ABSTRACT

### RELATIONSHIP BETWEEN INSTANT MESSAGING, SOCIAL NETWORKING, KNOWLEDGE SHARING AND TEAM WORK PERFORMANCE

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Modern technology affects human life in every aspects. Communication methods between individuals and groups are changing continuously. The new communication methods that have emerged have become an indispensable element of everyday life. Although instant messaging services have entered our lives a short while ago, these applications radically change the communication methods. Instant messaging capabilities have also shown a significant improvement in direct proportion to the capabilities of the mobile devices used. Technologies that enable fast, easy and wide-frame communication have been quickly adopted by communities. The sharing of knowledge has gained new meanings in organizational terms with these tools. A questionnaire was conducted to 188 participants aged 20 years and older and working in the World Food Program and the United Nations Migration Agency on a volunteer basis for the study. Convenience sampling and factor analysis for validation were used for the data collected from the questionnaire. According to the results of the study, the use of instant messaging has been found to provide important contributions to social networking and knowledge sharing this study aims to explain the relationship between the use of instant messaging services at work and information sharing, social networks and team performance.

**Keywords:** Instant Messaging, Social Networking, Knowledge Sharing, Team Performance

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# SECTION ONE
# INTRODUCTION

## 1.1. Introduction

The concept of instant messaging has been popular with the widespread use of SMS services in 1990s. There has been a transformation from that time and smart devices that enable internet access everywhere changed the tools people use for instant messaging. The rapid development of mobile device technologies, like every other area, is also influential in the field of education, where access to training and information or resource sharing is becoming commonplace. IM tools are widely used in modern work environments. Thus it is important to reveal the influence of such tools in the context of social networks, information sharing and teamwork performance. IM tools are very popular among individuals, but the literature on the subject is limited in contrast to the widespread use of these tools in work environments. This study focuses on to provide an insight about the subject and hence to present valuable contributions to the literature.

Knowledge is the main power of today's business organizations. It is impossible to achieve success without having knowledge. But knowledge, which is an abstract concept, consists of information about everything related to work. This pool of information is becoming bigger and bigger every day, so it is important for organizations to manage this pool of information and to provide employees correct and updated information continuously. IM tools are very useful for this purpose. The main objective of this study is to reveal the relation between IM usage at work and social network, knowledge sharing and teamwork performance.

Coordination is the basis of a good working team and it is assured with effective communication.

Modern technology offers various communication methods for organizations and it is imperative to follow and implement these technologies for organizational benefits.

Questionnaire method was used in this study to obtain relevant data. Then analyses are made with Mplus to see the relationship between the concepts of social network, knowledge sharing, teamwork performance and the use of IM tools.

Sample size of the study can be expressed as a limitation. Sampling is wide enough to conduct analysis,

The computer mediated communication, instant messaging and social media concepts are analyzed in this manner to form a conceptual framework in the study. Knowledge is the most important tool for achieving success in today's world. Thus, transferring and sharing knowledge is of great importance for modern communities.

According to the scientific management principles, it is argued that the division of work into small pieces and the continuous execution of each task by one person increases efficiency and productivity. This leads us to the concept of team performance which is also discussed in the second section of this study.

Instant messaging at work and its relationship with knowledge sharing, social media and team performance is investigated in the third chapter of the study. Methodology used, hypothesis and sampling are also presented in this chapter. This study aims to fill the literature gap about interrelations of the mentioned factors.

Results of the questionnaire are reviewed in the fourth section with suggestions and limitations

# SECTION TWO
# LITERATURE REVIEW

## 2.1. Computer Mediated Communication and Instant Messaging

Computer mediated communication dates back to World War II, to the times of the invention of the first digital computer. Researchers found out e-mails that had been exchanged as early as 1960's. Still, they were considered as prototypes of what people facilitate in communication today. In the short history of computers, last two decades witnessed profound changes in computer technology. Computers become personal as it was what can be considered as technical and highly expertise. As computers became popular and personal, computer mediated communication has integrated into people's lives (Thurlow, Lengel, & Tomic, 2004).

In early 1990's computers were still used for academic and practical purposes such as data transfer and information processing. By mid-1990's personal computers spread to work places and began to be used by schoolteachers, doctors, and office managers. From then on, popularized computer mediated communication has turned into a beckon that gathers scholarly attention (Thurlow, Lengel, & Tomic, 2004).

As in simple terms, computer mediated communication means any human interaction by means of computer technology. Yet, it would be useful to look at some definitive explanations on the concept. In a broader sense, CMC involves any virtual interaction with computers including various applications as a part of human communication (Santoro, 1995). CMC is also defined as a process involving computers to human communication in a given context in which participants shape media for different purposes (December, Transitions in Studying Computer-Mediated Communication, 1995). Last but not least, CMC is defined as a type of communication where human beings communicate by means of computers (Herring, 1996).

There are mainly two modes of CMC as synchronous and asynchronous. While the interlocutors are online in the synchronous modes of CMC, a whole message of texts is written to be read later in asynchronous modes (Perez, 2003).

### 2.1.1. Definition of Instant Messaging

In its broadest sense, Instant Messaging (IM) can be defined as a mode of computer mediated communication, which allows the users to synchronously communicate with one another. That is, people using the same IM platform are able to chat with each other as long as they have an internet connection (Grinter & Palen, 2002). Furthermore, to elaborate the definition, it is possible to mention that IM enables its users with the help of computer networks to transfer text messages. Another prominent feature of IM is that it provides an almost real-time communication opportunity as it is one of the synchronous modes of computer mediated communication platforms (Asteroff, 1987, p. 47).

Within the literature, various definitions have been offered to describe Instant Messaging. Therefore, it is believed to be useful to discuss those definitions in order to have a better understanding of what IM refers to. Campbell et. al. (2002, p. 2) suggests that IM refers to the exchange of communicative expressions between people using the particular IM software in almost real-time. Furthermore, Hedbring (2002, p. 3) defines Instant Messaging as the private communication between individuals familiar with one another, which resembles face-to-face communication with its communicative characteristic allowing people to perform one-to-one exchange of expressions. Leskovec and Horvitz (2008) notes that IM applications allow their users to exchange short text messages with people in their contact lists whenever they get online. Also, the shortness of those text messages is associated with loose grammar, abbreviations of certain words, and punctuation mistakes. Another definition of IM mentions that it covers the activities of sending and receiving text messages using a computer, a mobile phone, or a tablet. Besides, it allows people to exchange those text messages almost synchronously (Koutamanis, Vossen, Peter, & Valkenburg, 2013). Although suggested definitions are not limited to the ones mentioned here, the provided definitions in the literature are seen to generally focus on similar points. Those points can be summarized as follows (Jones, 1997, p. 69):

- IM users can exchange messages with one another.

- IM use may lead to a use of informal language.
- IM is a text-based platform in terms of the form of messages.
- IM allows people to have contact lists consisting of people who are familiar with one another.
- IM allows an almost real-time exchange of messages.

IM networks include both servers and clients. A person willing to use an IM network installs the software and signs up as a client of the particular IM service. Therefore, they are given the opportunity to add other users as friends and to see when they get online by using their IDs or nicknames. However, it should be mentioned that not all the software operates on the same protocol. In other words, it is not possible to connect to a "friend" by using two different software, which is provided by different companies. To solve this problem, various companies developing IM software have launched IM software that is able to operate on dual-protocols. For example, it is possible to login on Facebook Messenger by using Skype's software (Chen K. J., 2008, p. 24).

In terms of the functions of IM software, four main points can be mentioned. First of all, people using the same IM are given the opportunity to declare their mental state to their "friends" by using a mood message. Secondly, users of an IM software are able to send and receive text messages near real-time. Thirdly, people using the IM software are able to form a contact list, which allows them to communicate with their friends or family members in real-time. That is, it is possible to create group discussions to act like a real-life experience unlike forums, in which people need to wait for others to read and articulate long answers. Lastly, IM software and databases offer users to have storage in which people are able to share their personal files such as music, picture, and videos (Chen K. J., 2008, pp. 24-25).

As IM can be considered as a new medium enabling people to communicate, its communicative functions should also be discussed. Nardi et. al. (2000) defines the following communicative functions of IM:

- Quick questions and clarifications,
- Coordination and scheduling,
- Immediacy,
- Elimination of formalities,

- Rapid responsiveness,
- Coordination of spontaneous meetings,
- Communication with friends and family.

As IM allows people to ask quick questions and clarifications, people tend to use instant messaging rather than e-mail about small details on the subject that they are working on. Furthermore, as IM is characterized by almost real-time communication, immediacy plays an important role in the coordination and scheduling of certain details on an issue as well as enabling the people in an organization to gather an impromptu meeting. Moreover, another important communicative function of IM is the elimination of formalities, which can be related with another characteristic of IM software, the use of informal language. Lastly, communication with friends and family during work hours is another communicative function of IM as people tend to constitute their contact lists with people whom they are familiar with (Shonk, 1997, p. 127).

Apart from these characteristics and functions, it should be noted that IM lacks most of the dimensions of traditional ways of communication as it lacks body language, physical context, voice tone, facial expressions, gestures, and mimics. That is, interpersonal communication at the IM level may not be as efficient as traditional ways of communication, lacking the visual and contextual necessities for effective communication (Jones, 1997; McQuillen, 2003). Furthermore, as IM is mostly text-based, it can be seen that it may cause a sense of impersonality. For instance, when people use traditional ways of communication such as face-to-face communication, the conversation is simultaneous and spontaneous in nature. Also, traditional ways of communication include body language so that there are other indicators of expression. However, conversations via an IM software lacks the body language while annihilating the spontaneity as people are able to alter and arrange the message they tend to transmit. Thus, although it offers almost real-time conversations, it is possible that and IM message may resemble a highly formal e-mail text (McQuillen, 2003; Wilkins, 1991).

At this point, it is important to mention emoticons, which can be argued to be used as a substitute for body language or other dimensions of traditional ways of communication. Although the existence of emoticon use is documented in e-mail conversations as “relational icons” as early as the late 80s (Asteroff, 1987), the term

emoticon is closely associated with IM software today. Until the first mentions of emoticons in the literature, various definitions have been offered. For instance, Sanderson and Dougherty (1993) claims that emoticons are a sequence of typical characters that can easily be formed with a computer keyboard. Also, the definition provided by Rezabek and Cochenour (1998) argues that emoticons are visual indicators created by using typical symbols, which symbolizes certain emotions when they are read sideways. Thompsen and Foulger (1996) claims that the use of emoticons or “pictographs” is related to people’s intention to substitute other non-verbal communication dimensions such as body language and gestures. Therefore, in the literature regarding computer mediated communication, it can be seen that even the most primitive modes of emoticons are considered as the probable substitutes for non-verbal components of communication.

Following the popularization of emoticons, a new mode for the substitute of non-verbal components for communication began to flourish, which are known as emojis. These icons are “picture characters” which were introduced on mobile phones in the late 90s in Japan. However, the popularization of these icons has only recently begun when people started using smart phones, which can render emojis. The basic comparison between emojis and emoticons is that emoticons are formed via ASCII character cues while emojis are represented with Unicode characters (Pavalanathan & Eisenstein, 2015). Figure 2.1. can be used to see the visual difference between emojis and emoticons.

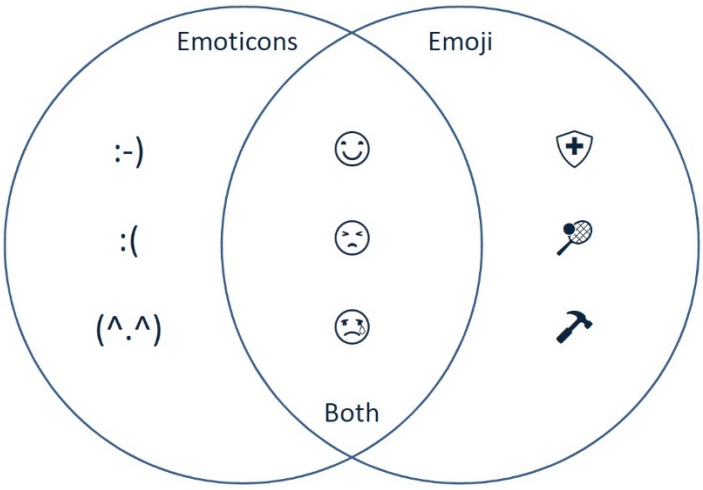


**Figure 2.1.**Emoticon vs. Emoji (StackExchange, 2016)

Apart from emoticons and emojis, Chen (2008) lists five other characteristics of Instant Messaging services that implemented to correspond with the traditional ways of communication:

- Traditional telephone calls: Software such as Skype and WhatsApp allow their users to carry out telephone calls via their applications.
- Variability of use: Companies offering IM software provides extensions and add-ons that enable people to use the program on web browsers or on their computers.
- Chat history: People are able to record their chat history with the help of IM software. Chat history covers text messages, and audio and video recordings.
- Blog: Some IM software allows people to keep blogs.
- Web TV: Some IM software (i.e. China's QQ) integrated Web TV, giving its users the opportunity to benefit from the new technology.

### 2.1.2. Historical Development of Instant Messaging

In order to have an understanding of how Instant Messaging applications of today have changed, it is necessary to look at the historical development of the concept. Although the concept of Instant Messaging began with the introduction of ICQ in the mid-90s, its precursors should also be mentioned in order to understand the development process of these applications and software (Merriam-Webster, 2017).

#### 2.1.2.1. Precursors of instant messaging

The first precursor of instant messaging services is believed to be the *.SAVED* (dot saved) tool developed under the Compatible Time-Sharing Systems of MIT Computation Center. The system, developed in 1961, was able to allow up to 30 users to connect to the server at the same time to communicate with one another. Written and developed by Tom van Vleck and Noel Morris, *.SAVED* tool is known to give its users the opportunity to message instantly with the help of a user interface (van Vleck, 2001).

During the period between the late 70s and 80s, the emergence of peer-to-peer protocols can be seen. With these protocols, people were able to connect to other computers within the same network. Thus, peer-to-peer protocols allow the

users to communicate with other users in the network, which can be argued to be one of the first concepts contributing to the idea of instant messaging (de Hoyos, 2016). Considering the development of these protocols, one can easily claim that people have always been inclined to create social networks with the use of computers and technological devices.

Unix chat program *talk*, which was released in the mid-80s, can also be considered as one of the precursors of the idea of instant messaging. Although the program did not include presence information, with the use of Unix commands such as *finger*, the program may be argued to provide the characteristics of instant messaging. Another antecedent of instant messaging is the Zephyr Notification Service, developed at MIT as part of Project Athena in 1987. With this service, developed within Unix, prominent characteristics of instant messaging such as near real-time communication and presence information could be seen. Although Zephyr was first developed with the intention of sharing short notifications with the users, it turned into a one-to-one communication service in time. Also, the protocol is still in use by institutions such as Carnegie Melon University and MIT (Salin, 2004; Petronzio, 2012).

Bulletin Boards Systems (BBS) should also be mentioned as they also became popular before the introduction of today's standard instant messaging software. When people began to form computer networks in the 80s, BBS platforms became widespread as they allow people to connect and communicate with one another. People were able to connect to these systems with their modem connections via their telephones. Those BBSs were text-based and generally run by hobbyists. Most of these BBSs have turned into websites that could be connected with an internet connection with the popularization of the internet in the mid-90s (Gaiser & Schreiner, 2009; Edwards, 2016).

Internet Relay Chat (IRC) is also another precursor of instant messaging software of today. Released in 1988, IRC allowed its users to conduct real-time conversations. Also, it provided presence information as people were able to see when someone gets online. It is possible to regard IRC among typical IM applications; however, as it was not designed for one-to-one conversations, it is still considered as an antecedent of instant messaging. The main purpose of IRC was to allow people to participate in group chats entering into channels (typically shown with a # at the left end) (Salin, 2004). However, it should be noted that it is possible

to have private conversations as well as sharing files with the users in today's IRC applications such as mIRC.

#### 2.1.2.2. Early years of instant messaging

The emergence of Instant Messaging software in its modern sense almost coincides with the popularization of the internet in 1994. The effects of internet at the turn of the 21st century can be argued to resemble the effects telephone in the 20th century. That is, with the introduction and widespread use of the internet, long-distance one-to-one communication became possible, bringing about globalization characterized by rapid and constant change (Cheuk & Chan, 2007).

Accordingly, the development of modern instant messaging applications and software started in 1996 when 4 Israeli entrepreneurs decided to develop a way of communication on the internet. Yair Goldfinder, Arik Vardi, Sefi Vigiser, and Amnon Amir established a company named Mirabilis, which would then introduce a new peer-to-peer communication technology with the name of ICQ. Having observed the potential of the internet and the lack of communication tools despite the high number of internet users, these 4 entrepreneurs can be argued to saw the opportunity to inter-connect these users to create a social network (Stewart, 2001).

In terms of the features of ICQ, it can be mentioned that it has a user-friendly interface informing the users when someone from their contact lists gets online and allows people to instantly communicate with one another. Other features of ICQ are chatting, sending and receiving files, configuring it to work with other programs, and playing games. Furthermore, ICQ could be minimized on the screen when surfing the internet. When minimized, it informs the user when a person in the contact list gets online. With the help of ICQ, users are able to not only participate but also initiate conversations by selecting the user they want to chat with (Leung, 2001, p. 484).
Following the success of ICQ, in 1997, America Online (AOL) introduced its own instant messaging application, known as the AOL Instant Messenger (AIM). Furthermore, as AOL noticed the growth of ICQ, it bought Mirabilis in 1998 (Salin, 2004).The new features introduced in AIM were "away messages, profiles for users, and icons" (Petronzio, 2012). As AOL was dominating the user base in the United States, ICQ was popular in Europe and Asia (Baron, 2013).

Having seen the opportunity in the new way of communication over the internet, both Yahoo! and Microsoft released their own instant messaging software

before the millennial turn. In an attempt to gain competitive power, they introduced new features along with instant messaging. For instance, Yahoo! Messenger was offering these features in 1999 claiming that the users would have means to access the information they desire (Carriere & Bourque, 2009, p. 35):

- Instant Messages,
- Simultaneously communicating and surfing on the internet.
- Notifications for the users when they receive an e-mail on their Yahoo! Mail accounts.
- Personalized news information.
- The ability to block messages from unwanted users.
- Integrated registration with all the services of Yahoo!.

With all these developments and the release of various IM software, the problem of interoperability became the main question. As people started to use different software provided by various companies such as AOL, Yahoo!, or Microsoft, a necessity emerged as users of this software wanted to communicate with one another using a protocol allowing people to communicate with one another. In an attempt to provide a solution, Microsoft added a feature in MSN messenger by which people could have conversations with their friends using AIM messenger. However, this attempt was probably perceived by AOL as an illegal way of using their services. Therefore, AOL blocked MSN Messenger to use its services without authorization as the company wanted to sustain its competitive advantage in the market (Hu, 2002).

In 1999, Internet Engineering Task Force (IETF) addressed the issue of interoperability, which led to the foundation of Instant Messaging and Presence Protocol (IMPP). The main aim of this workgroup was to designate the obligations and the roadmap for the development of a protocol that could solve the problem of interoperability. As IMPP was not able to decide on a common instant messaging protocol, the attempts of three workgroups were accepted in the market: Application Exchange (APEX), Presence and Instant Messaging Protocol (IMXP), and SIP for Instant Messaging and Presence Leveraging Extensions (SIMPLE) (Salin, 2004).

Along with these protocols, another competitor based on the idea of open-source development entered the competition, which would take the leading position among these protocols. Jabber, first developed by Jeremie Miller in 1998, was

released in 1999. The aim of the Jabber community was to develop a protocol that would facilitate the open conversation between people using different IM systems. Although the registration on the server was discontinued in 2013, the protocol became the main determinant in terms of instant messaging as companies were trying to develop instant messaging systems that are compatible with Jabber protocol (Saint-Andre, Smith, & Tronçon, 2009; Jabber, 2017; XMPP, 2017).

After the millennial turn, the first half of the decade witnessed various IM software such as Skype and iChat by Apple. As other competitors of AIM, these applications attempted to offer more than instant messaging services. For instance, Skype integrated video and voice calls, which makes it more sophisticated than text-based instant messaging software. On the other hand, iChat (which is now named as Messages) allowed its users to integrate their contact lists, and Apple Mail accounts into the software, which was also compatible with AIM (Petronzio, 2012).

In 2005, Google Talk was released by Google, which is discontinued as of June 26, 2017, and replaced by Hangouts which was released in 2013 (Google, 2017). Google Talk service used to be accessed through various applications as well as on Gmail window. With Google Talk, users were able to have text-based conversations, and video and voice calls (Petronzio, 2012).

#### 2.1.2.3. Domination of social media and smart phones

After 2005, the nature of instant messaging began to be characterized by social media. For instance, in 2006, a big social media platform MySpace became the first one among other social media platforms to release its own instant messaging service with the name of MySpaceIM. However, as MySpace faced a decline with the popularization of Facebook and Twitter, MySpaceIM was integrated with Skype (Petronzio, 2012).

In 2008, gaining a considerable worldwide widespread usage, Facebook released its own instant messaging service as Facebook Chat, giving its users the opportunity to have real-time conversations with their friends. With the help of Facebook Chat, Facebook users were also able to have a conversation with people in Facebook Groups apart from the people they added as their friends. In time, owing to privacy concerns, Facebook needed to take security measures such as the implementation of “message requests” in order to cope with spam messages. In 2011, Facebook’s chat feature was integrated into Skype so that people have been able to

connect to Skype with their Facebook accounts (Smock, Ellison, Lampe, & Wohn, 2011; Petronzio, 2012).

In 2009, WhatsApp was released. Having seen the opportunity with the popularization of smart phones, WhatsApp group introduced the application as an alternative way of communication, especially trying to uproot SMS. The application, which can be executed on various platforms ranging from Android phones to iOS and even web browsers, allows its users to exchange various data such as pictures, video clips, gifs, audio files, and location information along with text-based messages in real-time. Probably the most important characteristic of the application is that it allows a cost-free way of communication as long as there is an internet connection. And considering the fact that almost all data carriers now offer internet plans in their monthly subscriptions, WhatsApp is considered as the costless way of communication by people. Therefore, considering all these factors, it is no surprise that WhatsApp has become one of the leading instant messaging applications for smart phones with a user base over 1 billion people around the world (WhatsApp, 2017; Church & de Oliveira, 2013).

Since WhatsApp's revolutionary entrance into IM market, various applications and software have been developed both under the influence of Social Media and Smart Phones (either Android or iOS). As each of these applications has their own unique characteristics and features to gain a competitive advantage in the market, an overall view of these is believed to be useful. In order to have a general understanding of todays IM applications dominating the market, Table 2.1 can be used as a reference point.

**Table.2.1** Leading IM Applications in the Market

| IM Application | Characteristics | Unique Characteristics |
|---|---|---|
| **WhatsApp** | It is easy to install.<br>Various data ranging from text-based messages to gifs can be shared. | It is ad-free.<br>It's cost-free as long as there is an internet connection. |
| **Skype** | It mainly focuses on video calls.<br>It allows interoperability between various IM platforms such as Facebook Messenger and Hotmail accounts of MSN Messenger. | It is possible to call landline telephones with lower costs. |
| **Telegram** | Messages exchanged between people are encrypted. | It has a secure mode.<br>It does not keep a record of the sent and received messages. |
| **Viber** | It mainly focuses on audio calls.<br>It is also possible to use the application as a regular IM service by sending and receiving text-based messages. | It is possible to call telephone numbers that are not connected to Viber. |
| **Blackberry Messenger** | It is possible to send time messages.<br>There is a "retract" feature allowing people to remove the message after sending it. | It has a special PIN system. |
| **Facebook Messenger (or Messenger)** | It allows messaging between Facebook users. | It can also be used as an IM application without having to register a Facebook Account. |
| **WeChat** | There are various features such as Friend Radar to find other users around them. | It dominates the Chinese market of IM applications. |
| **Yahoo Messenger** | It offers a cloud-based picture sharing feature. | It has an offline mode.<br>There are social media features within the application. |
| **PlayStation Messages** | It is chat developed for PlayStation users to communicate with one another. | Its main focus group consists of gamers. |

(de Witte, 2016)

### 2.1.3. Use of Instant Messaging at Work Place

Instant messaging impacts are positive on the communicative environment of a workplace. When employees are content with their communication, their organizational competences develop. Job satisfaction and performance in workplace are the outcomes of a satisfactory communication environment in a workplace. Still, certain modes of communication have various effects on different people. Thus, there is a need for further research on workplace communication strategies (Carriere & Bourque, 2009; Goris, 2007; Ilozor, Ilozor, & Carr, 2001; Orpen, 1997).

Instant messaging has proved itself to be a sufficient and beneficial way to connect people in the workplace. It helps the employees to improve working relationships and social connections. It is also a great relief for big scale workplaces as the connection between departments can be established by instant messages (Huang & Yen, 2003). Thus, instant messaging became prevalent in workplaces. As a communication tool, instant messaging let employees know who online, exchange

messages in real time is. It is also a cost-effective software (Cameron & Webster, 2005).

IM allows the employees to share spontaneous and instant conversations that support teamwork and information sharing. IM also allows working colleagues to focus on their performances as a team. IM results in positive working teams as it helps the employees to build mutual trust (Cho, Kim, & Trier, 2005; Ou, Davidson, Zhong, & Liang, 2010; Davidson & Ou, 2011). A workplace can benefit from increased information sharing and communication thanks to IM as it encourages the employees to team up and work together (Cho, Kim, & Trier, 2005; Ou, Davidson, Zhong, & Liang, 2010).

Various studies have proved that IM improves the quality of teamwork as it is beneficial mostly for the discussions of complex tasks. In a study which compared e-mail and IM to see which generate new ideas more, it is found that groups which are using IM come up with more ideas (Huang, Hung, & Yen, 2007). It is suggested that the instantaneous and spontaneous nature of IM encourages all the team members to brainstorm. Moreover, the fact that the messages are shared without delay increases the urge to write a new idea. In other words, rapid responses support team interaction (Quan-Haase, Cothrel, & Wellman, 2005). IM also empowers the social relations of the working colleagues with its contact list and opportunity of instant interactivity.

IM allows workers to share information in an instant with its informal nature. Its facility to be personalized also helps its users to build and improve social relationships. IM's existence allows people from distant locations, departments, campuses or cities to enter into a virtual communication with each other otherwise would be impossible. It also helps working teams which are located in separate places to build relations. However, the results of the researches have shown that co-workers who are located in the same building or environment, that know each other personally are more comfortable when establishing a computer mediated communication network. That is to say, IM is more successfully used amongst the colleagues who already have an acquaintance with each other (Cho, Kim, & Trier, 2005).

Researchers have proved that employees who believe IM is fit for work purposes are the ones who found that the software provides more information (Huang & Yen, 2003). It also made understanding easier and proved itself to be

effective. However, the reason for people to find IM facilitating differs whether they use it on their leisure times or during their work hours.

A study has shown that in work places employees are depended on IM or e-mail rather than a face-to-face conversation. Use of e-mail and IM double the time of a face-to-face or a telephone call. E-mail holds the first place as an informal communication mode and IM comes as the second. Yet, IM offers a greater connectivity opportunity. Being logged on to IM work colleagues signal that they are online and available for a conversation. This allows working colleagues to give feedback and immediate assistance to each other when needed. In work places which have flexible hours, IM enables an organizational control over employees as their online and offline status can be seen by their colleagues. The sense of community that is created awakens discomfort in users of IM when they do not answer their co-worker's messages. There is a chance that unanswered messages indicate disrespect and negligence towards the working colleagues. In order to solve such misunderstandings and to sustain accountability co-workers use auto replies (Quan-Haase, Cothrel, & Wellman, 2005).

In the business world, IM is considered as the fastest and most effective software as it enables organizations and departments located in different cities and countries to interact (Hunt, 2009). As a mode of communication, IM comes before other communication channels as it provides socializing, knowledge sharing, feedback, clarification as well as ease of scheduling. IM is mostly used for work-purposes, yet the more skilled the users get in chatting, the more they spend time with IM (Muller, Raven, Kogan, Millen, & Carey, 2003).

Workplaces often support computer mediated communication; thus IM is integrated into the workplace without hesitation. Notifications that indicate new messages are displayed on computer screens immediately, on top of applications in use. Employees have to click on that notifications and read the instant messages if they wish to continue to work in other applications or programs. Some IM programs offer busy mode as well as online and offline modes, enabling users to know if the worker is available for a conversation. Although users have the opportunity to switch their current status, they do not bother to do so (Garrett & Danzinger, 2007; Stieger & Göritz, 2006).

In another study, it is found that there are two different kinds of IM use. On the one hand, there are heavy users who have skills in fast-pace chatting in multiple

conversations. They incline to split their thoughts to multiple messages in the same conversation. They also prefer to move out from chat windows to carry out different tasks. Heavy users tend to use IM to chat with other heavy users for collaborating and working on projects. On the other hand, there are light users who prefer to use IM to organize schedules and coordinate with others. They also ask for feedbacks and clarifying questions. Their pace is slow while chatting and they tend to write longer conversations with fewer messages. They do not prefer to carry out other tasks while chatting. According to various findings, instant messaging in workplace is fundamentally used for complex discussions on work and people are not inclined to switch to another communication medium as the conversation becomes more complex (Isaacs, Walendowski, Whittaker, Schiano, & Kamm, 2002)

Garret and Danziger (2007) carried out a study that investigates both users and non-users of instant messaging to evaluate the level of interruption IM cause in a working environment. A nationwide random telephone survey was used. 912 people were surveyed out of 1200 expected participants. The participants of the survey were people working full-time who use a computer more than half of their working hours. The questions on the survey were about the characteristics of their job, the technology environment, organizational characteristics and personal traits. The results surprisingly revealed that IM users had lower levels of interruption than non-users during tasks related to work. Although IM functions increased the frequency of communication on a computer mediated environment, it provided briefer interactions than traditional modes of communication. Hence, it did not lead to major disruption from a work task. The researchers claimed that IM users were comfortable with negotiating on when to communicate and collaborating at low-intensity when it is less interruptive for them.

Finally, as IM is integrated into work practices more and more, users may become more relaxed and comfortable to respond when they are available (Garrett & Danzinger, 2007). Although interruptions cannot be prevented in a working environment, they can be kept at minimum. Workplaces that adopt instant messaging and computer mediated communication should train their employees in using instant messaging. Furthermore, the trained employees will benefit from the advantages of IM and be productive rather than get interrupted at all times when a message appears on top of the screen (Mark, Gonzalez, & Harris, 2005).

## 2.2. SOCIAL NETWORK IN WORK SETTINGS

So as to provide an overall and comprehensive insight into social network in work settings, it is useful to discuss what social networks as a concept refers to. Furthermore, four essential approaches and theories regarding social network studies should also be discussed. Therefore, in the chapter of the literature review, it is attempted to define the concept of theories are discussed to enhance the perspective regarding social network.

### 2.2.1. Definition of the Concept of Social Networks

Social networks as a term, was first used by Barners in **Invalid source specified.**, to define an individual's relationship between other people around him/her. According to Barnes (1954), social networks consists of individuals who are interacting with one another. Also, it is possible to argue that those individuals have psychological importance for each other.

In the literature, it is possible to find various definition of the concept of social network. For instance, using technical definition, O'Malley and Marsden (2008) argues that a social network emerges out of the relationships and social ties between two or more elements known as nodes or actors. Sandars (2005) states that social networks consists of human beings and the relationships that facilitates the relationship between those human beings. Kolaczyk (2009) expresses that social networks represents the social interactions between the social beings within a community of actors.

These specific examples can be given to exemplify the social interactions so as to concretize the idea of social network, which is attempted to be described with abstract definitions (Kolaczyk, 2009):

- Friendship between individuals,
- Membership of people in social communities and groups,
- Relationship between individuals from secret meetings to sexual relations,
- Collaboration to reach a common target,
- And exchange of resources.

Therefore, from these examples of social interaction, Kolaczyk (2009) asserts the following examples, which can be considered as social networks:

- Friendship between children at school,
- Sexual relations in a particular community,
- Institutional co-operations between enterprises,
- E-mail exchanges between individuals,
- Co-authorship in scientific articles,
- And treaties of commerce between states.

It is argued that social networks have two types of characteristics as structural and contextual. Among the structural characteristics of social networks are size (the number of people within the network), relationship type between the people in the network, the frequency of interaction between the members, homogeneity (the level of approximation between the members), distribution, and the level of correspondence in terms of social networks of their partners. On the other hand, the contextual characteristics are relationship satisfaction, familiarity, reciprocity, and permanence, which would stabilize the ties between the members of a particular social network (Laireiter & Baumann, 1992).

In terms of the content of social networks, Mitchell (1973) defines specifies three types of contents as communication, exchange, and normative. Communication content is related to the knowledge transfer or information flow from an individual to another. An example of this type of content is the spread of rumor within a particular community. Here, the main proposition is that the communication network is determined by the structure of interpersonal relationships. In fact, it is possible to talk about a network designed by a bond of friendship or consisting of professional nodes apart from a network designed by the typical communicative nodes. Therefore, in order for the information to flow without a problem, obstacles resulting from blood ties, social distance or authority should be removed.

For exchange content, it can be argued that individuals are interrelated to one another within a cluster of operations. That is, there are several occasions in which an individual depends on the relation of another one in terms of certain expectations and responsibilities. For instance, in a typical factory, each and every employee is expected to carry out a certain task for the good of another in order for the operational flow of the factory to be continued without an interruption (Mitchell, 1973; Baker, 2006).

Normative content indicates that the communication and exchange contents of social networks should be scrutinized. Thus, there is always a possibility that an individual's expectations and interests may well be conflicting with another. In this case, normative content plays a determinative role to specify the appearance of the relationship between the individuals whose interests are in a conflict. Therefore, the content of the relation should be determined whether it can be understood under communication content or exchange content. The evaluation should be carried out by the observer. These perceptual categories emerges in order to evaluate human behavior under convenient conditions (Mark, Gonzalez, & Harris, 2005, p. 325).

It is possible to categorize social networks considering the number of members, the frequency of interaction between the members, and perceived proximity to the members as (Milardo, 1992):

- Networks of significant others,
- Exchange networks,
- Interactive networks,
- And Global networks.

Networks of significant others, as the smallest unit of social networks, consists of important individuals. People in this network are the ones whose ideas have greater value for the individual. Also, the number of people in networks of significant others is approximately limited to five. The members of these networks are generally family members or close friends. People in these networks has a considerable influence for the lifestyles, behaviors, and self-respect of the individual. Also, the relationships in these networks are unlikely to change in time (Antonucci & Akiyama, 1987, p. 741).

Exchange networks are wider than the networks of significant others. These networks consist of approximately twenty individuals who are friends, neighbors, and colleagues. Members of exchange networks are the ones supporting the individual both financially and psychologically. The members in both exchange networks and networks of significant others are the ones whose opinions are considered important. However, in order for the members in these networks to become significant for the individual, the frequency of interaction should also be high (Milardo, 1992).

Another social network is the interactive networks. In interactive networks, the members are in a constant interaction with one another. Acquaintanceship is the keyword to define the members' relations with each other for these networks. The members in interactive networks are familiar with each other; nonetheless, they are not close compared to networks of significant others and exchange networks (Baron, 2013, p. 141).

The last type of social network is the global network. The global networks cover all the people whom an individual knows or meets. Among the members of global networks are the ones whom an individual shares the same spaces such as a neighborhood or a working place, and the people whose names are familiar. There is a possibility of encounter and interaction with the people in the global networks. The number of members may differ from hundreds to thousands (December, Transitions in Studying Computer-Mediated Communication, 1995, p. 6).

Throughout history, the size and content of social networks have been subject to change due to the increase in travelling, geographical change of spaces, and computer technology. Especially in the modern society and communities, the rise of globalization has played an important role for the considerable changes for social networks. Therefore, people are now part of wider and diversified social networks (Marsiglio & Scanzoni, 1995).

It is seen that both structural and contextual characteristics of social networks may change according to age. Research shows that the social networks tend to get smaller as people get older. Furthermore, as Lang (2000) argues, older people have a tendency to form their social networks with their relatives and family members while minimizing their intimacy with people outside of their family members.

In terms of gender roles, there are differences between the social interactions of males and females, causing a diversification in their social interactions. Generally speaking, it can be argued that the size of the social network may not differ according to gender. However, as Antonucci and Akiyama (1987) claims, women tend to define their social networks with kinship by showing a higher dependence to the members in their networks. On the other hand, men show a tendency to form their social networks with their colleagues (Moore, 1990).

## 2.2.2. SOCIAL NETWORK THEORIES

### 2.2.2.1. Heterophily Theory

It is a known fact that people tend to come together for support and social analogies. It is possible to observe that individuals are generally inclined to form bonds with people who resemble themselves to create clusters in networks. Similarly, it is also possible to see that people may want to break bonds with the ones with weak ties in their network in time. Accordingly, isolated clusters within a particular social network usually do not have any ties (if not have little ties), which would cause fragmentations in the network of an organization. Thus, this type of transformation in the social networks within an organization cause analogous points (similar individuals) to form clusters, which would result in the decrease in the level of relationships between various departments of an organization (Kilduff & Tsai, 2003).

While strength ties may be formed in accordance with affinity in a network, it is also possible to observe actors that form bond according to dissimilarity (i. e. heterophily). The basis of heterophily theory was established by Simmel (1950), in which the notion of “stranger” is discussed. A “stranger” attempts to live in a particular community while trying to keep his/her bonds with a different community. In this case, the stranger has both close and remote ties in the community s/he attempts to live in. People, playing the role of a stranger, use their close ties with the necessary individuals to survive. Their remote ties, on the other hand, are used to form a brokerage relationship among different groups. Therefore, the stranger is the person bringing the inventions, the news, and the intelligence to the close economic communities. The stranger is a mobile individual compared to other people in the groups s/he is involved in; thus, the number of familial ties are low for the stranger (Kilduff & Tsai, 2003; Bartol & Srivastava, 2002; Koutamanis, Vossen, Peter, & Valkenburg, 2013). To conclude, it is possible to argue that heterophily theory deals directly with individuals carrying new information from various sources into an organization.

### 2.2.2.2. Theory of the strength of weak ties

As people tend to come together to form clusters with the ones who feel similar to one another, the formation processes of social structures emerging out of

dissimilar structures should be investigated. In this case, the presence of a forbidden triad in the triads of friendship relations consisting of strength ties can be argued to provide a great insight that there are relations between nodes that seem to have no ties between one an (Granovetter, 1973, p. 1366)

Considering the relationship shown in Figure 2, it can be argued that the ties between A and C, and A and B are strong ties. Therefore, the theory of the strength of weak ties hypothesizes that there is a tie between C and B even if it is an extremely weak one.

Structural characteristics of ties between the nodes are also important in order to have a comprehensive understanding of social networks. Within this scope, it is possible to discuss the structural characteristics under three specific points (Gürsakal, 2009):

- *Direct or indirect ties:* If an individual has direct ties, his/her place is at the center. Therefore, people with direct ties has more control, resulting in a considerably high influential power. Thus, their levels of job satisfaction are higher.
- *Strong or weak ties:* Although it requires more effort and energy to maintain strong ties, it is possible to receive psychological support and information regarding the job with the help of strong ties. However, it may be argued that weak ties may be more beneficial to receive information on finding jobs as close friends with strong ties are limited to the same information cluster.
- *Bidirectional or unidirectional ties*: Bidirectional ties are generally stronger than unidirectional ties as bidirectional ones are mutual ties.

With the help of weak ties, a new knowledge, opinion, or innovation can reach more people. For instance, an individual find a new job, she/he not only moves into a new social network but also creates a new tie with his/her old social network (Granovetter, 1973). Accordingly, innovative information is able to reach beyond the limited number of people in an organization when it is transferred via weak ties (Karadal & Akyazı, 2013). As Granovetter (1973) claims, most people who find a new job generally find it with the recommendation of individuals whom they haven't been in contact for a while. In other words, they find their new job through weak ties. Thus, weak ties of individuals allow them to reach information that they would not

be able to obtain through their strong ties, as they limit the knowledge and the social networks of them.

In terms of the fragmentation and cohesiveness of organizational social networks, it can be argued that weak ties play an important role in connecting the different departments of a business organization. For instance, employees in a particular department tend to have strong ties to their colleagues in their own department. Therefore, they would perceive that the social network in the organization is a cohesive one. Nonetheless, it should be noted that it is rather fragmented without the presence of weak ties. Thus, it can be argued that the weak ties in a business organization facilitates the transformation of the social network from a fragmentation to cohesiveness as they help the formation of interconnectedness of an organization. As it can be seen in Figure 2.2., the weak ties between the departments helps the integration process of the fragmented units of an organization (Kilduff & Tsai, 2003).

(Kilduff & Tsai, 2003, p. 56)

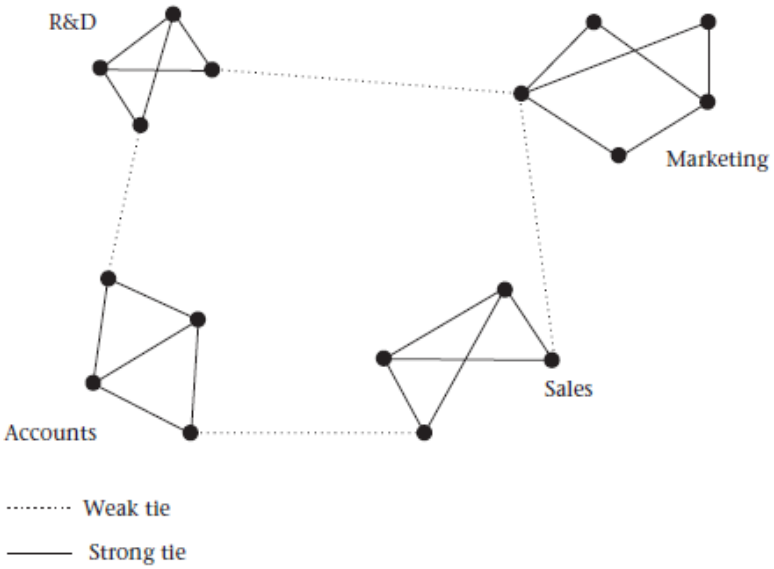


**Figure 2.2.** The Role of Weak Ties in the Formation of Cohesiveness out of Fragmentary Units in an Organization

### 2.2.2.3. Structural holes theory

There is a hybrid structure in the relationships between actors consisting of both strong and weak ties. Therefore, Burt (2009) developed the theory of structured holes highlighting the positions of actors in the social networks rather than focusing on the general characteristics of networks. According to Burt's theory, structural

holes emerge on the condition that there is no direct tie or link between the actors in social network.

Burt (1997) argues that there is a direct distinction between the social capital and human capital. While human capital refers to the idiosyncratic characteristics of individuals, social capital can be explained as the acquisitions obtained through the interaction between individuals. That is, while human capital is directly related to individual's self, social capital is not limited to the individual. Rather, social capital depends on the social communication and exchange between individuals.

It is also argued that the social capital is a complementary element for the human capital. Personal skills that an individual has becomes meaningful according to his/her position in the social structure of an organization. Here, while the personal skills refers to the human capital, the position occupied in the social structure explains the social capital. Therefore, human capital consists of skill. On the other hand, social capital can be argued to be characterized by opportunities. Hence, structural holes theory can be useful in order for the individuals to benefit from the opportunities (Karadal & Akyazı, 2013).

Structural holes are the missing bridges between the cliques or the actors. When there is not a link between two or more social structures or social networks, structural holes emerge, which creates opportunities for individuals to gain the position of brokerage. Burt (1997) argues that structural holes are extremely important in retaining and manipulating information in an organizational network. As strong ties in a social structure traps the actor in a vicious circle, individuals with a strong tie would not be able to retain new information. In this case, what Burt calls as "equivalent ties" should also be mentioned because these people are important in helping the actor to reach the same people. Therefore, with the help of these equivalent ties, individuals are able to contact other people in the network through a number of people. However, equivalent ties also resemble strong ties as they do not help the individual to obtain useful information outside of the social network. The only important source for the actor to obtain supportive and useful information are the structural holes. The main advantage of structural holes is that there are totally different information flows on each side of these holes. If the actor takes an active role as a broker between each side of the structural holes, s/he is able to access those different information flows. Another advantage of the being a mediator between each side of structural holes is that it allows the individual to have the authority of

controlling. The mediator have the right to decide as to what extent s/he would allow another actor in the social network to gain advantage in certain situations (Burt, 1997).

Another important point that should be mentioned regarding structural holes is that actors taking the role of a broker should be identified by other actors in the social networks to be linked through the broker. That is, the person to become the mediator between the social networks should legitimize himself/herself in order not to be overthrown. A stranger without any ties in the networks is not able to fill the structural holes. There is even a possibility of punishment by the other actors in the networks (Burt, 2004).

Structural holes theory of Burt brought about an important enhancement for the social network theories. The main aim of this theory is to explain how the competition operates when different players are in a relationship with one another. Actors with strong ties are able to reach the relevant information quickly. Therefore, they are able to obtain big revenues from their investments and to benefit from opportunities promising big rewards (Gürsakal, 2009).

## 2.3. KNOWLEDGE SHARING

Knowledge sharing in organizations is of key importance as enterprises are required to integrate all the information flowing from each and every department in order to become responsive in today's market characterized by globalization and constant change. Therefore, in this chapter, the main aim is to discuss knowledge sharing, the factors effecting the status of knowledge sharing in an organization, and the obstacles that prevent a healthy environment for effective knowledge sharing (Baron, 2013, p. 153).

### 2.3.1. Definition of Knowledge

So as to have a comprehensive understanding of knowledge sharing, it is useful to discuss the definition of the concept of knowledge. Although knowledge has always been a valuable concept throughout history, it can be argued that it gained a more important place with the rise of globalization in the modern age. That is, while physical strength were regarded as the most important thing in the past, it is now seen that knowledge takes the place of physical strength as a result of the changing management strategies in the highly competitive market.

Although it is possible to encounter various definitions of the concept of knowledge in the literature, knowledge can be defined as the phenomenon or the condition of knowing something through association and experience in its broadest sense. It is also possible to see that knowledge is generally associated with the concept of awareness in the dictionaries (Merriam-Webster, 2017). Furthermore, education is another keyword which can be argued to be related to the concept of knowledge as it provides both theoretical and practical comprehension about certain subjects (Oxford Dictionary, 2017).

Davenport and Prusak (1998) defined knowledge as the amalgamation of conceptual information and values within the framework of experiences. Expert opinions allows the (re)evaluation of experiences as long as they are combined with information. Furthermore, it is argued that knowledge emerges and is processed within the brain of a human being. In terms of organizations, it can be claimed that knowledge lives not only in the documents but also in everyday activities, processes, applications, and norms. As it can be understood from this definition, it would be wrong to presume that knowledge is a plain and simple concept. It consists of the combination of various elements. It also has a certain form, which is characterized by flexibility. Furthermore, as intuition is involved in the process, it would become difficult to understand knowledge within the scope of rationality. Knowledge is inherent in human beings. It is part of an individual's personality, which is rather complex and unpredictable. Therefore, it is possible to depict knowledge as a process and an accumulation of information (Öztürk, 2005).

Knowledge is the precondition for the organizational success in today's global knowledge economy. Furthermore, it is regarded as one of the most important sources for competitive advantage. As Drucker (2012) argues, knowledge has gained a determinative place to shape communities and societies to become unique in the global marketplace. Thus, as it is argued, sharing the knowledge effectively helps organizations and individuals to survive and succeed.

### 2.3.2. Definition of Data and Information

As the concepts of data, information, and knowledge are interrelated, there is a common misconception that these phenomena are used to replace one another. However, it should be noted that there are differences in their meanings. Moreover, it

should also be mentioned that it is necessary to define each of these concepts in order to resolve the confusion. Within this scope, in its broadest sense, it can be stated that data should be structured in accordance with a formulization so as to create information. On the other hand, in order to create knowledge, information should be used with an effective and productive goal (Yılmaz, 2006).

Data can be defined as the storage of certain operations without processing them (Barutçugil, 2002). It can take the form of a text, number, sound recording, or live demonstrations. These are the result of certain observations. It can also be argued that data does not carry a significant meaning on its own. Rather, it can be regarded as a pre-material for the later processes (Mısırdalı, 2010). In order for the data to turn into valuable information, it should be processed through these stages (Barutçugil, 2002):

- *Context:* Understanding the purpose why the data is collected.
- *Classification:* Understanding the units, and main components of the data to be analyzed.
- *Measurement:* Analyzing the data through certain statistical measures.
- *Editing:* Sorting out the errors within the collected data.
- *Consolidation:* Presenting the summary of the data.

Information, on the other hand, can be defined as the organized data. The organization process is carried out by others, and it transfers meaning only for the relevant individual (Barutçugil, 2002). Unlike data, information is meaningful. It has a particular goal, and is relevant to the subject. It is formed for a certain goal. In terms of the benefits of information, it can be argued that information provides insights for a certain subject by giving an important perspective for the individual. Therefore, information is a necessary element for the emergence of knowledge (Güçlü & Sotirofski, 2006).

The stages for the information to turn into knowledge can be specified as follows (Barutçugil, 2002):

- *Comparison:* What does an information related to any condition presents when compared to a certain condition.
- *Results:* What is the destination point an information carries the user in terms of decision-making and actions?

- *Associations:* How can a cluster of information be associated with other clusters of information?
- *Conversation:* What do others think of the information?

### 2.3.3. Types of Knowledge

Although it is possible to find various classifications of knowledge in the literature, the most frequent used classification depends on the sources of knowledge. Therefore, knowledge is classified into explicit and tacit knowledge (Cho, Kim, & Trier, 2005).

#### 2.3.3.1. Explicit knowledge

Hungarian chemist, economist, and philosopher, Michael Polanyi (1998) classifies knowledge as explicit and tacit knowledge. Explicit knowledge is the type of knowledge that can be structured, formalized and transmitted to other people. Among the examples of explicit knowledge are documents, instructions, graphics, and all other knowledge that can be stored and transferred. In organization terms, it can be argued that explicit knowledge can easily be replicated by the competitors of a particular organization as it has already been coded and documented. Therefore, with the use of explicit knowledge, competitive advantage of an organization is limited as its competitive value is lost after some time (Yalçınkaya, 2010).

In today's world, explicit knowledge can easily be created with formal and systematic languages such as computer programs, patents, diagrams, or information technologies. Therefore, it has become easier to express, share, code, transfer explicit knowledge. Furthermore, it is possible to exchange explicit knowledge among organizations. Explicit knowledge is also defined as the objective and rational knowledge type that can be expressed with words, sentences, numbers, and formulas. Therefore, explicit knowledge maintains its validity under all conditions (Rumizen, 2002).

#### 2.3.3.2. Tacit knowledge

In its broadest sense, tacit knowledge is the difference between the expressible truth and the true known facts. Polanyi (1998) justifies the presence of tacit knowledge by stating that "we know more than we express". In another definition, it is possible to describe tacit knowledge as the knowledge that is

conceived through experiences as it includes intuition, emotions, values, and beliefs of an individual. Furthermore, tacit knowledge is the precondition for the formation of explicit knowledge (Güçlü & Sotirofski, 2006). This type of knowledge is unique for the individual; therefore, it is difficult to share tacit knowledge with other people (Taner, Tetik, & Yılmaz, 2010).

Rumizen (2002) defines tacit knowledge as the type of knowledge that cannot be expressed through words, sentences, numbers, or formulas. For Rumizen, tacit knowledge includes perceptive skills such as beliefs and dreams as well as technical skills such as know-how and creativity. Accordingly, a general comparison between explicit knowledge and tacit knowledge can be made, which can be seen on Table 2.2.

**Table.2 2** Comparison between Explicit and Tacit Knowledge

| **Explicit Knowledge (Objective)** | **Tacit Knowledge (Subjective)** |
|---|---|
| Rational | Experiential |
| Real Time | Un-Real Time |
| Digital | Analog |
| Theoretical | Actual |
| Synchronize | Continuous |
| Example: Food listed in a restaurant's menu | Example: Unique recipes and tips for the food listed in a restaurant's menu |

(Tang, 2008, p. 309)

In terms of organizational settings, the important issue regarding the difference of explicit and tacit knowledge is knowledge generation. About this issue, Nonaka and Takeuchi attempted to develop a model for knowledge conversion in organizations, which can be seen on Figure 2.3.

(Nonaka & Takeuchi, 1995, p. 62)

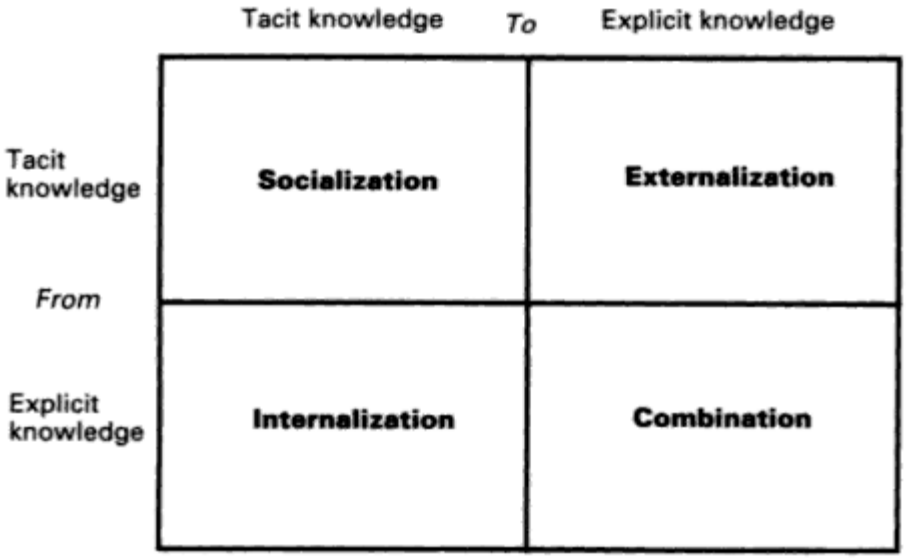


**Figure 2.3.** Modes of Knowledge Conversion to Generate Knowledge in Organizations

As it can be seen in Figure 2.3, four modes of knowledge can be formed as a result of the interaction between explicit and tacit knowledge as socialization, externalization, internalization, and combination. Thus, it is believed to be necessary to explain the transformation of knowledge in each of these modes.

- Socialization:

In this mode, through the interaction between tacit knowledges new tacit knowledge emerges. Socialization can be described as the transfer of tacit knowledge between individuals in an implicit way. The most vivid example of this mode is the relationship between a master and an apprentice. That is, an apprentice can obtain the knowledge by observing and imitating his/her master. Hence, it can be argued that there is not direct exchange of knowledge between a master and an apprentice. Rather, the knowledge transfer is realized by way of observation (Odabaş, 2003).

- Externalization:

In this mode, explicit knowledge is obtained from tacit knowledge. At this stage, tacit knowledge is transformed into models and hypotheses. The knowledge acquired at the externalization stage can be used to develop new products and processes (Kermally, 2005). In this mode, managers are able to make the knowledge that they acquired from key employees accessible by documenting the tacit knowledge. For instance, an organizational department working to document the standard activity procedures is actually attempting to turn tacit knowledge into

explicit knowledge. Accordingly, tacit knowledge is given a certain form that can be stored. By way of storing the knowledge, the risk of knowledge loss is prevented in case key employees quit the job. Another example for the externalization of tacit knowledge is the verbal expression or written documentation of an idea in order to conceptualize it. In other words, externalization is the conceptualization of ideas and dreams (Akgün, Keskin, & Günsel, 2009).

- Combination:

In this mode of knowledge conversion, explicit knowledge is generated from another explicit knowledge. That is, a synthesis of various explicit knowledge in different forms is realized (Kalkan & Keskin, 2005). In other words, any kind of documented knowledge is recorded in another form. For instance, different practices in various departments of an organization are collected and rewritten (Odabaş, 2003). Combination is a process of transforming the personal explicit knowledge into an organizational one. In the combination stage of knowledge generation, explicit knowledge is systematically conceptualized for the total benefit of an organization. One of the best examples to explain combination is the creation of annual budged reports by assembling budget charts of different departments in a business organization (Akgün, Keskin, & Günsel, 2009).

- Internalization:

This mode of knowledge conversion refers to the transformation of explicit knowledge into tacit knowledge. It is closely related to experiential learning, or learning by practice (Kermally, 2005). During internalization, experiences and knowledge acquired through externalization, socialization, and combination are evaluated. That is, conceptual models and technical knowledge becomes turns into a tacit knowledge for individuals (Daud, Rahim, & Alimun, 2008).

### 2.3.4. Definition of Knowledge Sharing

Knowledge is the most important element for value creation. And the value of knowledge can be said to increase as long as it is shared. Therefore, the perspective of “knowledge is the power” is replaced by “knowledge sharing is the power” in the modern business environment (Gurteen, 1999). In the broadest sense, knowledge sharing refers to all the processes and practices for the transfer of valuable knowledge related to organization between the individuals (Bartol & Srivastava,

2002). Today, in order for the enterprises to achieve success, knowledge sharing is regarded as one of the most important factors. In that sense, it is possible to generate competitive advantages for the enterprises as long as the employees share their knowledge with their colleagues. As Matzler and associates (2008) suggests, the success is gained through the knowledge sharing between employees. Furthermore, it is possible to encounter a great number of studies in the literature, which argues that knowledge sharing considerably influences team performance (Sveiby & Simons, 2002). For instance, as Demirel (2006) states, in a study conducted by Toyota, it is seen that there is a direct relation between knowledge sharing and the performance of the company.

Today, it is expected that all the employees (from the top management to the lowest position in the organization) are open to knowledge sharing. Drucker (2012) argues that the top priority for success should be the capacity to manage the intelligence and character of all the employees working at each and every position in an organization so that they are able to constantly create and share knowledge.

In terms of the obstacles preventing the knowledge sharing capacity of employees, there are certain factors. Among these factors is technological factors. Nevertheless, human factors should not be neglected regarding knowledge sharing because behavioral intentions and reactions of employees against control and motivation systems may also acts as important barriers in front of knowledge sharing (Yeniçeri & İnce, 2005; Karadal & Özçınar, 2004).

Knowledge sharing is a system allowing the employees to access the knowledge they need at any time without a problem. It basically refers to the internal fusion of knowledge emerging out of the interactions between employees at individual level. Here, the distinction between knowledge transfer and knowledge sharing should be made. That is, while knowledge transfer refers to the practices emerging during the exchange of knowledge between organizations, knowledge sharing is the fusion of knowledge within an organization (Akgün, Keskin, & Günsel, 2009). On the other hand, it is important for the knowledge to reach the intended destination for knowledge sharing; however, knowledge is merely disseminated in knowledge transfer, and it is not tested whether the knowledge reached the target or not. Lastly, it can be argued that the part that would receive the knowledge should be voluntary for knowledge sharing (Yeniçeri & İnce, 2005).

Knowledge creation is another important subject that should be discussed regarding the importance of knowledge sharing. In that, it is argued that knowledge sharing is an effective instrument for the creation of new knowledge. Moreover, it acts as an important antecedent for organizational commitment for the employees (Augier, Shariq, & Thanning-Vendelo, 2001). Furthermore, because multifaceted communicational channels lie at the center of knowledge sharing, knowledge enhances as long as it is shared.

The success of knowledge management of an organization is directly related to the ability of creating new knowledge and transferring the available knowledge. Accordingly, it would not be wrong to argue that the knowledge stored in the minds of individuals, files, hard disks, and documents have no value if it is not shared. At this point, it can be claimed that knowledge sharing activities take place even at the smallest level when an employee asks his/her colleague about the way some task is done (Akgün, Keskin, & Günsel, 2009).

There is a certain classification of the types of knowledge sharing in organizations as informal and formal. Informal knowledge sharing is realized when people have face-to-face conversations, send IM messages to one another. On the other hand, formal knowledge sharing is realized within the limits of organizational policy. In the organizational policy, the rules of communication, and knowledge sharing are explicitly defined. Therefore, formal knowledge sharing can be controlled more easily compared to informal knowledge sharing (Demirel & Seçkin, 2008).

For an effective knowledge sharing to take place, a suitable organizational environment and organizational culture supporting employees to share their valuable knowledge with one another should be established (Barutçugil, 2002). For instance, even the canteen of the enterprise can be considered as important setting that would enable the employees to have conversations, in which knowledge will be shared among them. When this is the case, even though the subject matter of the employees' conversations is their daily lives, they would turn to occupational matters in the end. With this purpose, a great number of Japanese companies designates conversation rooms as they believe that employees will share their knowledge. In these conversation rooms, it is not expected to find solutions for the biggest problems but this type of initiative can be considered as an effective attempt.

There are various methods to promote and increase knowledge sharing. Among these are knowledge fairs, mentorship, and computer assisted systems. First of all, in knowledge fairs, several consulting companies have the opportunity to promote the knowledge they already have. Secondly, through mentorship, each person is responsible for the education and self-development of another individual in an organization. Last but not least, computer assisted systems are also considered to act as a facilitator for knowledge sharing in organization (Davenport & Prusak, 1998).

Kulaklıoğlu (2009) specifies the important points of knowledge sharing for individuals and organizations as follows:

- Knowledge sharing enables individuals to use the knowledge available at the organizational level.
- Knowledge sharing enables a space for development in learning while preventing the emergence of the same mistakes in the problem-solving processes of similar issues.
- Knowledge sharing secures the good practices as people will share them with one another.
- Knowledge sharing is directly related to job satisfaction and motivation.
- Knowledge sharing increases the rate of interaction within the organization.

### 2.3.5. Factors Affecting Knowledge Sharing

There are great numbers of factors affecting knowledge sharing in organizations. It is possible to specify these factors as factors related to knowledge, organizational factors, and individual factors.

#### 2.3.5.1. Factors related to knowledge

As knowledge is at the center of the knowledge sharing processes, it is no surprise that the features of knowledge are an effective factor for the realization of knowledge sharing. One of the most important knowledge related factor influencing the quality of knowledge sharing is the distinction between tacit and explicit knowledge. As it is mentioned above, the presence of two types of knowledge as explicit and tacit knowledge makes it a complicated element to be shared and generated in organizations. Although the tacit knowledge may pose practical

difficulties, it may allow people to gain individual experiences. However, in the literature, it can be seen that tacit knowledge is a challenging and preventing effect for successful knowledge sharing. On the other hand, explicit knowledge can be more easily shared between people (Kulaklıoğlu, 2009).

Another knowledge related factor is the value of the knowledge. Recently, the commercial and economic value of the knowledge is gradually increasing. Therefore, awareness has already been formed as to what extent knowledge can be valuable. As the awareness increases, the question of what knowledge will be shared with whom at what time becomes an important one for individuals. Considering these circumstances, the competition in the environment becomes more and more fierce as the demand for the possession of knowledge is growing (Akgün, Keskin, & Günsel, 2009). Hence, in organizations in which the knowledge is regarded as an important value, unwillingness to knowledge sharing may emerge as some individuals would not want to share the knowledge they acquired through their own efforts. However, as Kulaklıoğlu (2009) argues, professional employees would be content when they share the valuable knowledge with their colleagues.

#### 2.3.5.2. Organizational factors

Reviewing the literature regarding the effects of organizational factors on knowledge sharing, it is possible to observe several factors such as (Kulaklıoğlu, 2009);

- Organizational culture,
- Organizational structure,
- Organizational conditions,
- Organizational trust,
- Managerial trust,
- Human resources practices,
- Reward system,
- Organizational processes,
- Time limitations,
- Communicational channels,
- Organizational trust,
- Organizational commitment,

- Technological infrastructure of an organization.

Here, within the scope of this study, five of these factors will be discussed as they are closely related to interpersonal communication and computer-assisted communication.

**a. Organizational culture**

Organizational culture can be defined as the type of culture shaped by the organizational practices related with the environment of the organization. In another definition, it is possible to describe organizational culture as the relatively fixed beliefs, manners, and values that are commonly shared in an organization. It consists of a series of symbols, rituals, and myths. All these components transfers the beliefs and values of the organization to the employees (Erdem, 2007).

In organizations, appropriate conditions for teamwork, clear definition of common goals, and shared vision positively influence the knowledge sharing activities. Organizational culture formed in accordance with the way an organization chooses to work is a necessity for the formation of good relations among employees in the workplace. Also, through a well-established organizational culture, an effective social interaction between the employees can be observed in terms of technical knowledge sharing between various departments as employees will most probably tend to share their skills, experiences, and intelligence with their colleagues (Top & Dilek, 2013).

The effects of organizational culture on social interaction that would impact the effectiveness of knowledge sharing can be evaluated on three dimensions as horizontal interaction, vertical interaction, and special attitudes supporting knowledge sharing. Among these, vertical interactions are practices that enable the managers of an organization accessible to all members in order to establish an effective knowledge sharing environment. Furthermore, it can be argued that culture can also organize the level of interaction between the members with the same status. Therefore, it has also an important effect on the horizontal interaction within the organization. Special attitudes, on the other hand, provides sharing and learning within the organization by shaping the social interaction environment (Sarıkaya, 2010).

**b. Technological infrastructure**

Today, technology is considered as the most important strength in terms reaching and obtaining knowledge (Barutçugil, 2002). Within this scope, the most important role of technology regarding knowledge sharing is to spread the opportunities of reaching knowledge to a wide scope of people, and to provide the necessary means to rapidly and constantly transfer knowledge. Therefore, technological infrastructure within a business organization provides the basis for the formation of unstructured knowledge of individuals or groups so that it will be beneficial for all the members. By doing this, technological infrastructure utilizes information technology.

In order to gain an advantageous position in the competitive environment, organizations should implement certain technical applications such as conceptual maps, knowledge maps, target-oriented databases, decision support systems, and data mining within their knowledge network. Furthermore, as technology is increasing with the effective use of modern information systems such as internet, extranet, internet, software filters, smart elements, and data warehouses, it is easier to systematize, enhance, and accelerate knowledge sharing in organizations. Thus, it is possible to suggest that organizations should adapt these technological elements so as to respond to their requirements during everyday job activities (Altındiş & Ağca, 2011).

Reviewing the literature, it can be seen that computer systems, internet, e-mails, instant messaging applications, video conferences, and intranet networks are believed to be positively influence the knowledge sharing within organizations. With the help of these elements, businesses are able to share the knowledge between various departments in a rapid, secure, and controllable way (Kim & Lee, 2006; Pan & Leidner, 2003; Ruppel & Harrington, 2001). However, as technological systems tend to breakdown and are characterized by vulnerability to attacks, poor maintenance of technological infrastructure may have negative effects on the knowledge sharing capabilities of organizations and individuals (Kulaklıoğlu, 2009).

**c. Reward systems**

Organizations generally attempt to implement reward systems in order to enhance knowledge sharing. That is, rewarding is one of the most effective methods

for open knowledge sharing. It is generally used as a performance measurement tool so as to increase the quality of knowledge sharing between employees (Özler, Özler, & Gümüştekin, 2006).

To promote knowledge sharing, enterprises are required to determine the challenges that may occur during the process of monitoring and measuring the knowledge sharing behaviors of employees. Following the determination of problematic issues in the measurement, an effective rewarding system can be developed. Furthermore, managers may hold ordinary or impromptu meetings to benefit from the perspectives of employees. After a certain period, employees whose suggestions have been useful may be awarded. However, the important issue that should be taken into consideration is the probable emergence of unwillingness to share individual knowledge with colleagues as employees may not want to share their knowledge so as not to share the reward. In this case, it is believed that a rewarding system based on collective performance may hinder the problem of unwillingness to share individual knowledge. If group performance is taken as the determinative criteria for the rewarding, knowledge sharing between the group members may be promoted. However, this might bring about the problem of free-riders. Thus, if free-riders are penalized within the group, individual contribution for the team-work is praised, and mutual commitment is achieved within the group, knowledge sharing may increase between the members of the group. Furthermore, regarding the utilization of rewarding systems for knowledge sharing, perceived fairness should also be mentioned as it will lead the individuals to share their knowledge believing that they will be fairly rewarded (Townsend, DeMarie, & Hendrickson, 1998).

**d. Organizational communication**

In the literature, it can be seen that organizational communication is also regarded as one of the factors affecting knowledge sharing (Asteroff, 1987). Communication, in the broadest sense, can be defined as the exchange of knowledge and opinions between the participants of a conversation. In order for an effective communication to be carried out, Barutçugil (2002) suggests that individuals should take the following methods and suggestions into consideration:

- Feedback: The presence of feedback acts as an important element in the communication cycle as it shows whether the knowledge to be shared between the participants is understood.
- Sensitiveness to the worldview of the receiver: For a successful and effective knowledge sharing, participants in the communicative activity should know the inner world of the person who is expected to receive the knowledge.
- Simple and direct transfer of knowledge: The person to transfer the knowledge should use the appropriate language that the receiver is capable of understanding both in written and verbal communication activities.
- Effective listening: The knowledge to be transferred should only be acquired by listening the sender carefully. For instance, taking notes of important points may increase the effectiveness of knowledge sharing.
- Supportive behaviors: Actors in a communication activity should put extra efforts to align their behavior with the content of the conversation.
- Richness of discourse: Various expressions, idioms, and repetitions may be used to enrich the quality of communication, which would lead to successful knowledge sharing.

**e. Employee relations**

Relations of colleagues with one another can also be regarded as an important antecedent of successful knowledge sharing. That is, knowledge sharing processes can become smoother if there are positive social interactions, reciprocity, and a sharing culture within the organization. This not only enhances the knowledge sharing at the individual level but also allows technical knowledge to be shared among the members of an organization (Top & Dilek, 2013).

Managers can facilitate the development of humane relationships within the business organization to increase the effect of knowledge sharing. As individuals in a group tend to ask for advices and share their knowledge with one another as long as they know each other, managers should find ways to facilitate relationship development among the employees. However, social interactions are not merely useful for a business organization because job-related knowledge is the intended target to reach. Comparisons within the organization, helping the colleagues, visit to the workplaces, technology fairs, and problem solving meetings can act as the

facilitative acts for strong relationship building for the employees. Therefore, they would tend to share their knowledge to advance that of their colleagues. Furthermore, managers should allow some time and support the employees to understand and implement the knowledge they acquired through their relationships (Öztekin, 2008).

#### 2.3.5.3. Individual factors

The last factor that should be discussed regarding the antecedents of knowledge sharing is the factors related to individuals. Reviewing the literature, it is possible to find various person-related factors that are believed to be influential over knowledge sharing in organizations. However, the most frequently studied ones are personality traits and the impact of individual motivation (Karaaslan, Özler, & Kulaklıoğlu, 2009).

##### a. Personality traits

As knowledge can only gain its meaning within the mind of individuals, personality traits should be studied as they acts as important determinants for the perception of certain knowledge by individuals. Furthermore, it is also known that personality traits may shape the communicative attitudes of people, which would most probably impact the quality of knowledge sharing. In terms of definite personality traits regarding knowledge sharing, five characteristics are defined (Costa & McCrae, 1992):

- Agreeableness: It is a personality trait shaped by environmental conditions. If the agreeableness level of an individual is high, they tend to be merciful, creative, cheerful, and respectful and open to collaboration. Therefore, they are more likely to prefer cooperation rather than competition as they are eager to help others. As knowledge sharing can be regarded as a collaborative process within the workplace, altruism of these agreeable individuals can be argued to positively influence knowledge sharing.
- Conscientiousness: Conscientious individuals are generally trustworthy people. They generally prefer taking responsibilities as well as working in an organized way. Thus, they are hardworking and successful in their jobs. In the literature, it is possible to see that conscientiousness increases organizational

commitment. Hence, as organizational commitment is one of the antecedents of effective knowledge sharing, it would not be wrong to infer that conscientiousness is an important personality trait for a successful knowledge sharing.

- Neuroticism: This type of personality refers to the tendency of individuals to feel negative emotions such as anxiety, vulnerability, anger, and depression. Neuroticism also refers to emotional instability. Therefore, as a result of the instability in their psychological well-being, neurotic people are prone to stress. Accordingly, it can be argued that neuroticism as a personality trait would negatively impact knowledge sharing as neurotic people would not want to share their knowledge and prefer to work alone.
- Extraversion: Sub-dimensions of extraversion consists of warmth, assertiveness, excitement-seeking, positive emotions, and gregariousness. Thus, extrovert people are more likely to be energetic in the workplace. As they are talkative, it can be expected that extroverts will tend to share knowledge with other members in the organization.
- Openness to Experience: This type of personality traits brings about an active imagination, aesthetic sensitivity, intellectual curiosity, originality and an unbiased approach. People with a high level of openness to experience generally show a tendency to share knowledge as they always seek new knowledge.

**b. Motivation**

Facilitating the knowledge sharing process can be evaluated as a motivational issue. Motivation may change according to culture, organizational structure, and social perspectives. As extrinsic motivation is generally related to organizational dimensions such as reward systems, several practices to increase employees' motivation can be seen. Among these practices are reward systems, premium pays that would invoke organizational trust in the employees. Therefore, as motivation increases employees tend to show voluntary actions in their tasks (Şahin, 2009).

In terms of knowledge sharing, the effects of motivation can be classified as extrinsic and intrinsic factors. When employees' needs are directly met or achieve the goals they defined on their own, intrinsic motivation can be argued to emerge. Furthermore, trust is also another impulse that should be taken into consideration regarding intrinsic motivation. Moreover, it can be claimed that intrinsic motivation

emerges when an activity is perceived as valuable by the employees and these values can be sustainable for themselves. On the other hand, extrinsic motivation refers to the important impulses driving the individuals to share knowledge. To exemplify these impulses, supervisory control, orientation and promotion of knowledge generation, and organizational support mechanisms can be mentioned. So as to boost the moods of employees, which would lead to sustainable knowledge sharing to increase the profitability of enterprises, companies should not only invest in their technological infrastructure but also in their human capital (Top & Dilek, 2013).

### 2.3.5.4. Barriers to knowledge sharing

Reviewing the literature, it is possible to see different classifications of barriers to knowledge sharing. For instance, Davenport and Prusak (1998) attempted to define barriers to knowledge sharing in terms of a cultural perspective. These cultural problems that inhibit knowledge sharing (called as "frictions") and possible solutions can be seen on Table 2.3.

**Table.2 3** Cultural Frictions Knowledge Sharing and Possible Solutions

| Frictions | Possible Solutions |
|---|---|
| Lack of trust | Relationships can be developed by face-to-face communication, which would create an environment of trust |
| Different languages, cultures and frames of references | A common ground can be established by way of trainings, discussions, teamwork, and job rotations. |
| Lack of time and a place for interpersonal communication; and a narrow idea for productive working | Necessary time and place can be allotted for knowledge transfer such as knowledge fairs, conversation rooms, and conference reports. |
| Employees that keep knowledge for themselves are rewarded | Knowledge sharing can be made the priority criteria for rewarding and performance evaluation. |
| Insufficiency of the receivers to absorb new knowledge | Training programs for flexibility can be developed. People with openness to new opinions can be hired at the first place. |
| A belief that knowledge is merely for a privileged few people. | A nonhierarchical approach can be embraced regarding knowledge. The quality of knowledge should be emphasized rather than the source. |
| Intolerance against errors or needs for help | Creative errors and collaborations can be approved and rewarded. |

(Davenport & Prusak, 1998, p. 97)

Apart from the cultural perspective of Davenport and Prusak (1998) to the barriers to knowledge sharing, Riege (2005) defines 30 knowledge sharing barriers and classifies them under three main dimensions as individual, organizational, and technological. Among these, individual level barriers consists of elements such as lack of communication, cultural differences, fear of losing status, and lack of time.

Secondly, organizational barriers generally refers to the environmental conditions, access to formal and informal meeting places, poor infrastructure. Lastly, technological barriers includes elements such as the problems in the integration of technological based systems. An overall list of these barriers can be seen on Table 2.4.

**Table.2 4** Individual, Organizational, and Technological Barriers to Knowledge Sharing

| Individual Barriers | Organizational Barriers | Technological Barriers |
|---|---|---|
| Lack of time for knowledge sharing | Vagueness of the organizational targets, strategic approach, and the implementation of knowledge management strategy | Poor implementation of IT systems that would hinder the way employees do their jobs |
| Employees' fear of risking their jobs | Lack of managerial principles that would clearly transmit the benefits and value of knowledge sharing practices | Lack of internal and external technical support that would enable knowledge sharing |
| Employees' tendency to believe that the knowledge is not valuable for their colleagues | Limitation in the informal and formal environment for the sharing and generating new knowledge | Illiteracy of employees regarding the use of technological opportunities for knowledge sharing |
| Dominance in the sharing of experiences | Insufficiency of reward systems that would promote knowledge sharing within the organization | Lack of alignment between different information technologies and processes |
| The use of hierarchy, status, and formal power | Insufficient support for knowledge sharing from the organizational culture | Lack of harmony between the needs of individuals and the integrated information technologies |
| Intolerance towards past mistakes | Lack of initiatives to promote knowledge sharing for skilled and experienced employees | Lack of familiarity with IT systems causing unwillingness to use these systems |
| Differences in the level of experiences | Poor infrastructure to support knowledge sharing | Lack of training regarding the use of new IT systems |
| Lack of time and interaction between the sources and receivers of knowledge | Shortage of organizational sources to support knowledge sharing | Lack of demonstration regarding the advantages of the new system over the existing one |
| Poor verbal or written communication of job-related skills | Fierce competition in the working environment | |
| Differences in age | Restriction of communication and knowledge flows with certain rules | |
| Differences in gender | Poor design of working environments and working places | |
| Lack of social networks | Fierce inter-organizational competition | |
| Differences in educational levels | Hierarchical structure in the organization | |
| Employees' tendency to hide their intellectual characteristics as they fear from not receiving recognition from their colleagues | Departments of extremely big size | |
| Lack of trust regarding the misuse of knowledge | | |
| Lack of trust regarding the credibility of the source of knowledge | | |
| Differences in the culture, beliefs, and values of individuals | | |

(Riege, 2005)

## 2.4. TEAM AND TEAM PERFORMANCE

### 2.4.1. Definition of the Concept of Team

In the broadest sense, team can be defined as the group of people that are working together to reach a common goal (Dengiz, 2000). In today's competitive marketplace, teams are acting as facilitators to produce high quality products and services, develop new products or new ways to produce particular products, and to reduce costs for the organizations (Alper, Tjosvold, & Law, 2000).

Teams should be created in accordance with the idea to canalize the skills, power, and energy of each and every member to a common target. That is, a well-formed team can be argued to increase the individual performance of the members as well as allowing people to work together. Furthermore, as Dengiz (2000) states, while team is a group of people, it would be wrong to assume that any kind of group of people would be a team.

Kendiroğlu (2000) specifies the common characteristics of teams as follows:

- To form a team, at least two people is needed.
- Members of a team come together in order to realize a predetermined goal or to reach a definite target.
- Each member in a group has certain skill of his/her own. The members utilize their skills in an integrative way so as to reach the team's target.
- Generally, participative leadership is dominant within successful teams.
- Members of a team are given the right to speak during decision-making processes.
- The environment of a team is characterized by mutual trust.
- Members of a team feel responsible for one another.
- Collective working and collective performance measurement is a must for a successful team.

On the other hand, Katzenbach and Smith (2015) defines the qualifications that should be present in teams as such:

- Limited number: As the number of members in a team increases, constructive dialogue becomes harder. Furthermore, it would be more difficult to designate suitable places and appropriate time for a large number of people to come together. Therefore, teams consisting of large numbers of people should be divided so as to become functional.

- Complementary skills: In order for a team to be successful, each members' skill should support and complement one another's. Moreover, it should also be noted that individuals with a potential skill should be given the necessary encouragement to develop their skills. Hence, it can be argued that teams should be designed in a way for each member to demonstrate his/her own skills and to develop them.
- Dedication to a common goal: A collective and a meaningful goal support the definition processes of desires and qualifications in a team. Common goals help teams to develop their own identities, which would prevent certain conflicts. Predetermined performance goals acts as catalyzers for the team to focus on specific points when attempting to reach their destination.
- Dedication to a common approach: Teams should develop a common approach regarding their methods of reaching the predetermined goals.
- Mutual responsibility: In order for teams to shape their goals and approaches, members should feel responsible for one another.

Lastly, Margerison (2001) mentions these specific points in terms of the competencies of teams in general:

- Advising: Directly related to knowledge sharing.
- Innovating: Forming new ideas and testing them.
- Promoting: Discovering new opportunities.
- Developing: Determining new approaches and testing them.
- Organizing: Designating how the operations are carried out.
- Producing: Creating outcomes and presenting them.
- Inspecting: Controlling the operative systems.
- Maintaining: Ensuring that operations are carried out according to certain standards.
- Linking: Providing harmony and integration.

### 2.4.2. Conceptual Differences between Groups and Teams

As there is a misconception regarding the use of group and team to substitute one another, the conceptual differences between the two should be made clear. As Stewart and associates argues, probably the easiest example to demonstrate the

conceptual differences between group and team is to give the example of a sports club. That is, talking of sports clubs, “sports group” has never been used as an expression to define a sports team.

Groups can be defined as the working units, in which the members are linked to one another to a certain extent. Members are able to perform different or same roles but their work is interconnected to one another. The need for collaboration in groups is at the lowest level. On the other hand, team can be defined as the small working unit, in which the members share common goals, complementary skills, and interdependent roles. However, the most important difference between a group and a team is that the latter is characterized by collaboration (Baker, 2006).

The conceptual differences between groups and teams can also be discussed in terms of performance measurement. The performance of a work group is represented by the individual duty of each of its members. On the other hand, the performance of a team includes both individual outcomes and joint productions. A joint production includes the interviews, surveys, and experiments that should be carried out by two or more people. Also, any kind of joint production should include the actual contributions of team members. Furthermore, a work group attempts to generate individuals that are trying to form common goals and struggling to create effectiveness in order to be successful in reaching those goals. When the work group is able to determine the common goals and to develop effective methods to realize their aims, they can be regarded as a team (Wheelan, 2016).

Work groups are both popular and effective structures in big-scale organizations, in which individual responsibilities are considerably important. The best work groups focus on individual goals and responsibilities although they share knowledge, perspectives, and opinions in order to increase the standard of individual performance and to make their members help one another in decision-making processes. Members in a work group do not take responsibility for the outcomes of others. Also, they do not strive to increase performance working with another member. The basic difference between teams and groups is that teams require both independent and mutual accountability. Furthermore, teams are based on interactions, discussions, and knowledge sharing within the group. The main differences between work groups and teams can be seen on Table 5 (Katzenbach & Smith, 2005)

**Table.2 5** Main Differences between Groups and Teams

| Work Group | Team |
|---|---|
| There is a strong and focused leader. | The leadership is shared within the team. |
| There is individual accountability. | There is mutual accountability in addition to individual accountability. |
| The main goal of the group is aligned with the organizational mission. | The main goal is determined by the members of the team. |
| Work products are individual. | Joint productions are important as indicators of collective work. |
| Performance measurement is carried out indirectly by evaluating the influence on other groups, individuals, or departments. | Performance is measured directly by evaluating the collective products. |
| There are efficient meetings. | Open-ended discussions and active problem-solving meetings are common. |
| The members of the groups discuss, decide, and delegate. | The members of the team discuss, decide, and collectively perform the work. |

(Katzenbach & Smith, 2005)

### 2.4.3. Types of Teams

It is important to establish the most suitable type of team in order to benefit from teamwork in reaching the common goal. Reviewing the literature, it is possible to encounter a great amount of research showing a direct relation between team performance and the types of teams. That is, there is a direct link between a successful team and the type of team chosen for a particular task. In the literature regarding team performance and teamwork, it can be seen that teams are generally classified in terms of their structure, aims, methods of selecting members, fields of activity, and degree of authorization (Clark, 1994). However, the most comprehensive classification of teams is seen in the study of Cohen and Bailey (1997), in which they classifies teams as “work teams”, “parallel teams”, “project teams”, and “management teams”. Further, Bell and Kozlowski (2002) mentioned “virtual teams”, which shaped the debate regarding the types of teams.

#### 2.4.3.1. Work teams

Work teams can be defined as the group of people interdependently sharing their responsibilities in order to achieve outcomes unique to their organizations (Sundstrom, De Meuse, & Futrell, 1990). These teams work as departments

responsible for particular products and services of a business organization. Regarding the members of these teams, it can be argued that they are usually consistent in their full-time work, which is clearly defined by the organization. And as Mohrman and associates (1995) suggests, work teams are traditionally managed by auditors who are in charge of deciding what is to be done, how it should be done, and who will do it.

Additionally, it can be seen that there are alternatives of work teams, which have recently been called as favored, strong, semi-autonomous, autonomous, independent, and self-directed teams. Among these, self-directed teams generally develop auditors or managers who can do the decision-making within the team. Also, the members of these teams usually learn their skills by cross training within the team. These teams are formed by organizations to enhance quality, to increase productivity, and to reduce costs. Furthermore, it can be seen that most of the organizations tend to form work teams in order to facilitate the process of renovation within the organization to adapt to the changing conditions in the business environment (Cohen & Bailey, 1997; Tata & Prasad, 2004).

In some cases, self-directed teams are called as autonomous or semi-autonomous work teams. In that case, it should be noted that an autonomous team cannot be formed with an official leader. That is, the team can elect their own leader or the role of leadership may be delegated to a member of the team. Also, participative leadership can be seen as each member is accountable for the conduction of a certain task. On the other hand, semi-autonomous work teams are managed by an official leader. However, the leader has an indirect way of managing the team. That is, in semi-autonomous work teams, the role of the leader may be annihilated if the team is able to operate without an official auditing (Shonk, 1997).

The common characteristics of self-directed work teams are specified as follows (Wellins, 1990):

- The members of the team conduct managing, planning, organizing, leadership, and auditing.
- They decide who will do a certain task at the suitable time. They are even able to decide to hire new personnel.
- They plan according to priorities and goals; hence, they are able to determine the beginning, the end, and the pace of the task.

- They are accountable for inventory and quality control in all the stages of production by collaborating with other departments and teams in the organization.
- They develop solutions to the problem and implement them.
- They take responsibility in the operation of the team.
- They are also able to decide whether a training program is needed or not.

#### 2.4.3.2. Parallel teams

Parallel teams are formed with people coming from different job units with different skills in order to operate a certain task. They are formed in parallel with the official organizational structure. Their authority is usually limited as they give advices in order to increase the organizational hierarchy. These types of teams are also called as problem-solving teams or progress-oriented teams (Steel, Jennings, & Lindsey, 1990).

Parallel teams are usually formed for temporarily to solve specific organizational problems or promote progress within the organization. These teams' scopes of responsibility include quality, process advancement, restructuring, and organizational development. In terms of their members, it is seen that production and service workers, professionals, and managers can be a part of these teams. Therefore, the departments and the hierarchical positions of the members may significantly differ. In parallel teams, members of the team are not equipped with the expertise of other members. Thus, they may experience communicative problems as their professional language and experiences are different (Fiore & Schooler, 2004).

The main aim of parallel teams is to provide solutions by predicting possible problems before they emerge. Accordingly, the best way to solve a problem is to define it. In that sense, the most important problem of teams is to provide solutions without fully comprehending and defining the problem. Therefore, it can be argued that the first stage of problem-solving is to discuss the problem until each and every member acknowledges it as a natural outcome. In the following stages, the suggested solutions can be implemented and feedback will be gather from the members. In the last stage, the solutions are evaluated and discussed (Pokras, 1995).

#### 2.4.3.3. Project teams

Project teams are usually formed with individuals at the same hierarchical position from different departments to realize a particular task or a project. These teams are also temporarily come together and return back to their positions after the project ends. Project teams produce one-time outcomes for a new facility, a new product or a service to be presented to the public (Wellins, 1990).

The nature of project teams is characterized by the idea to develop practices of knowledge, decision, and expertise. Also, these teams attempt to avoid repetition and imitation. Team performance of project teams can increase when they develop an existing situation or express absolutely new perspectives regarding the organizational structure. The members of project teams are selected from different departments or functional units in order that they are able to implement their own unique skills in the project. As it is already argued, although the members tend to return back to their own departments, there is always a possibility that they will be selected for another project team with a promotion if their role in the previous project team is seen valuable by the organization (Brown & Eisenhardt, 1995).

#### 2.4.3.4. Management teams

Management teams coordinate and manage the departments that are in the scope of their authority. Furthermore, they provide integration with other departments during the main business processes (Mohrman, Cohen, & Mohrman, 1995). These teams are accountable for all the performances. The hierarchical ranking between the members is the result of authority. During the formation process of management teams, managers from research, development, production, marketing, and quality are selected. A board of directors is formed, which is responsible for the strategic management and performance of the organization. Also, top management teams may use a wide range of authority when business environment gets ambiguous. Last but not least, these teams help enterprises to gain competitive advantage by way of integration different efforts, sharing responsibilities for the success of the organization, and collective expertise practices.

#### 2.4.3.5. Virtual teams

As business environment, characterized by globalization and cooperation, increased competition, companies began to shift their focus from production to

service and knowledge. Furthermore, the rapid changes in the communication and information technologies directed the organizations to become more adaptive and flexible in order to survive in the business environment. As a result, virtual teams have been the issue of discussion as early as 90s. Accordingly, virtual teams can be defined as the group of people living in different geographical locations, which are come together with the help of information and telecommunication technologies, including internet, e-mails, and instant messaging services (Townsend, DeMarie, & Hendrickson, 1998).

The distinctive characteristic of virtual teams is the locational distance and the use of information technology. Virtual teams accompany the traditional activities normally performed by other teams in organization. For instance, those virtual teams can be utilized via e-mails, instant messaging, video conferences, cloud information processing, and online databases. These teams provide a great number of online instruments for brainstorming, evaluating and sorting the alternatives, voting different opinions, and providing decisions for traditional tasks. In terms of the advantages of virtual teams, it can be argued that they allow organizations to reach highly skilled individuals regardless of their locations. These highly skilled members enable the organization to rapidly respond to the fierce competition by working from their homes. Therefore, virtual teams provide more flexibility compared to teams located within the facility of a business organization (Bell & Kozlowski, 2002).

Other advantages of virtual teams can be specified as follows (Clark, 1994):

- Members of virtual teams can direct their expenses to their other needs by reducing their expenses for time, accommodation, and transportation.
- It is not necessary to keep all the members at a certain location, they can conduct meetings regardless of their locations.
- Virtual teams can pay high wages so as to keep employees showing high performance in the company.
- Employees have the opportunity to sustain their business life and private life in harmony.
- As the members of virtual teams are dynamic, they can easily switch from a project to a new one.
- Team members can work with other teams at the same time.

- With the help of rapid communication, the needs of the global market can be easily met.

However, it should also be noted that there is some negative criticism regarding the disadvantages of virtual teams. For instance, it is believed that virtual teams may damage synergy and team spirit as they reduce social communication. That is, it is argued that physical intimacy, informal communication, emotional sharing is important for the organizational socialization process of team members (Lipnak & Stamps, 1997). Nevertheless, those disadvantages can also be seen as advantages as it is seen that instant messaging may help people to progress their informal communication with one another.

### 2.4.4. Teamwork and Team Performance

Teamwork can be defined as the process of collaboration and cooperation of individuals to reach common goals and targets by using their knowledge and skills. The process of teamwork differs from other processes as it provides extraordinary outcomes. That is, individuals are able to achieve results with teamwork otherwise they would not be able to accomplish on their own. Therefore, teamwork allows people to reach the zenith of their potentials (Yapar, 2009).

Teamwork means gathering individuals with a team spirit in an attempt to achieve both individual and organizational goals. Developments in the business environment can be argued to necessitate the establishment of teams within organizations and the implementation of teamwork. Globalization in the market, development and popularization of new technologies, changes in the demographic characteristics of labor, the presence of cheap labor in developing or under-developed countries, and the rapidly changing consumers demands can be specified as the causes for the change in the way organizations operate (Çetin, 2001). Accordingly, it can be seen that organizations began to put emphasis on teamwork apart from individual tasks.

Teamwork includes differentiation between the members and their integration in one working unit with their different skills. That is, different personality traits, knowledge, skills, and experience among team members are absolutely natural. In fact, without these differences, it would be impossible for the team to achieve their

goals. Therefore, a successful teamwork can be argued to require the integration of different skills and approaches so that all the members will act as if they are united for a common cause. Thus, it can be claimed that the paradox of teamwork is the conflict between differentiation and integration, which may cause problems within the team that would decrease the performance (Donnellon, 1996).

As organizations switch from classic management approaches to modern ones, their attitudes towards and expectations from their employees have changed. That is, organizations used to expect their employees to do what they are told to do in classic management approaches. On the other hand, with the adoption of modern approaches, employees are expected to develop ideas, to provide solutions, to participate in decision-making processes, and to take responsibility of the instruments they use to perform their business-related tasks. Further, employees are also supposed to be accountable for the entire department which they are part of. With these purposes, organizations emphasize teamwork as it develops employees' commitment and responsibilities, which lead to organizational citizenship behavior (Çetin, 2008).

Teams perform better than work groups in situations that require the fusion of multifaceted skills, experiences, and decisions as the roles and responsibilities of team members are well defined. Furthermore, it should also be noted that teams are more flexible compared to organizational groups as the number of members is limited in teams. Also, teams are more productive compared to groups without performance goals. Namely, members of team dedicate themselves for the concrete performance goals. In other words, it can easily be argued that there is a conceptual interdependence between teams and performance (Katzenbach & Smith, 2015).

Teams constitute one of the main elements of organization performance with their flexible structure. In today's organizations, it has become an important requirement to put emphasis on teamwork in order to motivate individuals, facilitate knowledge sharing, and increase performance (Küçük, 2008). Also, teamwork is an important concept to develop lateral communication within the organization. Within this scope, it should be mentioned that an organization is supposed to constantly support communication and coordination in order to become functional. At this point, teamwork is regarded as one of the most important instruments.

As Katzenbach and Smith (2015) claims, there are mainly four reasons why teamwork is required for organizations. First of all, teams are able to assemble

superior skills and experiences of various individuals. Therefore, combination of skills, competencies, experience, and especially knowledge considerably helps organizations. Secondly, it is argued that teams and team members can communicate with one another in a way that will support authority and real time solutions provided that there are clear targets. Thirdly, teams demonstrate a unique social dimension that supports the financial and administrative aspects of organizations. And lastly, teams can increase loyalty and motivation of employees by turning the activities into entertaining tasks.

### 2.4.5. Measurement of Team Performance

It is already argued that there is a direct relationship between teamwork and team performance. Within this scope, it should also be noted that measurement of team performance is one of the most important systems in terms of the administrative dimensions of an organization (Kılınç & Akkavuk, 2001). In that sense, Rolstadas (2012) suggest that there are several factors that should be taken into consideration in the processes of measurement of team performance including activity, profitability, and quality.

As merely measuring individual performance is likely to damage team spirit and to cause unwillingness to participate in teamwork, both individual and team performance should be measured in order to help individuals align their performance goal with the organizational mission. Measurement of team performance is generally performed with traditional methods of performance measurement methods accompanied by the individual performance measurement conducted by managers. While measuring team performance, it is necessary to clearly express individual, team, and organizational goals. Also, performance standards and criteria of measurement should also be defined. Furthermore, feedback is also an important part of performance measurement of teams. However, it should also be noted that the process of performance measurement should follow a systematic approach. With this purpose, it is seen that team based performance evaluation systems are used that simultaneously focus on both individual and team performance. Therefore, it can easily be suggested that the system to measure team performance should consist of two elements as individual performance and team performance because two concepts

operate interdependently, which directly determines organizational performance (Kaba, 2009).

Reviewing the literature regarding the measurement of team performance, it can be observed that there are a number of performance evaluation models as there are different types of teams, which is already discussed above. Nevertheless, as Zigon (1997) suggests, performance evaluation model should include these points:

- Determination of performance standards and measurement models for each successful outcome put forward by the team.
- Definition of individual outcomes of team members.
- Clear definition of the importance and qualities between team outcomes and individual outcomes.
- Planning regarding how performance data is collected and interpreted.
- Comparison between team performance and individual performance based on the already determined standards.

### 2.4.6. Factors Contributing to Team Performance

Reviewing the literature, it is possible to find various factors that would increase team performance. Among these are participation and trust, innovation, vision, collaboration and harmony, participative leadership, clearly defined goals, communication, risk taking, self-criticism, and quality enhancement can be mentioned (Chen & Kanfer, 2006). Here, within the scope of this thesis innovation and communication will be discussed.

#### 2.4.6.1. Innovation

Innovation refers to the promoting, supporting, and acknowledging attempts to introduce new and advanced way of doing tasks within the team. As Henry (1998) asserts, taking responsibilities and showing efforts regarding innovation will bring about important decisions and effective outcomes.

It is argued that innovation may differ in both informal and formal dimensions. For instance, West (1990) states that oral support is formed by implication, individual data, annual activity reports or word-of-mouth. Furthermore, official support for innovative behaviors is a necessary condition for the innovativeness of the team although it is against oral support. For instance,

Schroeder and associates (1989) emphasizes the importance of support from the elite power in order to implement innovation. Also, Daft (1978) argues that accessible resources should be provided to develop innovation.

#### 2.4.6.2. Communication

Communication within a team can develop provided that the knowledge sharing takes places within the organization as knowledge and skills of individual is subject to change over time. Also, it encompasses all the interactions regarding power, attitude and values (Loxley, 1997). As Husting (1996) argues, it is possible to create reliable communication processes in teams by clearly defining responsibilities.

Team members need cooperation to develop one another's knowledge by listening to each other in communicative activities. Additional decisions and both formal and informal exchanges also act as communicative practices within the team (Headrick, Wilcock, & Batalden, 1998). For the main form of communication, issues to be discussed in a meeting should be declared and all the members should be encouraged to participate in the discussion in a controllable way (Michan & Rodger, 2000).

Additionally, effective communication may contribute to performance of teams in various ways. First of all, it would develop a sense of loyalty and control for each team member. Thus, members of teams will regard themselves valuable for the team, which will be more likely to result in participation in decision making processes. Second, communication establishes a suitable environment for decision making processes based on a consensus. Accordingly, individual expectations, demands, and skills will positively affect team productivity. Lastly, with effective communication, the environment will welcome creative ideas. Thus, problems will be effectively solved with creativity (Weiss, 1991).

## 2.5. RESEARCHES RELATED TO INSTANT MESSAGING

According to Ou and other's (2010) research instant messaging (IM) has become increasingly prevalent as a communication tool of choice for social networking. However, application of IM at work remains controversial due to the inherent challenges associated with quantifying the benefits for organizations. In this study we integrate social network theory and transactive memory theory to examine

IM's significance for organizations. They propose that IM has the potential to facilitate knowledge sharing by establishing relationship networks in the workplace, which sequentially enhance teamwork performance. This conceptual model is validated by 253 survey responses collected from employees of Chinese organizations. The data indicates that IM can empower teams at work via social networks and knowledge sharing. The theoretical and practical implications of the findings are discussed.

Instant messaging (IM) is one of the newest and fastest-growing communication technologies in the workplace today, yet little is known about its real implications for worker productivity. Rennecker and Godvin (2005) have taken the particular affordances of instant messaging as the basis for extrapolating from and linking prior studies of email use, polychromic communication, and task interruptions to develop propositions regarding the unanticipated individual-level productivity implications of widespread IM use in the workplace. They argue that while instant message communication may accelerate particular tasks and decision processes, unstructured IM use will likely contribute to erosion in individuals' overall productivity due to an increase in users' communicative workloads, engagement in polychromic communication, and an increase in the frequency of interruptions. They intend their proposed model and propositions as an impetus for further study of both the benefits and challenges of workplace instant messaging.

Communication plays a vital role in software development projects. Globally distributed teams use a mix of different communication channels to get the work done. In Dittrich and Giuffrida's (2011) paper, they report on an empirical study of a team distributed across Denmark and India. This paper explores the integration of formal documentation, bug-tracking systems and email with informal communication on Instant Messaging (IM), screen sharing, and audio conversations. Whenever overlap times occur, informal communication can take place at the same time in different sites, and it can effectively complement formal documentation. Their analysis provides an indication that IM can play a special role in such socio-technical communication systems: IM acts as a real time glue between different channels. The communication through IM also provides a means to build trust and social relationships with co-workers.

According to Bertolotti and others (2015) research, firms devoted to research and development and innovative activities intensively use teams to carry out

knowledge intensive work and increasingly ask their employees to be engaged in multiple teams (e.g., R&D project teams) simultaneously. The literature has extensively investigated the antecedents of single teams' performance, but has largely overlooked the effects of multiple team membership (MTM), i.e., the participation of a focal team's members in multiple teams simultaneously, on the focal team outcomes. In their paper they examine the relationships between team performance, MTM, the use of collaborative technologies (instant messaging), and work-place social networks (external advice receiving). The data collected in the R&D unit of an Italian company support the existence of an inverted U-shaped relationship between MTM and team performance such that teams whose members are engaged simultaneously in few or many teams experience lower performance. They found that receiving advice from external sources moderated this relationship. When MTM is low or high, external advice receiving has a positive effect, while at intermediate levels of MTM it has a negative effect. Finally, the average use of instant messaging in the team also moderated the relationship such that at low levels of MTM, R&D teams whose members use instant messaging intensively attain higher performance while at high levels of MTM an intense use of instant messaging is associated with lower team performance. They conclude with a discussion of theoretical and practical implications for innovative firms engaged in multitasking work scenarios.

Some scholars worry that Instant Messaging (IM), by virtue of the ease with which users can initiate and participate in online conversations, contributes to an increase in task interruption. Others argue that workers use IM strategically, employing it in ways that reduce interruption. Garrett and Danziger's (2007) article examines the relationship between IM and interruption, using data collected via a (U.S.) national telephone survey of full-time workers who regularly use computers (N = 912). Analysis of these data indicates that IM use has no influence on overall levels of work communication. However, people who utilize IM at work report being interrupted *less* frequently than non-users, and they engage in *more* frequent computer-mediated communication than non-users, including both work-related and personal communication. These results are consistent with claims that employees use IM in ways that help them to manage interruption, such as quickly obtaining task-relevant information and negotiating conversational availability.

After massive and rapid consumer adoption in recent years, instant messaging (IM) applications are beginning to move into the workplace. Vos, Hofte and Poot (2004) investigated the adoption of IM from four months before to three months after it was formally introduced in a mid-sized organization involved in knowledge work. Employees were free, within reasonable limits for private use, to use IM or not, not only with internal contacts (colleagues) but also with external contacts (work relations, friends, family). Based on data obtained before and after introduction from surveys, interviews, and communication traffic logs, we investigated the adoption of IM by individual users and pairs of users. They found a sudden and stable fourfold increase in IM use after introduction, both in terms of users and the number of conversations. IM users primarily report that IM improves the way they reach others and can be reached themselves. Technology self-efficacy, perceived compatibility of IM with work and pressure from social contacts at work to use IM explained best why some employees adopted and used IM more than others.

## SECTION THREE
## METHOD

### 3.1. AIM OF THE STUDY

The aim of this study to investigate the relationship among IM usage at work, knowledge sharing, social network, and teamwork performance. This study was conducted to confirm the structural model which was created to explain the relationship between, IM usage at work, social network, knowledge sharing, and teamwork performance.

### 3.2. IMPORTANCE OF THE STUDY

This is study is important in two ways. First of all, there is a gap in the literature to explain relationships between these variables. Secondly, this study applies Structural Equation Modeling which allows the researchers to have more than one independent and dependent variables at the same time.

### 3.3. HYPOTHESIS

The hypothesizes are;

**H1:** The use of IM at work has positive effect on social network at work.

**H2:** The use of IM at work has positive effect on shared knowledge at work.

**H3:** The social network in the work environment has positive effect on shared knowledge at work.

**H4:** The social network improves teamwork performance.

**H5:** The shared knowledge at work improves teamwork performance

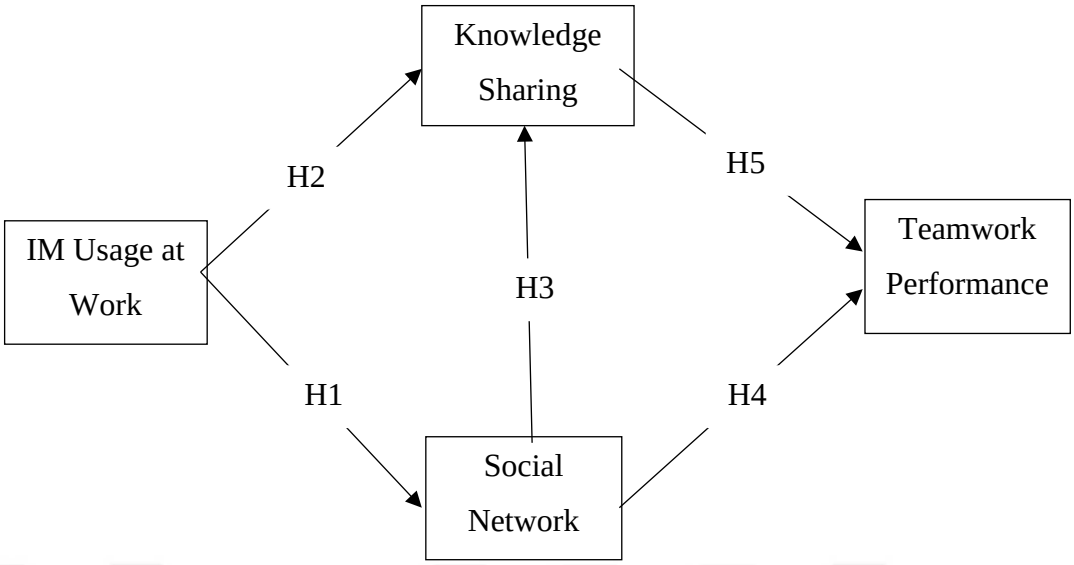


**Figure 3. 1.** The Conceptual Model of the Research

### 3.4. SAMPLING

Participants, 20 years of age and older, were eligible to participate in this study. Data were collected from a total of 188 people working in International Organizations in (United Nation Migration Agency (IOM) and World Food Program Agency (WFP) The survey was distributed convenience sampling was used. The participation for the study was voluntary. The potential population of participants in these organizations consists of 750 individuals. Due to various reasons (annual permit, external tasking and unwillingness), questionnaire data was obtained from 25.06% of population. The population includes residents of Gaziantep province and it is selected because of accessibility and differentiated branches. Employees of IOM and WFP form a heterogeneous distribution; hence they form a good sample for investigation.

### 3.5. METHODOLOGY

Firstly, sample characteristics and the information about IM usage at work were investigated. Secondly, the construct validity of the measure was investigated with factor analysis. Finally, the hypotheses were tested using the structural equation model.

### 3.6. THE SCALE

The scale includes two sections. The first section includes participants' demographic information and information about their use of IM applications. The second part includes 26 questions on a 7-point Likert scale (1=Strongly Disagree and 7=Strongly Agree). There are 4 items about social network, 7 items about knowledge sharing, 6 items about IM usage, and 9 items about teamwork performance (Carol X.J, 2010).

## SECTION FOUR
## FINDINGS AND DISCUSSION

On this section of the study, findings obtained from the analyses will be given and discussed. First of all, descriptive statistics concerning the respondents of the survey will be shown. Secondly, the results of the Analysis of Variance test will be given in order to compare IM usage at work between different users groups with different characteristics. Finally, by the results of Structural Equation Modeling (SEM), the relationship between, IM usage at work, social network, knowledge sharing, and teamwork performance will be exposed.

### 4.1. DESCRIPTIVE STATISTICS

Descriptive statistics about genders, ages, education levels, position at work, means of communication at work, usage of instant messaging at work, instant messaging use duration, frequency of instant messaging usage, IM applications types used at work, number of contacts through instant messaging and percentage of instant messaging contacts related to work are as described in the following tables.

**Table.4. 1** Distribution of Respondents by Gender

| Gender | Frequency | Percentage |
|---|---|---|
| Male | 127 | 67.6 |
| Female | 61 | 32.4 |
| Total | 188 | 100.0 |

Table 4.1. gives information related to the gender of respondents. Based on those information, 32.4% of respondents are females and 67.6% of them are males.

**Table.4. 2** Distribution of Respondents by Age

| Age Range | Frequency | Percentage |
|---|---|---|
| 20-25 years | 37 | 19.7 |
| 26-30 years | 66 | 35.1 |
| 31-35 years | 48 | 25.5 |
| 36 years and over | 30 | 16 |
| Missing | 7 | 3.7 |
| Total | 188 | 100.0 |

Table 4.2.showes information concerning respondents' age. This information points out that 19.7% of respondents are between 20-25 years old, 35.1% are between 26-30 years old, 25.5% are between 31-35 years old and 16% are older than years 36 old. The mean of respondents' age is 30.9 with a standard deviation of 7.93.

**Table.4.3** Distribution of Respondents by Education Level

| Highest Education Level | Frequency | Percentage |
|---|---|---|
| Secondary School | 6 | 3.2 |
| High School | 19 | 10.1 |
| University | 102 | 54.3 |
| Master | 52 | 27.7 |
| PhD | 8 | 4.5 |
| Missing | 1 | 0.5 |
| Total | 188 | 100.0 |

Table 4.3. discloses information about education level of respondents. 3.2% of the participants have secondary school degree, 10.1% of the participants have high school degree, 54.3% of the participants have college degree, 27.7% of the participants have master degree, and 4.5% of the participants have PhD degree.

**Table.4. 4** Distribution of Respondents by Position at Work

| Position at Work | Frequency | Percentage |
|---|---|---|
| Non-management | 123 | 65.4 |
| Employee Manager | 41 | 21.8 |
| Senior or Executive Manager | 17 | 9 |
| Missing | 7 | 3.7 |
| Total | 188 | 100.0 |

According to Table 4.4. revealing respondents' position at work, 65.4% of respondents work in a non-management position, 21.8% are employee manager, while 9% of them are either senior or executive manager. 3.7% of respondents did not state their position at work.

**Table.4. 5** Distribution of Respondents' Communication Tool Usage at Work

| Used Communication Tools | Frequency | Percentage |
|---|---|---|
| E-mail | 178 | 94.7 |
| Video Conference | 52 | 27.7 |
| Intranet | 79 | 42 |
| Knowledge Community | 32 | 17 |

Table 4.5. gives information related to respondents' communication tool usage at work. These information report that 94.7 of the participants use e-mail, 27.7% of the participants use video conference, 42% of the participants use intranet, and 17% of the participants use knowledge community as a communication tool at work.

**Table.4.6** Distribution of Frequencies of Communication Tool Usage by Respondents at Work

| Frequency of IM Application Usage at Work | Frequency | Percentage |
|---|---|---|
| Daily | 149 | 79.3 |
| Every Other Day | 27 | 14.4 |
| Weekly | 4 | 2.1 |
| Rarely | 6 | 3.2 |
| Missing | 2 | 1.1 |
| Total | 188 | 100 |

As shown in Table 4.6. 79.3% of the participants use IM applications at work daily, 14.4% of the participants use IM applications in every other day, 2.1% of the participants use IM applications weekly, and 3.2% of the participants use IM applications at work rarely.

**Table.4. 7** Distribution of IM Applications Types Used by Respondents at Work

| Types of IM Applicaitons Used at Work | Frequency | Percentage |
|---|---|---|
| WhatsApp | 168 | 89.4 |
| Skype | 117 | 62.2 |
| MS Messenger | 25 | 13.3 |
| Viber | 38 | 20.2 |

Table 4.7. shows types of IM applications used by respondents at work. 89.4% of the participants use WhatsApp application at work, 62.2% of the participants use Skype application at work, 13.3% of the participants use MS Messenger application at work, and 20.2% of the participants use Viber application at work

**Table.4. 8** Distribution of Respondents' IM Applications Contacts Number and Percentage of Them Related to Work

| Number of Contacts | Frequency | Percentage |
|---|---|---|
| None | 1 | 0.5 |
| 1 – 10 | 13 | 6.9 |
| 11 – 20 | 13 | 6.9 |
| 21 – 50 | 27 | 14.4 |
| 51 – 99 | 38 | 20.2 |
| 100 - 200 | 54 | 28.7 |
| 201 or above | 41 | 21.8 |

| Percentage of Contact Related to Work | Frequency | Percentage |
|---|---|---|
| None | 1 | 0.5 |
| 1% – 20% | 32 | 17 |
| 21% – 40% | 30 | 16 |
| 41% - 60% | 49 | 26.1 |
| 61% - 80% | 48 | 25.5 |
| 81% - 100% | 28 | 14.9 |

Table 4.8. states information about respondents' IM applications contacts number and percentage of them related to work. According these information, 0.5% of the participants does not have any contact in the IM application. 6.9% of the participants have between 1-10 contacts, 6.9% of the participants have between 11-20 contacts, 14.4% of the participants have between 21-50 contacts, 20.2% of the participants have between 51-99 contacts, 28.7% of the participants have between 100-200 contacts and 21.8% of the participants have more than 201 contacts in their IM applications.

Descriptive statistics including minimum and maximum points on each subscale and mean and standard deviations of the scales were presented in the following table.

**Table.4. 9** Descriptive Statistics about the Scale

| | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|
| IM Usage | 1 | 7 | 5.33 | 1.33 |
| Social Network | 1 | 7 | 5.40 | 1.04 |
| Knowledge Sharing | 1 | 7 | 5.05 | 1.19 |
| Teamwork Performance | 2 | 7 | 5.63 | 0.80 |

Table 4.9. Shows the total minimum score on IM Usage is 1 and the maximum score is 7 with a mean of 5.33 (*SD*=1.33). The minimum score on Social Network is 1 and the maximum score is 7 with a mean of 5.40 (*SD*=1.04). The minimum score on Knowledge Sharing is 1 and the maximum score is 7 with a mean of 5.05 (*SD*=1.33). The minimum score on IM Usage is 2 and the maximum score is 7 with a mean of 5.63 (*SD*=0.80).

**Table.4. 10** Descriptive Statistics about the Social Network Scale

| Social Network | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| I have developed good relationships with my colleagues. | 1 | 7 | 5.53 | 1.207 |
| I have built a social network with my colleagues. | 1 | 7 | 5.26 | 1.217 |
| I have cultivated ties with my colleagues. | 1 | 7 | 5.31 | 1.272 |
| I have many good contacts related to my work. | 1 | 7 | 5.49 | 1.266 |

Table 4.10. Shows the minimum score on subscale is 1 and the maximum score is 7 with a mean and SD for each Statement, which the most respondents are agreed somewhat.

**Table.4. 11** Descriptive Statistics about the Knowledge Sharing Scale

| Knowledge Sharing | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| I and my colleagues share each other's success and failure stories. | 1 | 7 | 5.15 | 1.685 |
| I and my colleagues share know-how from work experience with each other. | 1 | 7 | 5.00 | 1.504 |
| I and my colleagues share work reports and official documents with each other. | 1 | 7 | 4.86 | 1.637 |
| I and my colleagues share business manuals, models, methodologies with each other. | 1 | 7 | 4.92 | 1.454 |
| I and my colleagues share expertise obtained from education and training with each other | 1 | 7 | 5.26 | 1.373 |
| I and my colleagues share business knowledge obtained from newspaper, magazines, journals, and television. | 1 | 7 | 5.14 | 1.343 |
| I and my colleagues share each other's know-where and know-whom knowledge | 1 | 7 | 5.09 | 1.386 |

Table 4.11. shows the minimum score on subscale is 1 and the maximum score is 7 with a mean and SD for each Statement, which the most respondents are agreed somewhat and some undecided.

**Table.4. 12** Descriptive Statistics about the Teamwork Performance Scale

| Teamwork Performance | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| I am satisfied with the final project deliverables that my team submits. | 1 | 7 | 5.54 | 1.091 |
| I am satisfied with the project outcomes produced by my team. | 1 | 7 | 5.54 | 1.071 |
| I am satisfied with the final project deliverables that my team submits. | 2 | 7 | 5.69 | 1.067 |
| I am satisfied working with my team. | 2 | 7 | 5.70 | 1.069 |
| I am pleased with the way my teammates and I work together. | 1 | 7 | 5.78 | 1.061 |
| I am satisfied with my group members. | 2 | 7 | 5.82 | .980 |
| The work produced by my team is of a high quality. | 1 | 7 | 5.64 | 1.016 |
| The project outcomes from my team are excellent. | 1 | 7 | 5.54 | .988 |
| The deliverables of my team are outstanding. | 2 | 7 | 5.53 | 1.086 |

Table 4.12 shows the minimum score on subscale is 1 and the maximum score is 7 with a mean and SD for each Statement, which the most respondents are agreed somewhat.

**Table.4. 13** Descriptive Statistics about the Teamwork Performance Scale

| IM Usage | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|
| I often use IM applications to contact other people for my work | 1 | 7 | 5.38 | 1.409 |
| I regularly use IM applications to communicate with colleagues or customers in my daily work. | 1 | 7 | 5.29 | 1.489 |
| How often do you use IM applications to ask questions? | 1 | 7 | 5.13 | 1.509 |
| How often do you use IM applications to answer questions? | 1 | 7 | 5.33 | 1.418 |
| How often do you use IM applications to share files? | 1 | 7 | 4.71 | 2.317 |
| How often do you use IM applications to work-related socialization? | 1 | 7 | 5.14 | 1.438 |

Table 4.13 shows the minimum score on subscale is 1 and the maximum score is 7 with a mean and SD for each Statement, which the most respondents are agreed somewhat.

## 4.2. VALIDITY AND RELIABILITY

The construct validity of the measures investigated with factor analysis. Exploratory Factor Analysis (EFA) was conducted with PAF extraction and Direct Oblimin rotation ($\delta = 0$). The Kaiser-Meyer-Olkin Measure of Sample Adequacy had a value of .892, which was close to .90and considered adequate. Also, Bartlett's Test of Sphericity was significant ($\chi 2 = 2911.213$, $df = 325$, $p < .001$) indicating the correlation matrix is not an identity matrix. The factor structure confirmed that the

measure has four factors as expected which are knowledge sharing, social network, teamwork performance, and IM usage at work. The factor loadings are much higher than their expected scores at expected. Table 4.10. indicates the item loading for each factor. Knowledge sharing explained 36.94% of the total variance, social network explained 8.2% of the variance, teamwork performance explained 7.04% of the total variance, and IM usage at work explained 4.3% of the total score variance. The reliabilities of knowledge sharing, social network, teamwork performance, and IM usage at work are .901, .867, .905, and .799 respectively which also confirms the construct validity. All of the reliabilities are high, therefore, it can be concluded that the validity and reliability of the measures were provided.

**Table.4. 14** Results of the Principal Axis Factoring Exploratory Factor Analysis with Direct Oblimin Rotation (N = 188)

| Items | Factor | | | |
|---|---|---|---|---|
| | Knowledge Sharing | Social Network | Teamwork Performance | IM Usage |
| I and my colleagues share each other's success and failure stories. | .805 | | | |
| I and my colleagues share know-how from work experience with each other. | .724 | | | |
| I and my colleagues share work reports and official documents with each other. | .696 | | | |
| I and my colleagues share business manuals, models, methodologies with each other. | .692 | | | |
| I and my colleagues share expertise obtained from education and training with each other | .690 | | | |
| I and my colleagues share business knowledge obtained from newspaper, magazines, journals, and television. | .689 | | | |
| I and my colleagues share each other's know-where and know-whom knowledge | .668 | | | |
| I have cultivated ties with my colleagues. | | .787 | | |
| I have developed good relationships with my colleagues. | | .722 | | |
| I have built a social network with my colleagues. | | .617 | | |
| I have many good contacts related to my work. | | .616 | | |
| The project outcomes from my team are excellent. | | | -.838 | |
| The work produced by my team is of a high quality. | | | -.752 | |
| The deliverables of my team are outstanding. | | | -.683 | |
| I am pleased with the quality of my team's work. | | | -.646 | |

| | | |
|---|---|---|
| I am satisfied working with my team. | -.642 | |
| I am pleased with the way my teammates and I work together. | -.619 | |
| I am satisfied with my group members. | -.602 | |
| I am satisfied with the final project deliverables that my team submits. | -.529 | |
| I am satisfied with the project outcomes produced by my team. | -.475 | |
| How often do you use IM applications to ask questions? | | .907 |
| How often do you use IM applications to answer questions? | | .878 |
| How often do you use IM applications to work-related socialization? | | .479 |
| I regularly use IM applications to communicate with colleagues or customers in my daily work. | | .449 |
| How often do you use IM applications to share files? | | .393 |
| I often use IM applications to contact other people for my work | | .356 |

**Table.4. 15** Reliabilities of Scales

| Scales | Cronbach's Alpha |
|---|---|
| IM Usage | .799 |
| Social Network | .867 |
| Knowledge Sharing | .901 |
| Teamwork Performance | .905 |

In the table 4.15.shows The Cronbach Alpha reliability estimates are .867, .901, .905, and .799 for social network, knowledge sharing, teamwork performance, and IM usage at work respectively.

## 4.3. ANALYSIS OF VARIANCE (ANOVA) and T-Test

In order to compare IM usage at work according to gender, education level and position level at work, several ANOVA and T-test analyses were performed.

First of all, Table 4.16. compares respondents' IM usage at work according to gender. The mean values of IM usage between male and female are close to each other. T- test is performed in order to find out if there is a significant difference between those means.

**Table.4. 16** Mean and Standard Deviation of IM Usage Frequency at Work by Gender

| | Gender | N | Mean | SD |
|---|---|---|---|---|
| IM Usage at Work | Male | 125 | 5.1187 | 1.144 |
| | Female | 59 | 5.2740 | 1.166 |

When examining the Homogeneity of Variance test (Table 4.17.), it is assumed that variances are equal across groups as the significance value is 0,823>0,05.

**Table.4. 17** Homogeneity of Variances Test

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| ,050 | 1 | 182 | ,823 |

Table 4.18. exposes the results of T-test. The significance value is 0,394. This value is higher than 0,05, it is assumed that there is no significant difference concerning IM usage means between males and females.

**Table.4. 18** Homogeneity of Variances Test

| Source of Variance | df | Mean Difference | t | Significance |
|---|---|---|---|---|
| Between Groups | 182 | -.155 | -.854 | ,394 |

Secondly, Table 4.19. compares respondents' IM usage at work according to education level. The mean values of IM usage at work between respondents' from different education level are close to each other.

**Table.4. 19** Mean and Standard Deviation of IM Usage at Work by Education Level

| | Education Level | N | Mean |
|---|---|---|---|
| IM Usage at Work | Secondary School | 6 | 5.3889 |
| | High School | 19 | 5.0185 |
| | University | 100 | 5.0983 |
| | Master | 52 | 5.4608 |
| | PhD | 8 | 4.2917 |

Table 4.20. shwos the results of ANOVA test. The significance value is 0,065. This value is higher than 0,05, it is assumed that there is no significant difference concerning IM usage means between respondents from different level of education.

**Table.4. 20** Homogeneity of Variances Test

| Source of Variance | Sum of Squares | df | Mean Square | F | Significance |
|---|---|---|---|---|---|
| Between Groups | 11.695 | 4 | 2.924 | 2.258 | .065 |
| Within Groups | 230.444 | 178 | 1.295 | | |
| Total | 242.139 | 182 | | | |

Finally, Table 4.21. compares respondents' IM usage at work according to position at work. The mean values of IM usage between respondents' from different positions are close to each other.

**Table.4. 21** Mean and Standard Deviation of IM Usage at Work by Position at Work

| | Position at Work | N | Mean | SD |
|---|---|---|---|---|
| IM Usage at Work | Non-management | 121 | 5.09 | 1.08 |
| | Employee Manager | 41 | 5.46 | .1.44 |
| | Senior or Executive Manager | 17 | 5.11 | 1.02 |

Table 4.22. exposes the results of ANOVA test. The significance value is 0,288. This value being superior to 0,05, it is assumed that there is no significant difference concerning IM usage means between respondents from different position at work.

**Table.4. 22** Homogeneity of Variances Test

| Source of Variance | Sum of Squares | df | Mean Square | F | Significance |
|---|---|---|---|---|---|
| Between Groups | 5.127 | 3 | 1.709 | 1.265 | .288 |
| Within Groups | 234.977 | 174 | 1.350 | | |
| Total | 240.104 | 177 | | | |

## 4.4. STRUCTURAL EQUATION MODELING (SEM)

The structural model in this study was examined with MPlus. The results show that IM usage at work had a significant impact on social network ($b = 0.712$, $p < 0.001$) and knowledge sharing ($b = 0.962$, $p < 0.001$) which supports the first and second hypothesis. Social network has a significant impact on knowledge sharing ($b = 0.51$, $p = 0.001$). IM usage at work explained 20.9% of the social network variance. Social network and IM usage at work explained 23% of the variance of the knowledge sharing. Both social network ($b = 0.467$, $p < 0.001$) and knowledge sharing ($b = 0.408$, $p < 0.001$) had a significant impact on teamwork performance. Knowledge sharing and social network explained 39.6% of the variance in teamwork performance. Figure 4.1 displays the direct effects and R-squares. Table 4.17.shows the model fit indices

**Table.4.4 1** Summary of the Model Fit Indices SEM Model

| Model | $\chi^2$ | *Df* | RMSEA (90% CI) | SRMR | CFI | TLI |
|---|---|---|---|---|---|---|
| Model | 11.685* | 1 | .245 (.133- .179) | .044 | .942 | .932 |

*Note.* * $p$<.001. Initial Model= The original 3-factor; Model 1 =Error covariance was added between Item 3 and Item 16. $\chi^2$ = Chi-Square. RMSEA = Root-Mean-Square-Error of Approximation. SRMR= Standardized Root-Mean-Square Residual index; CFI = Comparative Fit Index. TLI = Tucker-Lewis Index

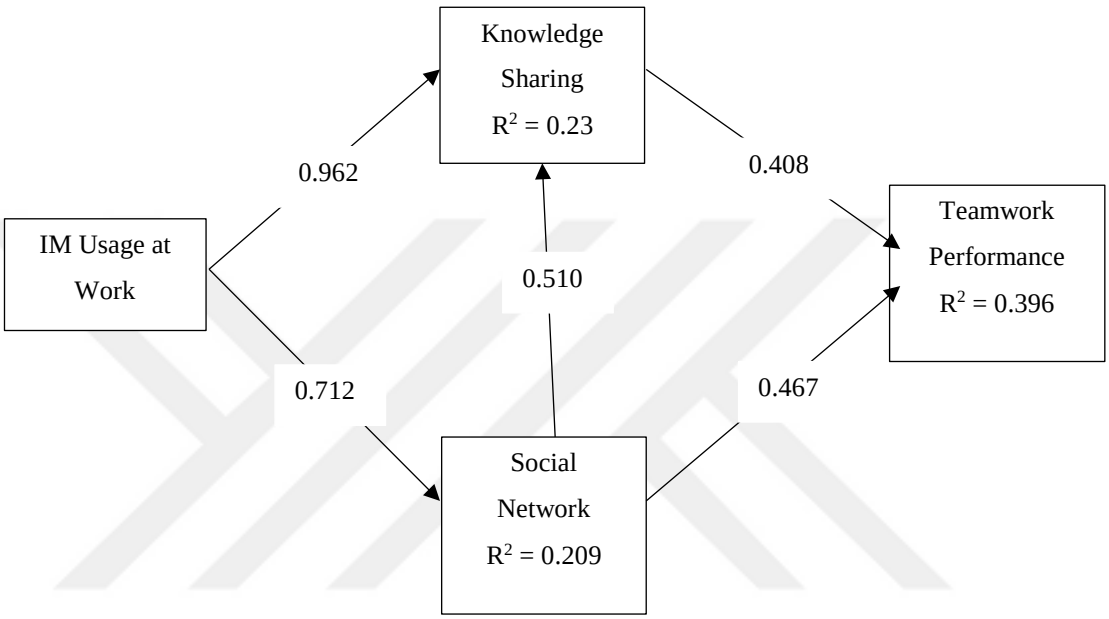


**Figure 3.4.2**. Direct Effect and R-Values

When IM usage increases one level or point Social Network increases 0.71 and Knowledge sharing increases 0.96. When Social Network increases one point Knowledge sharing increases 0.51 and teamwork performance increases 0.46. When knowledge sharing increases one point teamwork performance increases 0.40

## CONCLUSION and LIMITATIONS

The increase in the use of IM application in the work environment leads a research in this area. That is, many employees actively use IM applications in their work environment to communicate instantly. Therefore, there is a need for a research to investigate how use of IM applications result in some variables such as social network, knowledge sharing, and teamwork performance. Additionally, this study applied a structural equation model to investigate relationships between these variables.

The results of the study indicate that most of the participants have IM applications available and majority of participants use IM applications at work. The participants generally prefer to use more than one IM application and most of them use IM applications daily in their work environment. The results of factor analysis also confirmed the factor structure of the measures in the literature. The pattern matrix clearly indicated the factor structure of the measure and reliabilities of the factors are quite high.

The result indicates that the four major hypothesizes were confirmed. In other words, the path analysis model suggests that use of IM applications help participants improve their social network and share their knowledge with colleagues. Also, the more shared knowledge among participants result in higher levels of social interactions at work. As result of this the more social network and shared knowledge result in increase in teamwork performance. As a result of this it can be concluded that use of IM applications improves teamwork performance indirectly. Therefore, it can be concluded that, availability of the IM applications at work has a positive effect on work environment which directly affect social network and knowledge sharing directly and teamwork performance indirectly.

When compared with the result of previous study conducted by Cho and others (2005) -although the study is quite outdated as new IM tools have gained

popularity during the period- instant messaging is a very powerful tool in work environment. The stated study reveals that IM messaging improves work relationships from 82% to 89% and this data is similar to the results of this study.

In this context, social networking tools such as IM have considerable potential for ameliorating organizational performance, notably in distributed work contexts. They can be deployed to help organizational members achieve engagement, enhance productivity and manage knowledge assets. IM is an instrumental tool for the establishment of an effective relationship network, Collaborative work requires a complex mixture of knowledge-based procedures, processes, ideas, methods and mental models if better decisions are to be made and so team tasks accomplished. IM-facilitated relationship network is more appropriate since it ensures that relevant knowledge can be shared among members of the network. Furthermore, IM is a cost-effective technology tool suitable for both simple and complex tasks. As shown by this empirical research, IM has demonstrated its potential to drive new forms of personal and collaboration. We expect that our findings will be useful to both academics and practitioners, providing a compelling rationale to engage in social network research and utilization in organizations.

This study was conducted to provide an insight about IM tools in working environment, but it is limited in terms of sector and region. Future works on the subject with a wider region and different work places will surely reveal other important data for the literature.

One major limitation of the study is the sample size. As structural equation model is a complex statistical model, high number of sample size will provide more unbiased results. In this study the sample size is not small but higher number of participants will provide better results.

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**ANNEXES**

**ANNEX 1. Questionnaire**

Dear Participant,

This survey will be used in a thesis study. The purpose of the study is to examine the instant messaging applications and their value at work place. The data that you are going to provide will only be used for academic purposes and your personal data won't be exposed to any third party. We would like to thank you for your valuable contributions to our research.

Ahmad ISMAİL

University of Gaziantep

Economic and Administrative Sciences

Master's Student

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**Please check / write the correct answer for the following questions about yourself**

1. **Gender:** □Male □Female
2. **Age: ……**
3. **Education level:**

□Secondary □High School □University □Master's □Doctorate School

4. **Position at work:**

□Non-management □Employee Manager □Senior or executive manager

5. **Which of the following communication tools do you use at work?**

□E-mail □Video conference □Intranet □Knowledge Community

6. **Do you use Instant Messaging (IM) Applications (e.g. WhatsApp, Skype, Viber, etc.) at work?** □Yes □No

7. **How long have you been using IM applications at work? ..... (months-years)**

**8. How often do you use IM applications at work?**

□Daily □Every other day □Weekly □Rarely □Monthly

**9. Which of the following IM applications do you use at work?**

□WhatsApp □Skype □MS Messenger □ Viber □Other.....

**10. How many contacts do you have in the IM application you use:**

□None □1-10 □11-20 □21-50 □51-99 □100-200 □201 or above

**11. What percentage of your contacts in the IM application you use are related to work:**

□None □1-20% □21-40% □41-60% □61-80% □81-100%

**Please indicate your level agreement with the following statements by choosing the corresponding number**

**1**=Strongly Disagree **2**=Disagree **3**=Disagree Somewhat **4**=Undecided **5**=Agree Somewhat **6**=Agree **7**=Strongly Agree

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Social Network | | | | | | | |
| 1. I have developed good relationships with my colleagues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I have built a social network with my colleagues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I have cultivated ties with my colleagues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I have many good contacts related to my work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Sharing Explicit Knowledge | | | | | | | |
| 1. I and my colleagues share work reports and official documents with each other. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I and my colleagues share business manuals, models, methodologies with each other. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I and my colleagues share each other's success and failure stories. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I and my colleagues share business knowledge obtained from newspaper, magazines, journals, and television | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Sharing Implicit Knowledge | | | | | | | |
| 1. I and my colleagues share know-how from work experience with each other | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I and my colleagues share each other's know-where and know-whom knowledge | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I and my colleagues share expertise obtained from education and training with each other | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Outcome Satisfaction | | | | | | | |
| 1. I am satisfied with the project outcomes produced by my team. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2. I am pleased with the quality of my team's work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am satisfied with the final project deliverables that my team submits. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Group Satisfaction | | | | | | | |
| 1. I am satisfied with my group members | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I am pleased with the way my teammates and I work together | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am satisfied working with my team | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Outcome Quality | | | | | | | |
| 1. The work produced by my team is of a high quality | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The project outcomes from my team are excellent | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The deliverables of my team are outstanding | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Instant Messaging (IM) Usage at work | | | | | | | |
| 1. I often use IM applications to contact other people for my work | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I regularly use IM applications to communicate with colleagues or customers in my daily work | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

In your daily work, (1=Not at all …. 7=frequently)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3. How often do you use IM applications to ask questions? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. How often do you use IM applications to answer questions? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. How often do you use IM applications to share files? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. How often do you use IM applications to work-related socialization? | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## ÖZGEÇMİŞ

Ahmad Ismail 1984 yılında Suriye'de doğdu. Lisans öğrenimine kadar eğitimini Suriye'de tamamladı. Al Mamoun Üniversitesi İktisadi ve İdari Bilimler Fakültesi İşletme Bölümü'nden 2010 yılında mezun oldu. 2014 yılında Gaziantep Üniversitesi Sosyal Bilimler Enstitüsü İşletme Ana Bilim Dalı'nda İngilizce yüksek lisans eğitimine başladı. Ahmad Ismail'in anadili Arapça olmak üzere, ileri derecede de İngilizce ve Türkçe bilmektedir.

## VİTAE

Ahmad Ismail was born in Syria in 1984. He graduated from the Department of Business Administration Faculty of Economic and Administrative Sciences at Al Mamoun University in 2010. He has begun the Master of Business Administration in English at Gaziantep University. His native language is Arabic and he knows English and Turkish in advanced degree.