

THE ROLE OF CULTURAL FACTORS IN GROUPWARE ADOPTION  
AND DIFFUSION AT A NON-GOVERNMENTAL ORGANIZATION

ÖZGE YİĞİT  
114689009

İSTANBUL BİLGİ ÜNİVERSİTESİ  
SOSYAL BİLİMLER ENSTİTÜSÜ  
MARKETING YÜKSEK LİSANS PROGRAMI

PROF. AHMET SÜERDEM

2017

THE ROLE OF CULTURAL FACTORS IN GROUPWARE ADOPTION AND  
DIFFUSION AT A NON-GOVERNMENTAL ORGANIZATION

BİR SİVİL TOPLUM KURULUŞUNDA GRUP YAZILIMININ KULLANIMINI  
ENGELLEYİCİ KÜLTÜREL FAKTÖRLER

Öğrenci Adı: Özge Yiğit

Öğrenci Numarası: 114689009

Tez Danışmanı: Prof. Dr. Ahmet Süerdem İMZASI:



Jüri Üyesi: Prof. Dr. Beril Durmuş (Marmara Üniversitesi) İMZASI:



Jüri Üyesi: Asst. Prof. Baskın Yenicioğlu İMZASI:



Tezin Onaylandığı Tarih: 12.01.2017

Toplam Sayfa Sayısı: 83

**Anahtar Kelimeler (Türkçe)**

- 1) Grup Yazılımı
- 2) Kültür
- 3) Aktör-Ağ Teorisi
- 4) Sosyal Dünyalar Teorisi
- 5) Teknoloji Adaptasyonu

**Anahtar Kelimeler (İngilizce)**

- 1) Groupware
- 2) Culture
- 3) Actor-Network Theory
- 4) Social Worlds Theory
- 5) Technology Adoption

# **THE ROLE OF CULTURAL FACTORS IN GROUPWARE ADOPTION AND DIFFUSION AT A NON-GOVERNMENTAL ORGANIZATION**

## **SUMMARY**

Nowadays, there are many collaborative technologies in the market. While there are endless opportunities in terms of the functions these technologies possess, the success of these technologies is especially dependent on the extent they are adopted and diffused within organizations. In this regard, exploring the reasons behind why groupware technologies could not be adopted and diffused within organizations turn into an important matter.

Thus, the aim of this study was to explore cultural factors that prevent groupware adoption and diffusion at a non-governmental organization. By benefiting from the explanatory power of the combined approach of culture-as-practice and culture-as-system perspectives in the first place and the combined approach of the Actor-Network Theory and the Social Worlds Theory in the second place, the aim of study emerged as the exploration of cultural factors that prevent groupware adoption and diffusion at a non-governmental organization. Selecting interview in terms of a data collection method and seeking maximum variation in terms of a sample were rooted in the desire to understand the potential users of a groupware technology in a more detailed and comprehensive way. Ten people in total were interviewed at a non-governmental organization to learn about the current organizational structure at the organization, the working processes at the organization, the expectations from a collaborative technology, the perceived advantages of a groupware technology, the perceived disadvantages of a groupware technology and the elimination of these perceived disadvantages of a groupware technology.

As a result, four obstacles to the adoption and diffusion of a groupware technology were emerged. These four obstacles showed that different social worlds and different actors with

their actions could play an important role in the disuse of a groupware technology. These four obstacles could be stated as the role of professionalism within an organization, the role of current communication channels within an organization, the role of the use of social media and a groupware technology by influential people within an organization and lastly the role of accepted and traditionalized working habits within an organization.

There were important theoretical contributions of the study. The combined approach of culture-as-practice and culture-as-system perspectives in the first place and the combined approach of the Actor-Network Theory and the Social Worlds Theory in the second place enabled to explore the cultural factors in the disuse of a groupware adoption in a more comprehensive way.

There were two significant managerial implications in the adoption and diffusion of groupware. Firstly, social worlds do not have the same properties, so the introduction of a groupware technology needs the customized efforts towards different social worlds. Secondly, a groupware should not be seen only as the collaborative technology, it should also be identified as the collaborative actor as well.

There were three main research limitations in the study. These were about conducting the interviews with the limited number of respondents, focusing specifically on the cultural factors that prevent the adoption and diffusion of groupware, and considering Chatter as the particular groupware technology.

# BİR SİVİL TOPLUM KURULUŞUNDA GRUP YAZILIMININ KULLANIMINI ENGELLEYİCİ KÜLTÜREL FAKTÖRLER

## ÖZET

Günümüzde ortak çalışmayı sağlayan birçok teknoloji piyasada bulunuyor. Bu teknolojilerin sunduğu sayısız fonksiyon varken, başarının temeli bu teknolojinin organizasyon içerisinde ne kadar benimsendiğine ve yayıldığına bağlı olmaktadır. Bu bağlamda grup yazılımlarının organizasyonlarda neden kullanılmadığını araştırmak önemli bir konu haline dönüşmüştür.

Bu çalışmanın amacı bir sivil toplum kuruluşunda grup yazılımının kullanımını engelleyici kültürel faktörlerin belirlenmesidir. Bu süreçte de kültürün pratikler ile sistem perspektifinden tanımlanmasını birleştirmek ve Aktör-Ağ Teorisi ile Sosyal Dünyalar Teorisi entegrasyonunu sağlamak çalışmanın güç aldığı iki teorik altyapı olmuştur. Kalitatif ilerletilen çalışmada teorik altyapının gerekli kıldığı şekilde veri toplama tekniği olarak mülakat tekniği uygulanmıştır ve örneklem grubu olarak maksimum çeşitleme tercih edilmiştir. Bir sivil toplum kuruluşundaki 10 kişi ile organizasyonel yapı, çalışma süreçleri, grup yazılımından beklentileri, bu teknolojinin algılanan avantajları, bu teknolojinin algılanan dezavantajları, bu teknolojinin algılanan dezavantajlarının nasıl yok edilebileceği üzerine sohbet edilmiştir.

Çalışma sonucunda grup yazılımının benimsenmesinde ve yayılmasında dört engelleyici faktör ortaya çıkmıştır. Bu engelleyici faktörler şu şekilde sıralanabilir: profesyonelliğin rolü, kullanılan güncel iletişim kanallarının rolü, etkin kişilerin sosyal medya ve grup yazılımı kullanmasının rolü ve son olarak kabullenilmiş ve gelenekselleştirilmiş çalışma alışkanlıkları.

Bu çalışma önemli teorik katkıları da beraberinde getirmiştir. Kültürün pratikler ile sistem perspektifinden tanımlanmasını birleştiren bakış açısı ve Aktör-Ağ Teorisi ile Sosyal Dünyalar Teorisi entegrasyonunu sağlayan bakış açısı grup yazılımının kullanılmamasına yönelik daha kapsamlı bir açıklama getirmiştir.

Bu çalışma iki önemli yönetimsel çıkarımda bulunmuştur. İlk olarak organizasyon içindeki sosyal dünyaların birbirinin aynısı olmadığı bilinmelidir. Bu bakımdan grup yazılımının kullanılmasının farklı sosyal dünyalarda farklı eforlar gerektirdiği anlaşılmalıdır. İkinci olarak grup yazılımı yalnızca bir kolaboratif teknoloji olarak düşünülmemelidir. Bu bakımdan grup yazılımının da kolaboratif bir aktör olduğu unutulmamalıdır.

Bu çalışma araştırmanın üç temel açıdan kısıtlandığını belirtmektedir. Bunlardan ilki mülakatların kısıtlı sayıda katılımcı ile gerçekleştirildiği üzerinedir. İkincisi, bu çalışmada sadece kültürel faktörlerin grup yazılımının kullanılmamasındaki engelleyici rolü ele alınmıştır. Üçüncüsü, bu çalışmada sadece Chatter adlı grup yazılım teknolojisi ele alınmıştır.

## **ACKNOWLEDGEMENTS**

I would like to thank the following people, without whose help and support this thesis would not have been possible.

Firstly, I would like to show my gratitude to my thesis advisor Prof. Ahmet Süerdem for his suggestions, encouragements and guidance from the beginning to the end of the study whenever I needed his help.

I would like to thank my department advisor Prof. Selime Sezgin for her never-ending support.

I am also grateful to my mother, sister and husband who always encouraged me with their best wishes.

I would also like to thank all the academicians of Bilgi University Marketing Department for their contributions to my academic life.

January 2017

Özge Yiğit

Graduate Student

M.A. in Marketing (English)

## TABLE OF CONTENTS

ABBREVIATIONS .....	8
1. INTRODUCTION .....	10
1.1. The Purpose of the Thesis .....	10
1.2. The Scope of the Study .....	10
1.3. Key Findings and Implications of the Study .....	11
2. DEFINITIONS AND THEORETICAL BACKGROUND RELATED TO GROUPWARE .....	14
2.1. Technology Adoption and Diffusion.....	14
2.2. Groupware Adoption and Diffusion.....	15
2.2.1. History of Groupware .....	16
2.2.1.1. CSCW (Computer-Supported Cooperative Work) .....	16
2.2.1.2. Linkage between CSCW and Groupware.....	18
2.2.2. Classification of Groupware.....	18
2.2.2.1. Classification in terms of Time and Space .....	19
2.2.2.2. Classification in terms of Functionality .....	20
2.2.2.2.1. Olson and Olson’s Taxonomy .....	21
2.2.2.2.2. The 3 C Model .....	24
2.2.3. Challenges of Groupware.....	25
3. THE ROLE OF CULTURE ON GROUPWARE ADOPTION AND DIFFUSION: TRADITIONAL AND NON-TRADITIONAL APPROACHES .....	30
3.1. The Concept of Culture in the Traditional and Non-Traditional Approaches to Groupware Adoption and Diffusion .....	30
3.1.1. Culture-As-System and Culture-As-Practice Perspectives .....	31
3.1.2. The Combination of Culture-As-System and Culture-As-Practice Perspectives ....	32
3.2. Traditional Approaches to Groupware Adoption and Diffusion .....	34
3.2.1. Individual Level of Adoption and Diffusion.....	35
3.2.1.1. Diffusion of Innovations Theory.....	35
3.2.1.1.1. Innovation decision process theory.....	37
3.2.1.1.2. Individual innovativeness theory .....	38
3.2.1.1.3. Rate of adoption theory .....	38
3.2.1.1.4. Perceived attributes theory .....	39
3.2.1.2. Technology Acceptance Model .....	40
3.2.2. Work-Unit Level of Adoption and Diffusion.....	41
3.2.2.1. Examples on Work-Unit Level of Adoption and Diffusion .....	42

3.2.3. Organizational Level of Adoption and Diffusion .....	44
3.2.3.1. Examples on Organizational Level of Adoption and Diffusion .....	44
3.2.4. Adoption and Diffusion at Multiple Levels .....	45
3.2.4.1. Example on Adoption and Diffusion at Multiple Levels .....	46
3.3. Non-Traditional Approaches to Groupware Adoption and Diffusion .....	48
3.3.1. Actor-Network Theory.....	49
3.3.1.2. Actor-Network Theory in Groupware Adoption and Diffusion .....	51
3.3.2. Social Worlds Theory .....	52
3.3.2.1. Social Worlds Theory in Groupware Adoption and Diffusion .....	54
4. RESEARCH METHODOLOGY .....	57
4.1. Research Questions .....	57
4.2. Setting and History.....	59
4.2.1. TEGV .....	59
4.2.2. Chatter.....	61
4.3. Sampling and Data Collection Method .....	63
4.4. Research Methodology.....	65
5. RESULTS .....	68
5.1. Valuing versus Balancing: Importance attributed to professionalism .....	68
5.2. Connecting versus Disconnecting: Disconnection through communication channels or connection through Chatter .....	70
5.3. Perceived Interest versus Perceived Disinterest: Use of groupware by influential people .....	72
5.4. Being Traditionally versus Being Innovative: Internalization of working habits .....	73
6. DISCUSSION .....	75
6.1. Theoretical Implications .....	76
6.2. Managerial Implications .....	78
6.3. Research Limitations.....	79
REFERENCES.....	81

## **ABBREVIATIONS**

**ANT:** Actor-Network Theory

**CSCW:** Computer-Supported Cooperative Work

**IS:** Information System

**IT:** Information Technology

**NGO:** Non-Governmental Organization

**TAM:** Technology Acceptance Model

**TEGV:** Educational Volunteers Foundation of Turkey

**TV:** Television

## LIST OF FIGURES

<b>Figure 1:</b> The time/space classification .....	21
<b>Figure 2:</b> The 3 C Model .....	26
<b>Figure 3:</b> The Four Moments of Translation .....	52
<b>Figure 4:</b> The representative image of Chatter as mobile app.....	63

## **1. INTRODUCTION**

### **1.1. The Purpose of the Thesis**

With the existence of the increasing number of groupware technologies at work, potential users at organizations start to face the adoption challenges of these technologies. Hence, the disuse of these technologies by their potential users becomes a common issue at organizations. The aim of this study was defined as the exploration of cultural factors that prevent groupware adoption and diffusion at a non-governmental organization. To elaborate on the cultural factors that prevent the use of a groupware technology at a non-governmental organization, the below issues emerged. Therefore, interviews with people from a non-governmental organization focused on these issues:

- the current organizational structure at the organization
- the working processes at the organization
- the expectations from the collaborative technology
- the perceived advantages of the introduced technology
- the perceived disadvantages of the introduced technology
- the elimination of these perceived disadvantages of the introduced technology

### **1.2. The Scope of the Study**

The study is organized under five main headings. Firstly, the definitions and theoretical background related to groupware is elaborated. This chapter is important to understand the core concepts of the study. In this regard, the definition of technology adoption and diffusion, the definition of groupware adoption and diffusion, the historical background of groupware, the classification of groupware and the challenges of groupware are assessed. Secondly, the

role of culture on groupware adoption and diffusion is explained and identified with traditional and non-traditional approaches to groupware adoption and diffusion. This chapter is significant to comprehend the theoretical background of the study. In this regard, culture-as-system and culture-as-practice perspectives are stated and the integration of these two perspectives is elaborated. The traditional and non-traditional approaches to groupware are expressed. When it comes to traditional approaches, the pre-determined unit of adoption, such as individual or work-unit level of adoption and diffusion, plays an important role. On the other hand, when it comes to non-traditional approaches, the pre-determined unit of analysis is criticized. Thirdly, the research methodology of the study is mentioned. This chapter is important to understand the details of the research like the research questions, the setting and history, the sampling and data collection method, and the analysis part of the study. Fourthly, the results of the study are explained. In this chapter, the four emergent obstacles are described in line with the Actor-Network Theory and Social Worlds Theory. Fifthly, the implications of the study are stated. In this regard, not only the theoretical and managerial implications of the study, but also the research limitations of the study are reflected.

### **1.3. Key Findings and Implications of the Study**

There are four key findings of the study. These four obstacles show that different social worlds and different actors with their actions could play an important role in the disuse of a groupware technology. There are also significant implications of the study. These implications of the study can be utilized both theoretically and practically. The key findings of the study in the first place and the implications of the study in the second place are briefly mentioned.

To begin with the role of professionalism within an organization as the first emergent obstacle, there are two matters to be considered. Firstly it was found that people at the

organization would want to neither cross the line nor do something wrong, which could prevent any kind of participation and the use of any technologies that promote participation. Secondly, it was found that negotiations and persuasions between people would support the idea of “professionalism” and “its uniqueness”, not “collaboration” or “participation”.

When it comes to the role of current communication channels within an organization as the second emergent obstacle, it was explored that the current communication channels that have been used for years would pose an obstacle to the use of the groupware technology. The existing communication channels therefore could create disconnection, rather than connection at the organization.

When it comes to the role of the use of social media and a groupware technology by influential people within an organization as the third emergent obstacle, it was identified that the excuse for not using the groupware technology would be presented as the dislike for social media in general. The attitude of supporting but not preferring the use of a technology thus could be an obstacle to the adoption and diffusion of the groupware technology.

When it comes to role of accepted and traditionalized working habits within an organization as the fourth emergent obstacle, there were three matters to be considered. Firstly, it was discovered that people at the local units would accept and routinize the use of the mainstream social media channels like Facebook or Whatsapp as the main collaboration tools. Secondly, it was discovered that the traditionalized escape from problems and complaints would be identified as inconsistent with the nature of the groupware technology. Lastly, it was discovered that slow work would be liked and supported, so adopting not only a groupware technology but any kind of technology could therefore be seen as difficult and time-consuming.

In terms of the implications of the study, there are both theoretical and managerial inferences of the study. From a theoretical perspective, it was proposed that studying groupware adoption and diffusion through practical activities (culture-as-practice) could be seen as complementary to studying it through a structure of meanings (culture-as-system). Besides, it was suggested that the non-traditional approaches of the Actor-Network Theory and the Social Worlds Theory could be combined as a theoretical background. From a managerial perspective, it was pointed out that social worlds do not have the same properties, so the introduction of a groupware technology needs the customized efforts towards different social worlds. Moreover, it was claimed that a groupware should not be seen only as the collaborative technology, it should also be identified as the collaborative actor as well.

In conclusion, there are emergent obstacles of the study. In addition to these obstacles, there are certain theoretical and managerial contributions of the study as well. Both the obstacles and the implications give important insights into the disuse of groupware adoption and diffusion at organizations.

## **2. DEFINITIONS AND THEORETICAL BACKGROUND RELATED TO GROUPWARE**

In this chapter, the basic information about groupware is mentioned. Firstly, the concept of technology adoption and diffusion is explained. Secondly, in line with this conceptualization, the concept of groupware adoption and diffusion is considered. Thirdly, after the explanation of these necessary conceptual frameworks, the historical background of groupware is evaluated. In this regard, the linkage between computer-supported cooperative work (CSCW) and groupware is identified. Fourthly, the classification of groupware is elaborated. Two main types of taxonomy are taken into consideration, which are namely the classification in terms of time and space and the classification in terms of functionality. In this regard, there are three important classifications to be emphasized and compared to each other. One of them is identified under the classification in terms of time and space and the other two is identified under the classification in terms of functionality. Lastly, the important challenges of groupware for both users and product developers are explored in detail.

### **2.1. Technology Adoption and Diffusion**

It is important to understand what are meant by technology adoption and diffusion because these definitions constitute the basis of groupware adoption and diffusion. Throughout the years, technology adoption and diffusion have been conceptualized in many ways. The reason behind the emergence of these various definitions comes from the different thoughts on what properly identifies and encompasses technology, adoption and diffusion together.

Even though the various definitions of technology adoption and diffusion in the literature can be confusing, Eneh (2010) achieved to propose the definitions of technology adoption and diffusion which succeed to give a core meaning of the terms in a simple way. He defined technology adoption as “the phase in which a technology is selected for use by an individual

or a given group of people” (Eneh 2010, p. 1815). With regard to technology adoption, he defined technology diffusion as “the phase in which the technology spreads to general use and application” (Eneh 2010, p. 1815).

All in all, there are not particular definitions of technology adoption and diffusion. In this sense, the simply stated descriptions by Eneh (2010) on technology adoption and diffusion pave the way to get a clear understanding of the terms. After understanding the meaning of technology adoption and diffusion, it is significant to identify which specific technology to be considered in this study, namely groupware.

## **2.2. Groupware Adoption and Diffusion**

Comprehending the definition of groupware is necessary to focus on a specific technology and understand its particular process of adoption and diffusion in the next chapter of this study. The most common definitions of groupware either focus on the nature of technology or the functionality of this technology. However, Lococo and Yen (1998) proposed a definition that achieves to combine the nature and functionality of groupware. On the basis of this definition of groupware by Lococo and Yen (1998) and the definitions of technology adoption and diffusion by Eneh (2010), groupware adoption and diffusion are identified at the end of this section.

Lococo and Yen (1998, p. 86-87) presented various definitions of groupware - that shows how groupware has been conceptualized in the literature. For example, Korzeniowski (1997) particularly pointed out the nature of technology by describing groupware as “enabling technology that addresses the vast areas of human-computer interaction and human-human interaction through digital media to bring substantial improvement and formation to organization.” On the other hand, Lylod (1994) emphasized specifically the functionality of

groupware by conceptualizing groupware as “groupware is any technology that improves group productivity.” These definitions are not sufficient to precisely define groupware.

Groupware has emerged with technology to enable its collaborative functionality. Therefore, not only the nature of technology but also the functionality of this technology should be included in the definition of groupware. In this sense, groupware can be conceptualized as “hardware or software technology that enables a means for human collaboration” (Lococo and Yen 1998, p. 86).

After understanding the definition of groupware, it is required to define groupware adoption and diffusion. In line with the definition of technology adoption and diffusion by Eneh (2010), groupware adoption and diffusion can be defined as the process from the selection of a groupware tool to the spread of this tool by a given group of people.

To sum up, when it comes to definition of groupware, the emphasis varies on the basis of either nature of technology or the functionality of this technology. However, combining these two different perspectives is crucial to understand the concept of groupware and the process of its adoption and diffusion.

### **2.2.1. History of Groupware**

To get historical knowledge on groupware necessitates firstly looking at the emergence of the term CSCW (Computer-Supported Cooperative Work) and then understanding the link between CSCW and groupware. Even though CSCW and groupware have different meanings, they do not strictly exclude each other. While the definition of CSCW only looks into the effect of technologies on the work environment, the definition of groupware includes both the nature of a technology and the effect of a technology by exploring the functionality of it.

#### **2.2.1.1. CSCW (Computer-Supported Cooperative Work)**

Computer-supported cooperative work and groupware have been identified as synonyms in many studies. However, the terms CSCW and groupware constitute different meanings even though they are deeply related to each other. Because groupware has its root in CSCW, it is significant to historically know CSCW and its relation to groupware at first.

The emergence of the concept of CSCW was linked to the technological advances and their effects on the working life became increasingly apparent in the 1980s. In 1984, Iren Greif of Massachusetts Institute of Technology and Paul Cashman of Digital Equipment Organization took the first step and organized a workshop that twenty people from various professional backgrounds – but with a shared interest on the role of technology in the work environment came together (Grudin 1994a, p. 19). In this workshop, elaborating on the role of technology in the work environment made this group of people coined the term computer-supported cooperative work to name their main topic of interest (Grudin 1994, p. 19). Thus, it can be said that the effects of technology on the work environment was categorized under the umbrella term CSCW in this meeting.

The term groupware was coined at the end of 1980s. Grudin (1994, p. 20) said that the term groupware was coined when there was an increasing criticism that cooperative work is a goal rather than a reality to be described. Therefore, the absence of consensus on a particular definition of CSCW has resulted in the common use of groupware to imply CSCW. This situation has blurred the line between the definitions of CSCW and groupware.

In conclusion, the term CSCW was coined as an umbrella term to investigate the role of technology in the work environment in 1984, but after the term groupware came to the fore at the end of 1980s, it has started to be used instead of CSCW. In this regard, the problem is that the term groupware not only considers the impact of technology but also considers the nature of technology itself.

### **2.2.1.2. Linkage between CSCW and Groupware**

There are two issues to be considered when looking at the linkage between CSCW and groupware. The first issue is that the use of CSCW and groupware as synonyms has resulted in attempts to differentiate these two terms from each other. The second issue considers how these attempts to differentiate groupware from CSCW have created a difficulty on the conceptualization of groupware.

Firstly, the use of CSCW and groupware as synonyms has caused attempts to make distinctions between CSCW and groupware. These attempts mostly neglect the linkage between CSCW and groupware. From this point of view, CSCW “looks beyond applications to the organizational impact of technology” and groupware “is in contrast a technology – often a commercial product” (Grudin 1999, p. 2). This strict division between the definitions CSCW and groupware has prevented to see the linkage between these two terms.

The second issue is related to the strict division of CSCW and groupware. If groupware is defined only as “a technology”, the collaborative functionalities of groupware and the impact of these functionalities on people will be ignored. Nevertheless, if groupware is defined “hardware or software technology that enables a means for human collaboration”, groupware will then take into consideration not only a specific technology, but also the impact of technology on a group of people.

To conclude, the conceptualization of groupware in this thesis does not exclude CSCW. Groupware takes into consideration not only a specific technology with collaborative features, but also the impact of technology on this group of people.

### **2.2.2. Classification of Groupware**

For more than two decades, groupware has been classified and analyzed on the basis of diverse criteria. This section gives review of two types of classification. The first taxonomy provides classification on the basis of time and space. The second taxonomy provides classification on the basis of the functional features of groupware. There are also other taxonomies of groupware that are not mentioned in this study because of their heavy focus on the technicality of groupware, such as software, hardware, and scalability dimensions.<sup>1</sup>

### 2.2.2.1. Classification in terms of Time and Space

This classification of groupware technologies is distinguished by when and where the interaction takes places. In this regard, groupware is categorized along with the dimensions of time and space.

<i>Time</i>	<b>Same</b>	Computer-mediated meeting rooms Electronic classrooms	Bulletin boards Electronic newsgroups
	<b>Different</b>	Chat Audio-video conferencing White boarding	Non-real time conferencing Workflow E-mail
		<b>Same</b>	<b>Different</b>
		<i>Space</i>	

**Figure 1:** The time/space classification (Bafoutsou and Mentzas 2002, p. 282)

In the Figure 1, the horizontal dimension indicates the location of participants: they can be either at the same place (co-located) or at different places (remote) (Bafoutsou and Mentzas 2002, p. 282). The vertical dimension indicates whether the interaction occurs at the same time (synchronous) or at different times (asynchronous) (Bafoutsou and Mentzas 2002, p. 282). These dimensions provide four possibilities: synchronous, co-located such as computer-

<sup>1</sup> For more information, you may see Jarczyk, Loffler, and Volksen (1992).

mediated meeting rooms and electronic classrooms; asynchronous, co-located such as chat, audio-video conferencing, and white boarding; synchronous, remote such as bulletin boards and electronic newsgroups; and asynchronous, remote such as non-real time conferencing, workflow, and e-mail (Bafoutsou and Mentzas 2002, p. 282).

When it comes to the advantages and disadvantages of this taxonomy, there are two things to be noted. The advantage of this taxonomy is that it is easy to learn. However, whether or not every groupware technology falls into one or another category of this classification is questionable. For example, e-mail as a groupware technology is not different than chat in today's working life in terms of functionality. Instead of using chat, many people send short and instant e-mails to collaborate with each other. Besides, today's many groupware technologies integrate many of the groupware technologies that are illustrated in the Figure 1. For instance, electronic workspace as a groupware technology integrates the functions of e-mail, chat, whiteboard, and workflow. In short, the four categories in the time/space taxonomy do not allow for the reflection of usage similarities between groupware technologies and also do not allow for the reflection of the integration of many groupware technologies in one groupware technology.

To sum up, the time and space taxonomy is the most well-known classification of groupware technologies. Nevertheless, by considering the main advantage and disadvantage of the taxonomy, it can be said that this taxonomy is mostly appropriate as a starting point to classify and understand the basic groupware technologies.

#### **2.2.2.2. Classification in terms of Functionality**

This classification of groupware technologies is distinguished by the functions of groupware. In this regard, two different taxonomies are elaborated in detail. One of them is the taxonomy of Olson and Olson (2002) under four broad headings, which are communication support

tools, coordination support tools, information sharing, and integrated systems. Second of them is the 3 C model of Fuks et al. (2007; 2008) in terms of three dimensions, which are communication, cooperation, and coordination dimensions. By elaborating these two important taxonomies, their benefits and drawbacks are identified and compared to each other.

#### **2.2.2.2.1. Olson and Olson's Taxonomy**

The first taxonomy in terms of functionality belongs to Olson and Olson (2002). This classification is realized under the four functional categories: communication support tools, coordination support tools, information repositories, and then integrated systems. Under these broad headings, the authors tried to particularly list and illustrate common groupware technologies.

Firstly, among communication support tools, e-mail is identified as the most successful communication tool due its widespread use; so people prefer e-mail to span distance and time and to disseminate information to broad communities (Olson and Olson 2002, p. 585).

Conferencing tools (video conferencing especially) are mentioned as the most familiar technology to support remote meetings and it is noted that the additional features that are integrated to conferencing tools like the ability to share the objects that are talked make these tools very useful (Olson and Olson 2002, p. 586). Thirdly, it is said that instant messaging serves as the development and strengthening of informal social relations because once a person registers on a system of instant messaging, this person can see whether or not other registered people are on the system (online, offline busy, etc.) and, get and send messages (Olson and Olson 2002, p. 587). Then, chat is identified as similar to both instant messaging and e-mail because people usually aim to have or send information like e-mail but they also use some conversational clues like instant messaging (Olson and Olson 2002, p. 586).

When it comes to coordination support tools, meeting support tools are identified mostly as brainstorming tools. Specifically, virtual whiteboard is illustrated as a well-known groupware technology that is useful to organize people's ideas into a coherent whole by recognizing the nature of a document such as list or outline and then by changing things sensibly (Olson and Olson 2002, p. 588). After meeting support tools, workflow systems are cited as a groupware technology that supports the coordinated steps of sequential activities among people working on a specific task by assigning people to the specific steps of this given task and then by indicating whether or not these steps are taken (Olson and Olson 2002, p. 589). Then, group calendars are pointed out as another groupware system that enables to view people's time schedules and to determine meetings (Olson and Olson 2002, p. 589). Last but not least, awareness tools enable people to know about their colleagues through many ways to facilitate work performance, such as seeing in which folders people are and what they are doing (Olson and Olson 2002, p. 589).

Thirdly, information repositories are mentioned. Sharing information on the web - both in public and intranet settings – and also through specific kind of applications like IBM Notes is included under this heading. The goal in this regard is “to capture knowledge that can be reused by others like instruction manuals, office procedures, training, and boilerplate or templates of commonly constructed genres like proposals and bids” (Olson and Olson 2002, p. 590). Even though this category of information repositories is separate from the categories of communication and coordination tools, today's many groupware technologies involve the functional features of all these three distinctive headings mentioned above. Therefore, the last category, which is namely integrated systems, was created by the authors.

Last but not least, the category of integrated systems is proposed as the other category. Under this heading, Olson and Olson (2002) did not prefer to list the important integrated systems.

The most expected reason for not listing could be that the overwhelming majority of

integrated systems have the functional features of various groupware technologies. This situation could make listing harder. Therefore, it can be said that this category seem to be more exhaustive than the other categories.

In terms of the benefits and drawbacks of this taxonomy, the most notable contribution of this taxonomy is its detailed list of basic groupware tools that today's groupware technologies cover. Today, many of these cited basic groupware technologies are now seen as the basic functions of many integrated groupware technologies. For example, electronic workspace as a groupware technology integrates the functions of e-mail, chat, whiteboard, and workflow.

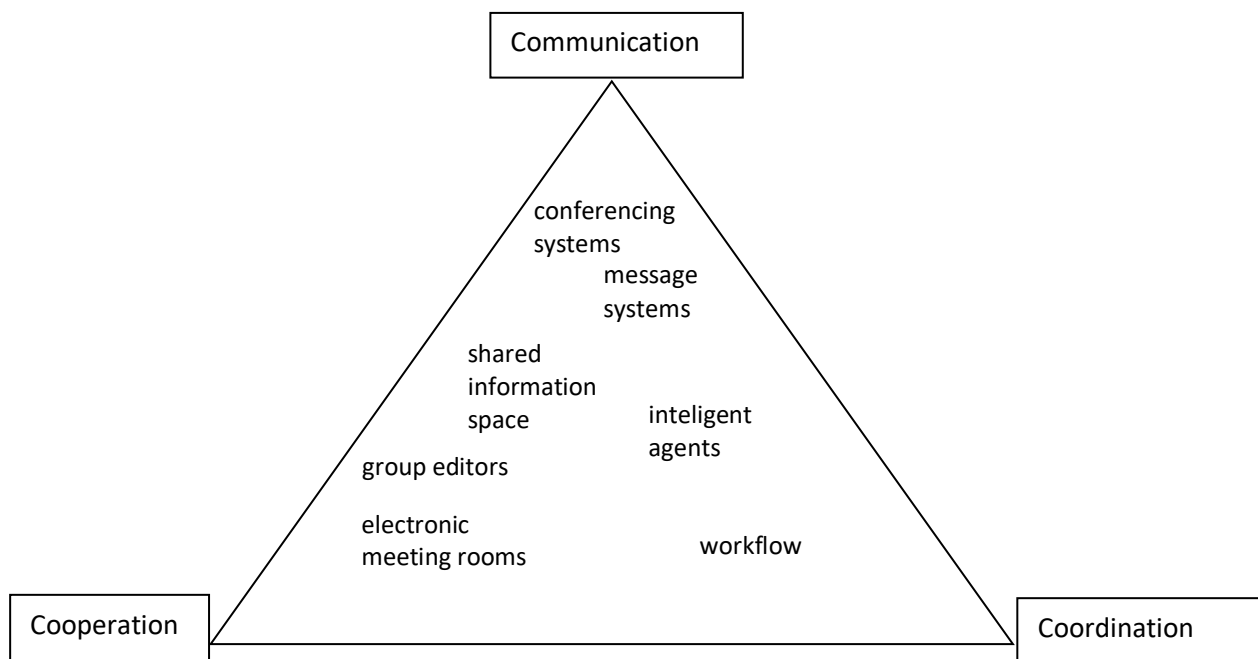
Nevertheless, this taxonomy has a significant problem in terms of the identification of categories. The categories in this taxonomy are not well-distinguished. For instance, it is hard to differentiate information repositories from communication and coordination tools because information repositories like IBM Notes have the functional aspects of not only the category of communication support tools but also coordination support tools. Secondly, the last category of integrated systems is a very exhaustive category in comparison to the other three categories. If the most significant contribution of this taxonomy of Olson and Olson (2002) is about listing groupware technologies to a great extent, then the category of integrated systems creates the biggest problem with its broadness. Under this heading, listing groupware technologies on the basis of their functions is difficult because with every technological improvement, this category will be likely to need revision.

In conclusion, this taxonomy of Olson and Olson (2002) emphasizes four functional categories. These categories are namely communication support tools, coordination support tools, information repositories and integrated systems. The taxonomy is beneficial in terms of listing important groupware technologies which are now considered as the basic functions of current groupware technologies like e-mail and group calendars. On the other hand, the

taxonomy has a problem in terms of categorization. The category of integrated systems is so broad, but the category of information sharing is comparatively small.

#### 2.2.2.2.2. The 3 C Model

The 3 C model categorizes groupware functions in between three dimensions. These dimensions are namely communication, cooperation, and coordination dimensions.



**Figure 2:** The 3 C Model (Fuks et al. 2008, p. 1)

According to the 3 C model, collaboration dynamics of groupware are consisted of communication, cooperation, and coordination dimensions. Communication is associated with the exchange of messages and information among people; coordination is associated with the management of people, their activities and resources; and cooperation is associated with the production taking place on a shared workspace platform (Fuks et al. 2007, p. 637). As the Figure 2 shows, the 3 C model keeps the attention on the interdependency of communication, cooperation, and coordination aspects of groupware technologies to achieve collaboration. Chat as a communication tool, for instance, requires communication (exchange of messages),

coordination (access policies), and cooperation (registration and sharing) (Fuks et al. 2007, p. 637).

When it comes to the benefits and drawbacks of this model, the model helps to identify collaboration through the interplay of communication, cooperation, and coordination.

Therefore, contrary to the time/space taxonomy, there is no necessity to classify groupware technologies only in one category. Also, contrary to the taxonomy of Olson and Olson (2002), the categories are well-established. The smallness or broadness of different categories would create a difficulty in understanding their interplay with each other. The advantage of the 3 C model is that the functional categories are well-distinguished, so it is easy to understand the interaction between these three dimensions. On the other hand, it can be argued that the model restricts itself to the three concepts, namely communication, cooperation, and coordination.

Even though the interplay between them is emphasized, the separation of these three collaboration dynamics may be seen as disconnected to each other. Additionally, the definition of cooperation is problematic because it refers mostly to a shared workspace and the consideration of the distributed team working is thus unclear.

To sum up, the 3 C model has three dimensions. These dimensions are communication, cooperation, and coordination. According to the model, groupware technologies can be classified on the basis of the interplay between these three dimensions. Thanks to this model, it is easy to determine the place of any groupware technologies in between the three dimensions of communication, cooperation, and coordination by looking at the Figure 2.

Nevertheless, the separation of these three dimensions in the 3 C model may sometimes create a difficulty in understanding their interplay with each other.

### **2.2.3. Challenges of Groupware**

There are many challenges of groupware to be mentioned for developers and users. In this regard, eight main challenges of groupware are mentioned in this study. It should be noted

that challenges are specific to a group of people that use groupware. Therefore, unique constellations of these eight challenges can be identified within different groups of people that use groupware. These eight challenges are consisted of a disparity in work and benefit, an insufficient number of people using groupware, a disruption of social processes, the exception handling, the unobtrusive accessibility, the difficulty of evaluation, the failure of intuition, and lastly the adoption process.

A disparity in work and benefit as a first challenge proposes that “groupware applications often require additional work from individuals who do not perceive a direct benefit from the use of an application” (Grudin 1994b, p. 97). Automatic meeting scheduling in electronic calendar systems works when users maintain their personal calendars constantly because a meeting is scheduled on a date that seems to be appropriate for every one (Grudin 1994b, p. 96). If people do not update their personal calendars regularly, the one who sets meetings will be the only beneficiary and the other people will be in a disadvantaged position (Grudin 1994b, p. 96). Thus, groupware technologies necessitate the participation of their users even though direct benefits of these technologies are not understood by all of these users at a first glance.

When an insufficient number of people uses groupware, the second challenge comes to the fore. In such a case, the benefit of using groupware is likely to fail and disappear (Grudin 1994b, p. 97). For example, people can use different word processors in their collaborative study, but these people have to reach a consensus on their co-authoring tool (Grudin 1994b, p. 96). If different co-authoring tools are used by people, none of these tools will be helpful for its users (Grudin 1994b, p. 96). Thus, groupware technologies require a sufficient number of people to be beneficial.

For a disruption of social processes, it can be said that “groupware may be resisted if it intervenes with the subtle and complex social dynamics that are common to groups” (Grudin

1994b, p. 97). The same example of automatic meeting scheduling in electronic calendar systems is given to explain this third challenge. The contribution of automatic meeting scheduling is apparent when it determines a meeting time that seems to be appropriate for everyone. However, regardless of the topic of decision, decision making is a complex issue and users of these calendar systems may hold partially hidden agendas, rely on the knowledge of the other users, and reflect sensitivity to social customs or motivational concerns (Grudin 1994b, p. 97). Therefore, recognizing possible problems resulting from using these technologies seems to be important. Otherwise, the usage of groupware technologies may cause social problems among its users.

When it comes to exception handling as another challenge, it can be emphasized that “groupware may not accommodate the wide range of exception handling and improvisation that characterizes much group activity” (Grudin 1994b, p. 97). Even though error handling, exception handling, and improvisation are characteristics of a group working, many groupware technologies are designed on the basis of standard working procedures (Grudin 1994b, p. 98). Since it is difficult to understand the actual working process of a group of people, groupware technologies remain insufficient to support them in the unexpected situations (Grudin 1994b, p. 98). Therefore, groupware technologies that provide a certain amount of flexibility and a possibility for modification in working procedures are essential for a group activity.

When it comes to unobtrusive accessibility as a fifth challenge, it can be said that an infrequently used groupware technology may require unobtrusive accessibility and integration with more heavily used features (Grudin 1994b, p. 97). As an example, word processors and co-authoring tools are mentioned. Because writing is generally a stand-alone activity, the authors in a collaborative writing project may not want to give up their favorite word processors to use a certain co-authoring tool (Grudin 1994b, p. 99). In this regard, if co-

authoring tools are allowed for unobtrusive accessibility and integration with various word processors at the same time, this groupware technology can be beneficial for all users of a writing project.

A difficulty in terms of an evaluation of groupware creates another challenge. In comparison to single-user applications, it is hard to assess and understand the usability of groupware technologies (Grudin 1994b, p. 100). In this regard, it is necessary to know that evaluation takes time because group collaboration activities unfold over days, weeks or even months (Grudin 1994b, p. 100). Also, it is crucial to admit that groupware evaluation methods are not very precise because they require the information of all users that are involved in the usage of groupware technologies (Grudin 1994b, p. 100). All in all, it should be noted that groupware requires a group of people to work. Therefore, the evaluation of these technologies is an unambiguous and long-term process.

For a failure of intuition, it should be stated that “intuitions in product development are especially poor for multi-user applications, resulting in bad management decisions and an error-prone design process” (Grudin 1994b, p. 97). In this regard, a manager with good intuition can fail to understand the intricate demands on a groupware application that necessitates the participation of a group of people (Grudin 1994b, p. 101). Therefore, getting feedback from a limited number of potential users is not enough for developing groupware applications to appeal to a group of people.

In terms of an adoption process as the last challenge, it should be indicated that “groupware requires more careful implementation in the workplace than product developers have confronted” (Grudin 1994b, p. 97). In this regard, the involvement of product developers with the adoption process can be more important than expected. They can build support for adoption into the groupware technology itself (Grudin 1994b, p. 102). Apart from the involvement of product developers to the adoption process, giving the adopting group a clear

understanding of the mature use of a groupware, providing step-by-step education on especially unfamiliar features, having supportive management attitude, and giving responsibility to someone for premature rejection to anticipate and deal quickly with early problems and for follow-through support are essential (Grudin 1994b, p. 102). Above all, it is important to understand the possible needs of a group of people that will use groupware.

To sum up, eight challenges of groupware are mentioned by considering not only users but also product developers. These eight challenges are related to a disparity in work and benefit, an insufficient number of people using groupware, a disruption of social processes, exception handling, unobtrusive accessibility, a difficulty of evaluation, a failure of intuition, and lastly an adoption process. The specific combinations of these challenges can be the case in different work groups, so appreciating the importance of all these eight challenges are significant.

### **3. THE ROLE OF CULTURE ON GROUPWARE ADOPTION AND DIFFUSION: TRADITIONAL AND NON-TRADITIONAL APPROACHES**

In this chapter, the role of culture on groupware adoption and diffusion is taken into account. Firstly, the importance of culture in groupware adoption and diffusion is assessed. Then, the two fundamental perspectives on culture are defined: culture-as-system and culture-as-practice. However, it is emphasized that the combination of the two concepts provides a better explanation in the adoption and diffusion of groupware. Secondly, traditional approaches to groupware adoption and diffusion are explained. It is said that these approaches prefer the predetermined unit of analysis such as individual, work-unit, organizational or multiple levels (both individual and organizational). Also, how these approaches benefit from the definition of culture is discussed. In this regard, it is mentioned that the individual level of adoption includes two main theories, namely Diffusion of Innovations Theory (including its sub-theories) and Technology Acceptance Model. In addition to the individual level of adoption and diffusion, the work-unit level, organizational level, and multiple levels of adoption and diffusion are evaluated and the examples on these levels of adoption and diffusion are provided. Thirdly, non-traditional approaches to groupware adoption and diffusion are explained. It is underlined that both the Actor-Network Theory and Social Worlds Theory try to assess the dynamic and changing relationship between people and technology in their socio-technical system rather than focusing on a predetermined unit of analysis. Also, how these approaches benefit from the definition of culture is discussed. Last but not least, the combination of the Actor Network Theory and Social Worlds Theory is discussed.

#### **3.1. The Concept of Culture in the Traditional and Non-Traditional Approaches to Groupware Adoption and Diffusion**

Groupware is about the relationship between people and technology. Exploring the role of culture in groupware adoption and diffusion is therefore significant to shed light on the

reasons for adopting or not adopting groupware in a given group of people. As Scalia and Sackmary (1996, p. 100) mentioned, "the use of a groupware tool is based on collective human activity and, as such, its use and value may be directly affected by group interaction patterns, group development processes, participant attitudes, and all the myriad social factors that are found in any work group." However, there are many ways culture is defined. Thus, it is necessary to present the definition of culture that is used in this study. In this regard, the combined perspective of culture-as-system and culture-as-practice is explained in relation to the process of groupware adoption and diffusion step by step.

In terms of definition of culture, there are two fundamental perspectives. The first one is culture-as-system and the other one is culture-as-practice (Sewell Jr. 2005). Sewell argued that these two should not be seen as separate and can be combined together (Sewell Jr. 2005). Therefore, understanding the definitions of both culture-as-practice and culture-as-system is crucial to comprehend the relationship between the combined perspective of these two definitions of culture and the process of groupware adoption and diffusion.

### **3.1.1. Culture-As-System and Culture-As-Practice Perspectives**

Before identifying the combined perspective of culture-as-system and culture-as-practice, their stand-alone concepts should be identified and evaluated in relation to groupware adoption and diffusion.

Firstly, culture-as-system refers to "a whole system of customs, beliefs, norms, habits, myths and so on built by humans and passed on from generation to generation" (Sewell Jr. 2005, p. 80). That is to say, culture-as-system perspective is concerned with the making of meanings (Sewell Jr. 2005, p. 76). The traditional approaches to groupware adoption and diffusion partly or totally benefit from culture-as-system perspective to explain the role of culture through exploring internalized meanings related to groupware and its adoption. These

approaches prefer the predetermined unit of analysis such as individual, work-unit, organizational, or multiple levels (both individual and organizational). Culture-as-system perspective in the predetermined unit of analysis is used to identify the reasons behind the failure or success of groupware adoption and diffusion through exploring internalized meanings toward groupware. To sum up, traditional approaches to groupware adoption and diffusion benefit from culture-as-system perspective.

Secondly, culture-as-practice refers to “a sphere of practical activity in which there are willful actions, power relations, struggle, contradiction, and change” (Sewell Jr. 2005, p. 76). From this perspective, culture is less regarded as an autonomous structure of meaning and is redefined as a performative term (Sewell Jr. 2005, p. 76). The non-traditional approaches to groupware adoption and diffusion take culture-as-practice perspective into consideration to explain the role of culture through exploring practical activities toward groupware by “not excluding culture-as-system perspective”.<sup>2</sup> To sum up, the non-traditional approaches to groupware adoption and diffusion do not solely use culture-as-practice perspective, but use the combined perspective of culture-as-system and culture-as-practice.

In conclusion, the traditional approaches use culture-as-system perspective in the exploration of groupware adoption and diffusion. The non-traditional approaches do not deny the role of culture-as-system perspective and achieve to combine it with culture-as-practice perspective. The detailed information about the combined perspective on culture is presented in the next section.

### **3.1.2. The Combination of Culture-As-System and Culture-As-Practice Perspectives**

The combination of culture-as-system and culture-as-practice perspectives demonstrates two important things. One of them is that these two different perspectives intrinsically supplement

---

<sup>2</sup> In this thesis, Actor-Network theory and Social Worlds Theory are elaborated as non-traditional approaches to groupware adoption and diffusion.

each other. The other one is that this combined perspective makes the non-traditional approaches, particularly Actor-Network theory and Social Worlds Theory, explain groupware adoption and diffusion in a better way than the stand-alone perspectives of culture-as-system and culture-as-practice.

Firstly, studying groupware adoption and diffusion through practical activities (culture-as-practice) can be seen as complementary to studying it through a structure of meanings (culture-as-system). Therefore, these two approaches can be combined in studying groupware adoption and diffusion. For this combined definition, Sewell (2005, p.77) said that culture remains a structure, but is modified in its effects by the contradictory, contested, and constantly changing ways in which it is implemented in practice. By gaining this combined perspective, practical activities that are subjected to contestation and change can be evaluated in relation to a loosely defined system of meanings that are attributed to groupware in the process of its adoption and diffusion.

Secondly, the combined perspective of culture-as-system and culture-as-practice strengthens the non-traditional approaches, particularly Actor-Network Theory and Social Worlds Theory, in explaining groupware adoption and diffusion. These non-traditional approaches give importance to the changing nature of relations between people and technology, so identify these specific relations in their socio-technical system. By Bikson and Eveland (1996, p. 428) and Bostrom and Heinen (1977, p. 14), socio-technical system was defined as:

“A complex whole comprising two interdependent subsystems: a social system people’s attitudes, values, skills, work groups, jobs, task interdependencies, work flow and so forth; and a technical system including, electronic hardware, software, networks, applications, tools, and so on.”

Since these two subsystems are interrelated to each other, changes in one of these subsystems affect the other one. For example, when new technologies are introduced, users may have to learn new work procedures or when pressures for more collaboration become evident, the acquisition of new technologies may be required (Bikson and Eveland 1996, p. 428). In this regard, the combined perspective of culture-as-system and culture-as-practice allow Actor-Network and Social Worlds Theories to elaborate the relationship between people and groupware in their unique socio-technical system.

In conclusion, the combined perspective of culture-as-system and culture-as-practice is beneficial in two respects. Firstly, this combined perspective demonstrates that culture-as-system and culture-as-practice perspectives are complementary to each other. Secondly, the combined perspective gives strength to the non-traditional approaches (the ANT and Social Worlds Theories) by allowing them to explore the relationship between people and groupware in their unique socio-technical system.

### **3.2. Traditional Approaches to Groupware Adoption and Diffusion**

Traditional approaches to groupware adoption and diffusion prefer the predetermined unit of analysis such as individual, work-unit, organizational or multiple levels (both individual and organizational). These traditional approaches partly or totally benefit from culture-as-system perspective to explain the role of culture on groupware adoption and diffusion through exploring internalized meanings related to groupware and its adoption. Culture-as-system perspective is used to identify the reasons behind the failure or success of groupware adoption and diffusion through exploring internalized meanings toward groupware. In this regard, the theories on the individual, work-unit, organizational, and multiple levels of adoption and diffusion are identified in the following sections.

### **3.2.1. Individual Level of Adoption and Diffusion**

As the most widely applied approach, the focus is on the individual as the unit of adoption. In this approach, individual is identified as the main decision-maker in the adoption and diffusion of groupware technologies. The role of culture in the adoption and diffusion of groupware is partly considered and this consideration comes from the supposition that if many individuals in a given organization find a value in adoption groupware together, then this technology can be diffused.

The individual level of adoption includes two main theories, namely Diffusion of Innovations Theory (including its sub-theories) and Technology Acceptance Model. Diffusion of Innovations Theory is mentioned with its four elements, which are innovation, communication channels, time, and social systems. In addition to these four elements, the sub-theories of Diffusion of Innovations Theory, which are innovation decision process theory, individual innovativeness theory, rate of adoption theory, and individual innovativeness theory are explained. After the explanation of these sub-theories of diffusion of innovations theory, Technology Acceptance Model is mentioned with its two determinants, which are perceived usefulness and perceived ease of use.

#### **3.2.1.1. Diffusion of Innovations Theory**

In this theory, diffusion is defined as the process by which “(1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system” (Rogers 1983, p. 10). As is seen, this theory has four elements to explain groupware adoption and diffusion. With these four elements, the theory wants to emphasize that the processes of groupware adoption and diffusion are related to “the degree of perceived compatibility of the innovation to the needs of the users” (Mark and Poltrock 2004, p. 301).

Understanding what is meant by these four elements of innovation, communication channels, time, and social systems is required to understand the sub-theories of the major theory.

Firstly, innovation is defined as “an idea, a practice, or an object that is perceived as new by an individual” (Rogers 1983, p. 11). Therefore, for example, the actual newness of a groupware is not important. The important thing is the perception of this groupware as new by individuals. In this regard, there is a deep focus on the perception of individuals and the ignorance of the role of a group interaction on the adoption and diffusion of groupware.

Secondly, communication channel is defined as “the means by which messages get from one individual to another” (Rogers 1983, p. 17). For instance, communication through TV or through face-to-face exchange can create different effects on the adoption and diffusion of groupware. The nature of a communication channel is therefore seen as significant in the adoption and diffusion of groupware. However, the effect of a group of people on each other in the use of groupware is not questioned specifically in the concept of communication channel.

Thirdly, the concept of time has three different meanings. The first meaning of time is “the innovation decision process by which an individual passes from first knowledge of an innovation through its adoption or rejection” (Rogers 1983, p. 20). The second meaning of time is “the relative earliness/lateness of an individual in the adoption and diffusion of an innovation” (Rogers 1983, p. 20). These two concepts try to shed light on when and how individuals separately decide to adopt groupware after getting knowledge of this specific groupware. In this regard, values attributed to groupware by single users play an important role in the adoption and diffusion of groupware. The third meaning of time is “an innovation's rate of adoption which is measured by the number of members of the system that adopts the innovation in a given time period” (Rogers 1983, p. 20). This concept again evaluates a group

of people as the sum of individuals rather than a complex whole that has an impact on each other in the adoption of groupware.

Lastly, social system is defined as “individuals that are engaged in joint problem solving to accomplish a common goal” (Rogers 1983, p. 24). According to this concept, the attitude or perception of one user toward groupware may cause an effect on another user. In this concept, again, a group of people is seen as the sum of individuals rather than a complex whole that has an impact on each other in the adoption of groupware. However, cultural dynamics in a group of people should not only be restricted to the single users’ attitudes or perceptions.

In short, the four elements of the Diffusion of Innovations Theory (innovation, communication channels, time, and social system) try to persuade that the acceptance of single users is the only determinant of groupware adoption and diffusion. In this theory, individuals may share common ways of thinking, norms, ideas, or perceptions – as explained in concept of culture-as-system. On the other hand, a sphere of practical activity in which there are willful actions, power relations, struggle, contradiction, and change among individuals in the adoption and diffusion of groupware is not elaborated.

#### **3.2.1.1.1. Innovation decision process theory**

Innovation decision process theory is one of the sub-theories of Diffusion of Innovations Theory. According to the innovation decision process theory, the potential users of groupware experience five sequential stages in the adoption and diffusion of a technology. First, these potential users should start to learn about a groupware (knowledge); second, these users should appreciate the value of the groupware (persuasion); these users then should adopt the groupware (decision); the groupware should then be implemented (implementation); and finally, the decision must be accepted or rejected (confirmation) (Rogers 1983, pp. 20–21).

The problem of this sub-theory is that the decision to accept or reject the adoption and

diffusion of groupware is linked to single users' perception of groupware as something valuable after getting knowledge of it.

#### **3.2.1.1.2. Individual innovativeness theory**

Individual innovativeness theory is the other sub-theory of Diffusion of Innovations Theory. Innovativeness is “the degree to which an individual is relatively earlier in adopting new ideas than the other members of a system” (Rogers 1983, p. 22). According to the timing of individuals in the process of adoption and diffusion of groupware, five different categories are formed: innovators, early adopters, early majority, late majority, and laggards (Rogers 1983, p. 2). While individuals under the category of innovators are seen as faster at adopting “newness”, laggards are seen as the later ones at adopting “newness” – groupware in this case. The problem of this sub-theory is that individuals' ability and perception toward adopting groupware is considered separately. The effect of struggles, conflicts, or interdependencies among these individuals in the adoption and diffusion of groupware is not taken into account.

#### **3.2.1.1.3. Rate of adoption theory**

Rate of adoption theory is the third sub-theory of Diffusion of Innovations Theory. This sub-theory explains the diffusion process as a slow and gradual growth period at the first hand (innovators in individual innovativeness theory), a dramatic and rapid growth at the second hand, a gradual stabilization at the third hand, and finally a decline (laggards in individual innovativeness theory) (Rogers 1983, p. 27). Like individual innovativeness theory, the problem of this sub-theory is that it focuses on the decision and perception of individuals separately and remains insufficient to explain the effect of people on each other in the adoption and diffusion of groupware through practical activities like conflict, persuasion, and so forth.

#### **3.2.1.1.4. Perceived attributes theory**

This last sub-theory claims that groupware is adopted and diffused among individuals if these people find a value in adopting this technology. In this regard, the theory proposes five attributes of groupware. These five attributes are relative advantage, compatibility, complexity, trialability, and observability.

Relative advantage refers to “the degree to which an innovation is perceived as better than the idea it supersedes” (Rogers 1983, p. 15). Therefore, the important thing is the perception of a groupware as relatively advantageous, not the objective consideration of this groupware on the basis of whether or not it is better than the old way of working.

Compatibility refers to “the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters” (Rogers 1983, p. 15). The concept of culture-as-system is especially essential to this second attribute of groupware. If a groupware is incompatible with the existing belief system of a given group of people, then this groupware is unlikely to be adopted. Even though the significance of the belief system in process of groupware adoption and diffusion cannot be denied, the practical sphere in the everyday working life is also significant but not taken into consideration in this sub-theory.

Complexity refers to “the degree to which an innovation is perceived as difficult to understand and use” (Rogers 1983, p. 15). If individuals find a groupware easy to use, then it is likely to be adopted by these individuals. Nevertheless, the decision on whether or not a groupware is complex can also be determined by interdependencies or conflicts among individuals. In this regard, this sub-theory is not enough to explain the reasons for deciding whether or not a groupware is complex.

Trialability refers to “the degree to which an innovation may be experimented with on a limited basis” (Rogers 1983, p. 15). If a belief system of a given group of people does not

include “living with uncertainties”, “newness and unexpectedness of a groupware” may cause oppositions from these people. Even though a belief system of a given group is important to explain the reasons behind why a groupware is adopted or not adopted, looking only at the belief system prevents to see the impact of everyday practices of these people in their adoption and diffusion of groupware.

Observability refers to “the degree to which the results of an innovation are visible to the others” (Rogers 1983, p. 16). If users do not have to wait long time for seeing its benefits, then it can be easily adopted by the observers of this process. It can be said that this fifth attribute of groupware is appropriate for not only culture-as-system but also culture-as-practice. The spread of a groupware among people is dependent on both the perceived benefits of a groupware and the process of observation and persuasion.

In conclusion, there are five attributes of groupware to be mentioned. These are relative advantage, compatibility, complexity, trialability, and observability. In this sub-theory, these five attributes are strongly linked to the belief system of individuals. On the other hand, the practical sphere of everyday working life and the nature of group work are generally ignored. Therefore, the failure and success of groupware adoption and diffusion are related to the decision of single users.

### **3.2.1.2. Technology Acceptance Model**

Apart from diffusion of innovations theory, TAM is the other well-known theory that focuses on individual as the unit of adoption. In line with the Diffusion of Innovations Theory, TAM also gives importance to the perceptions, norms, beliefs and ideas of single users in the process of groupware adoption and diffusion. In this regard, there are two determinants of groupware adoption and diffusion: perceived usefulness and perceived ease of use

Perceived usefulness refers to “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis 1989, p. 320). Therefore, if an individual believes that he or she will perform a better job by using a groupware, this person will more likely to adopt this groupware technology. The perception of these single users in terms of usefulness plays a prominent role in their adoption and diffusion of groupware.

Perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort” (Davis 1989, p. 320). Thus, to adopt groupware, individuals should think that the use of a groupware will require less time and less effort than the old way of working. The perception of these individuals in terms of ease of use plays prominent role in their adoption and diffusion of groupware.

To sum up, TAM proposes two determinants in the adoption and diffusion of groupware.

These two determinants are perceived usefulness and perceived ease of use. As in the case of Diffusion of Innovations Theory, TAM also claims that the decision to adopt or not to adopt groupware is dependent on single users and their perception.

### **3.2.2. Work-Unit Level of Adoption and Diffusion**

In addition to the individual level of adoption and diffusion, the work-unit level of adoption and diffusion is also widely preferred in the studies of groupware adoption and diffusion. In this regard, it is assumed that the investigation of work-units is sufficient at explaining differences among people in terms of groupware adoption and diffusion at companies.

Nevertheless, interdependencies between work-units are not taken into account in these studies (Mark and Poltrock 2004, p. 301). The role of culture in the work-unit level of analysis comes from the supposition that work-units (e.g., marketing department, IT department, human resources department) are homogenous units to reveal and explain values attributed to groupware.

To exemplify the use of work-units as the unit of analysis in groupware adoption and diffusion, the studies of Huang et al. (2003) and Von Meier (1999) are explained in detail. Huang et al. (2003) explored the conflicting values among the different work-units (front office and back office personnel) at the implementation of a component based technology to increase integration and collaboration between work-units at InveBank. Von Meier (1999) evaluated the competing values among different work-units (engineers and operators) at the US electric utility companies at the implementation of an innovative technology on distribution automation. In these two studies, the failure to adopt and diffuse groupware at the company was explored by looking at the incompatible sets of values attributed to this collaborative technology by the different work-units.

### **3.2.2.1. Examples on Work-Unit Level of Adoption and Diffusion**

Both Huang et al. (2003) and Von Meier (1999) assumed that work-units are homogenous and their willingness or unwillingness to adopt a technology comes from the shared ideas and common ways of thinking toward this new technology at the different work-units. In this sense, the authors of these two studies benefit from the culture-as-system perspective to a great extent.

Huang et al. (2003) focused on front-office and back office personnel to reveal their conflicting values attributed to a component-based development – which allows for the integration of IT processes between these two work-units at InveBank (Huang et al. 2003, p. 89). Firstly, the front-office personnel desire for the use of this integrative technology. As traders, the front office personnel see a value in the use of this technology that enables a faster IT process (Huang et al. 2003, p. 96). In contrast to the front-office personnel, the back-office personnel do not desire for the use of this integrative technology. The job role of the back-office personnel does not demand for a continuous change and they want to concentrate on

centralizing all regional trading settlements to ensure better control (Huang et al. 2003, p. 94). In short, a desire to improve IT processes and a concern to improve control create two opposing views toward the adoption and diffusion of the technology.

Von Meier (1999) focused on engineers and operators to show their competing perspectives on distribution automation – which allows for variety of techniques for increasing the speed and scope of operations through an electronic and computer-driven equipment in place of manual procedures (Von Meier 1999, p. 102). Firstly, the engineers desire for the use of this technology because the technology enables the engineers “to cite the specifications and performance record of a particular control mechanism and assert that it meets all standards for reliable operation when it comes to automation schemes” (Von Meier 1999, p. 109). In contrast to the engineers, the operators do not desire for the use of distribution automation. Operators think that automation schemes that are proposed by the engineers are practically neither applicable nor reliable and dependent only on a hypothetical scenario (Von Meier 1999, p. 102). In short, a desire to improve the theoretical accuracy of automation schemes and a concern to maintain the reliable applicability of operations create two opposing views toward the adoption and diffusion of the technology.

In conclusion, both Huang et al. (2003) and Von Meier (1999) benefited from the culture-as-system perspective to conduct their studies. Therefore, their definition of culture was limited to perceptions, beliefs, and values attributed to the collaborative technologies within different work-units. Therefore, one can question the effect of the different work-units on each other (conflict, persuasion, competition) in the adoption and diffusion process of these technologies. In this regard, these two studies actually illustrate the insufficiency of the stand-alone use of the culture-as-system perspective in explaining the failure or success of groupware adoption and diffusion at companies.

### **3.2.3. Organizational Level of Adoption and Diffusion**

Models where the organization is the unit of analysis are concerned with how the organizational norms influence groupware adoption and diffusion. In this regard, the culture-as-system perspective is used in the sense that organizational making of meanings attributed to groupware is sufficient enough to explain its adoption and diffusion.

To exemplify the use of organizations as the unit of analysis in groupware adoption and diffusion, the studies of Orlikowski (1992) and Ruppel and Harrington (2001) are explained in detail. Orlikowski (1992) revealed that the competitive individualism at Alpha Corporation, which is a large services firm, prevents the adoption and diffusion of Notes to make it Alpha's communications standard. Ruppel and Harrington (2001) found out that the ethical and developmental culture at the US companies support intranet implementation. By focusing on shared norms, perspectives, ideas, and so forth, both of the studies used the culture-as-system perspective.

#### **3.2.3.1. Examples on Organizational Level of Adoption and Diffusion**

Both Orlikowski (1992) and Ruppel and Harrington (2001) assumed that organizational culture is the determinant for the willingness or unwillingness of people to adopt groupware technologies. In this sense, the authors of these two studies benefited from the culture-as-system perspective to a great extent by exploring shared norms, mental recognitions, ideas, and perspectives toward groupware technologies at companies.

Orlikowski (1992) conducted the study on the adoption and diffusion of Notes at Alpha Corporation, which is a large services firm. It is stated that like many other consulting firms, Alpha supports the competitive individualism which reinforces individual effort and ability and does not strengthen collaboration and sharing of expertise - are actually the underlying premise of groupware technologies (Orlikowski 1992, p. 367). Notes is mainly used to

increase individual productivity because people think that giving specialized knowledge to the other people may cause the loss of distinctive competence for themselves (Orlikowski 1992, p. 367). In short, the competitive individualism at the company negatively influences the adoption and diffusion of Notes as a collaborative technology.

Ruppel and Harrington (2001) conducted the study on the adoption and diffusion of Intranet at various US companies. It is stated that the use of Intranet is related to an organizational culture that gives importance to trust and concern for others (ethical culture) and flexibility and innovation (developmental culture) (Ruppel and Harrington 2001, p. 37). In terms of ethical culture, organizations that encourage “a caring, trusting environment”, while discouraging “self-interests”, would be more likely to adopt and diffuse intranets successfully (Ruppel and Harrington 2001, p. 43). In terms of developmental culture, organizations that support “adaptation to new things and change” and “commitment to innovation and development for the tasks undertaken”, while discouraging “being reactive to the flourishing of new ideas” would be more likely to adopt and diffuse intranets successfully (Ruppel and Harrington 2001, p. 41). In short, it is said that ethical culture and developmental culture maintain and reinforce certain norms that allow organizations to achieve for groupware adoption and diffusion.

In conclusion, Orlikowski (1992) and Ruppel and Harrington (2001) used organizations as the unit of analysis in groupware adoption and diffusion. In this regard, the assumption is that organizational norms play an important role in the adoption and diffusion of groupware technologies. Because the daily acts of people toward groupware were not elaborated at these organizations, these studies remain insufficient in presenting a broader picture for groupware adoption and diffusion.

#### **3.2.4. Adoption and Diffusion at Multiple Levels**

Hybrid models presuppose that adoption and diffusion of groupware occur at the multiple levels of an organization in a stage process. It is claimed that the solely use of individual, work-unit, or organizational models deny the realities of adopting and diffusing groupware within organizations. Therefore, the aim of these hybrid models is to integrate the factors from the other traditional model studies of groupware adoption and diffusion into the studies at multiple levels. In this regard, the culture-as-system perspective used in the sense that none of the unit of adoption at the different levels of an organization is sufficient to explore a structure of meanings associated with groupware. Therefore, these units of adoption are combined to account for groupware adoption and diffusion.

#### **3.2.4.1. Example on Adoption and Diffusion at Multiple Levels**

To exemplify the use of multiple levels as the unit of analysis in groupware adoption and diffusion at companies, the study of Gallivan (2001) is explained in detail. Gallivan (2001) conducted the study on groupware adoption and diffusion at Insureco – one of the ten largest U.S. life insurance firms – which tried to adopt and diffuse client/server development process among the company’s IS employees in the years between 1992 and 1995 (Gallivan 2001, p. 66). Client/server development allows “a new software development process” that switches “mainframe computers to distributed network-based systems as the platform for developing and running application systems” (Gallivan 2001, p. 64). The adoption and diffusion of client/server development demand a more customer-engaged job role among the IS employees by developing their business knowledge and their relationship with business users (Gallivan 2001, p. 72). There are two steps to be identified in the adoption and diffusion of client/server development: the primary adoption and the secondary adoption (the diffusion process).

The first adoption is divided into two processes by the author. The initial process refers to the IS managers’ initial decision to adopt client/server development. The later process looks at the

impact of three factors on the adoption and diffusion of client/server development. These three factors are managerial interventions, subjective norms, and facilitating conditions. Managerial interventions refer to “the actions taken and resources made available by managers to expedite secondary adoption, including mandating usage” (Gallivan 2001, p. 61). Subjective norms refer to “individuals' beliefs about when and why to adopt an innovation, how much effort to undertake on their own to learn it, or when to abandon the technology for an even-newer innovation” (Gallivan 2001, p. 61). Lastly, facilitating conditions refer to a broad category that “captures other factors that can make implementation more- or less-likely to occur such as the attributes of the innovation, the organization or the work task itself” (Gallivan 2001, p. 61). All in all, the main focus of the first adoption is on how this new technology is perceived. The linkage between the perception of this technology and the practical sphere – such as persuasion, contestation, and discussion regarding the new technology – is not identified.

The secondary adoption (the diffusion process) refers to “an adoption at the individual level” (Gallivan 2001, p. 62). Because the adoption of the technology is already supposed, the influence of managerial interventions, subjective norms, and facilitating conditions on the experiences and obstacles that are faced by the IS employees in the diffusion process are discovered in general. To sum up, the secondary adoption assesses the individual IS employees as the passive recipients in the adoption and diffusion of groupware. The meaning and importance given by the management are seen as significant.

The result of the study at Insureco presented that managerial intervention has the most notable contribution throughout the second adoption. The support from the management and the allocation of heavy resources not only affect the secondary adopter's perception of the management's commitment to this initiative but also provide necessary resources for managers to implement the technology in a top-down manner through various trainings and

workshops (Gallivan 2001, p. 73). Subjective norms and facilitating factors have minor contributions on the secondary adoption in the either early or late stages of the secondary adoption (Gallivan 2001, p. 74). That is to say, even though this study aimed at combining the various traditional unit of analyses, the ultimate model shows that how managers and then the IS employees value the new technology is important in the adoption and diffusion of the technology.

In conclusion, Gallivan (2001) considered two main processes: the initial adoption and the secondary adoption by looking at organizational and work-unit level of analyses in the primary adoption and individual level of analysis in the secondary adoption. In this way, the author attempted to escape from the certain pitfalls of choosing one unit of analysis.

Nevertheless, it should be noted that the focus of the study is on the meanings and importance given by the different levels at the organization. The study is insufficient to explore practices and actions that are realized due to the structure of meanings related to client/server development at Insureco.

### **3.3. Non-Traditional Approaches to Groupware Adoption and Diffusion**

Non-traditional approaches in groupware adoption and diffusion look beyond traditional units of analysis. The aim in these studies is to assess the dynamic and changing relationship between people and technology in their socio-technical system. By combining the perspectives of culture-as-system and culture-as-practice, practical activities that are revolving around the relations among people and technology can be evaluated in a loosely defined system of meanings that are attributed to groupware in the process of its adoption and diffusion. In this regard, the Actor-Network Theory and the Social Worlds Theory are identified in the following sections.

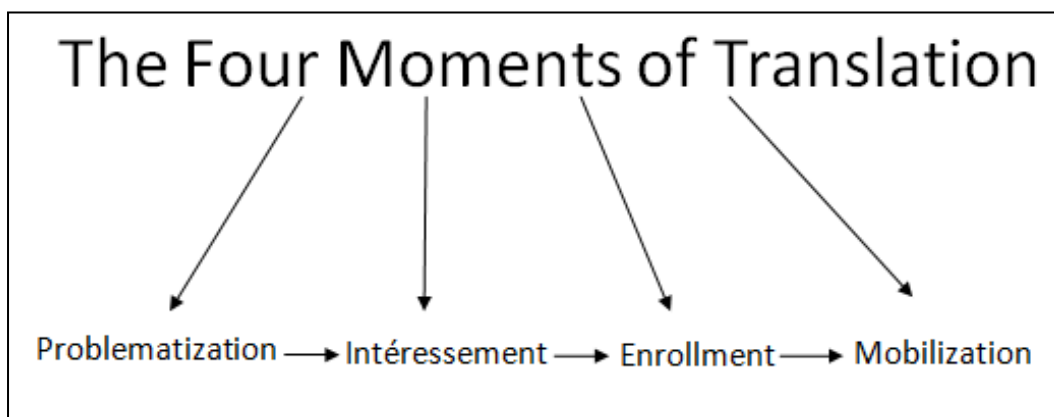
### **3.3.1. Actor-Network Theory**

The first approach that is identified in terms of non-traditional approaches is Actor-Network Theory. This theory was developed in the 1980s by Callon and Latour and bases its roots in French philosophy (Rhodes 2009). To understand the ANT, it is important first of all to comprehend its perspective and key concepts. The ANT attributes important roles to both animate and inanimate actors, focuses on the processes of translation, and lastly considers both practical activities and internalized meanings as significant.

Firstly, the theory focuses on all actors regardless of animate or inanimate actors because the formation of the aligned networks does not belong only to people and belong actually to the relationship between all animate and inanimate actors. According to the ANT, “Actor/actant refers to either human or nonhuman entities.” and “An actor world only exists in context and in juxtaposition to other actors and the number of connections that an actor has with different networks determines what the actor is and what he, she, or it can do, as configured by a series of negotiations.” (Rhodes 2009, p. 4) Because the theory emphasizes the relationship between actors to a great extent, the other concept, actor networks, occupies an important place in the theory. According to the ANT, actor networks involve various groups of heterogeneous animate and inanimate elements linked to each other over time (Rhodes 2009, p. 4). To sum up, actor and actor networks are the two important concepts of the ANT.

Secondly, the theory focuses on processes of translation “in order to trace and explain the processes whereby stable networks of aligned interests are created and maintained” (Rhodes 2009, p. 4). In this regard, there are four moments of translation proposed by the ANT to explain how the interests of both animate and inanimate actors come and move together. Translation refers to the strategic processes in which the actor network describes itself irreplaceable through negotiation, persuasion, seduction, simple bargaining, and violence (Rhodes 2009, p. 5). The translation of an actor or actors into actor networks is realized

through four moments of translation: Problematization, Intéressement, Enrollment, Mobilization (Rhodes 2009, pp. 6-7). The moment of problematization refers to a process in which “an actor or actors defines the problems so that other actors recognize it as their own problems.” (Rhodes 2009, p. 6) The moment of intéressement refers to a process in which “actors convene around an issue to strengthen their determination toward moving together.” (Rhodes 2009, p. 6) The moment of enrollment refers to a process in which “the success problematization and intéressement is strengthened through constant attention, such as using humans and machines (Internet, telephones) TV, to enroll actors.” (Rhodes 2009, p. 6) The last moment of mobilization refers to a process in which “the continuity of the actor network is dependent on maintaining the network by persuading the actors that their interests are the same as the remaining network.” (Rhodes 2009, p. 6-7) The creation and recreation of these processes are essential to the development and maintenance of the interests of actor networks.



**Figure 3:** The Four Moments of Translation (Rhodes 2009, p. 6)

Last but not least, the ANT focuses on both practical activities and internalized meanings as significant. In this regard, the ANT looks at the attempt of actors to impose worlds upon one another and to describe the dynamics and internal structures of actor worlds” (Rhodes 2009, p. 4). All in all, both practical activities, such as persuasion or struggles, and internalized meanings of actors are taken into consideration.

In summary, the ANT gives importance to the aligned interests of actors. Therefore, the theory tries to identify how the creation and recreation of these alignments occur. Besides, the combination of culture-as-system and culture-as-practice is perfectly used since not only internalized meanings or practical activities but both of them are essential in the theory.

### **3.3.1.2. Actor-Network Theory in Groupware Adoption and Diffusion**

The ANT differentiates itself from traditional theories on groupware adoption and diffusion. In this regard, the ANT's unit of analysis, definition of groupware adoption and definition and lastly, differences from traditional theories on groupware adoption and diffusion should be assessed.

In terms of unit of analysis, the ANT does not provide a certain distinction on the basis of individual, departmental or organizational level. The ANT evaluates actors and their aligned networks in a coherent way. Therefore, it cannot be denied that the ANT does not concern so much with "the unit of analysis" like traditional theories on groupware adoption. In some cases, the translation process in groupware adoption and diffusion process may look at individuals, departments, or organizations at the same time, but this preference is not determined before. In short, there are actors and their networks playing their significant role in groupware adoption and diffusion.

In terms of the definition of groupware adoption and diffusion, the ANT with a theory of innovation translation depends its explanation on a process of network formation among actors to persuade others to become their allies in promoting the acceptance of their own view of the way (Tatnall and Gilding 1999, p. 963). Thus, it can be said that groupware adoption and diffusion of groupware come as a result of the actions of actors who has anything to do with it (Tatnall and Gilding 1999, p. 960). All in all, the ANT is not result-oriented. This theory,

whether or not a specific technology is accepted by a given group of people, looks at actor-shaped processes.

What differentiates the ANT from traditional theories on groupware adoption and diffusion?

Firstly, the traditional theories with individual, work-unit or organizational unit of analysis explain groupware adoption and diffusion by relying on the specific characteristics of the change agents. However, according to the ANT, none of the traditional units of analysis is sufficient enough to explain groupware adoption and diffusion among a given group of people. This theory points out that neither individuals nor organizations are solely able to spread the use of a given technology among this given group of people. Secondly, the traditional theories rely on the supposed meanings of the innovation itself. This situation prevents to evaluate the changing meanings of this innovation over time among a given group of people. However, the ANT, in the adoption and diffusion of a certain chat application in a company, may evaluate and combine the usage level of the computers at the company, the technology magazines at the departments, the people who like this type of applications at the company, the people who do not like this type of applications at the company, the personal use of chat applications via phone/computer/notebook, the approach of people to the introduction of new technologies, the understanding of people toward to the use of chat applications, the strategies of these people to use or not to use these applications and so forth.

In conclusion, the ANT wants to get a more comprehensive picture in the adoption and diffusion of groupware than the traditional theories. Therefore, actors and their aligned networks can be considered as the unit of analysis. Besides, the consideration of processes rather than the superficial analysis on the supposed features of an innovation and the supposed characteristic of change agents is crucial for the ANT.

### **3.3.2. Social Worlds Theory**

The second approach that is identified in terms of non-traditional approaches is Social Worlds Theory. This theory was developed in the 1960s by an American sociologist Anselm Strauss (Clarke 1991). The Social Worlds Theory shares a lot of common features with the Actor Network Theory. To understand the Social Worlds Theory, it is important first of all to comprehend its perspective and key concepts. Therefore, “the concept of social worlds”, “the concepts of action and change”, and “the role of culture” are taken into account.

Firstly, the Social Worlds Theory establishes its basis on the concept of social worlds. Social worlds refers to “the groups with commitments to certain activities, sharing resources of many kinds to achieve their goals and building ideologies about how to go about their business” (Clarke 1991, p. 131). In this regard, it can firstly be said that the concept of “social worlds” is similar to the concept of “aligned networks” in the ANT. While the ANT prefers to look at “the actors” from the very beginning of “the translational process”, the Social Worlds Theory prefers to look at “the people” after they form their “social worlds”. Also, while the ANT considers the role of “both animate and inanimate creatures” in the aligned networks, the Social Worlds Theory generally considers the role of “human beings”. In short, both the ANT theory and Social Worlds Theory gives importance to grouping and alignment.

Secondly, the concepts of action and change have a significant role in the Social Worlds Theory. In the theory, the concepts of action and change can be explained by identifying how social worlds act “to make a difference to further their agendas” and “to enhance their positions in relation to other worlds” (Clarke 1991, p. 138). Therefore, the structure of social worlds can be identified as “highly fluid, overlapping, cross-cutting and even conflicting” (Clarke 1991, p. 133). Through the realization of actions and changes, social worlds shift as patterns of commitment alter, re-organize and re-alter (Clarke 1991, p. 133). All in all, the concepts of action and change are similar to the concept of action in the ANT. Both of the

theories point out the importance of practical activities to create and maintain certain commitments through negotiation, persuasion, or discussion.

Lastly, the concept of culture can be evaluated to gain a broader picture in the Social Worlds Theory. Like the ANT, the Social Worlds Theory focuses on both practical activities and internalized meanings as significant. In their social worlds, people may have certain internalized meanings, but participating, working, or struggling can make these meanings valuable. Therefore, the combination of culture-as-system and culture-as-practice can be seen in the Social Worlds Theory.

### **3.3.2.1. Social Worlds Theory in Groupware Adoption and Diffusion**

The Social Worlds Theory is complementary to the ANT in the process of groupware adoption and diffusion in various ways. Both the similarities and differences of these two theories play an important role in their harmony. In this regard, the Social Worlds Theory's unit of analysis, definition of groupware adoption and definition and lastly, combination with the ANT are evaluated.

In terms of unit of analysis, the Social Worlds Theory identifies social worlds as the unit of analysis in groupware adoption and diffusion. Social worlds is described as “the groups with commitments to certain activities, sharing resources of many kinds to achieve their goals and building ideologies about how to go about their business” (Clarke 1991, p. 131). What are the main properties of social worlds exist in organizations? Firstly, it can be said that “social worlds are diverse” because every social group include the unique constellation of people, experiences, conditions and responsibilities (Mark and Poltrock 2003, p. 285–286). Secondly, it can be emphasized that “people belong to multiple social worlds” because people are involved in different social worlds by the constant switch of their activities and roles (Mark and Poltrock 2003, p. 286). For example, a person can be an employee at the company, an

engineer at the department, a friend in the company's cafeteria, a presenter in the meeting and so forth. Thirdly, it can be pointed out that “communication channels can vary across social worlds” because the alteration of conditions, activities, tasks and roles require the use of different communication channels (Mark and Poltrock 2003, p. 286). Last but not least, “each social world has its own state of readiness for technology” because many factors like the experiences of members, available resources, and management policies can affect the readiness for a given technology (Mark and Poltrock 2003, p. 286). All in all, “social worlds” as the unit of analysis allows for the identification of people in a comprehensive way.

The Social Worlds Theory defines groupware adoption and diffusion as “the spread of a groupware technology within and between social worlds” (Mark and Poltrock 2003, p. 285). In this sense, it is stressed that groupware adoption and diffusion can be increased to the extent that people introduce it to their social worlds. In short, the persuasion of people to use of groupware is linked to their interaction and relation with the other people.

Thirdly, the Social Worlds Theory is complementary to the ANT in various ways. Firstly, both of the theories give importance to a relation between people and technology. In this regard, the ANT complements the Social Worlds Theory by increasing the importance of technology as an actor in the adoption and diffusion of groupware. On the other hand, the Social Worlds Theory complements the ANT by maintaining and not distracting attention on people in the adoption and diffusion of groupware. Secondly, both of the theories give importance to alliance. In this regard, the ANT complements the Social Worlds Theory by exploring the linkages between actors in detail - which can be uncontrolled at times. On the other hand, the Social Worlds Theory complements the ANT by providing specificity to the boundaries of social worlds and pointing out that people can be involved in different social worlds simultaneously. Lastly, both of the theories try to make sense of groupware adoption

and diffusion not only structurally but also relationally through shared commitments, negotiation, persuasion, discussion, competition and so forth.

To sum up, the Social Worlds Theory's unit of analysis, definition of groupware adoption and definition and lastly, combination with the ANT were identified. The theory uses “social worlds” as the unit of analysis by underlining that people can be a part of different social worlds and defines “groupware adoption and diffusion” as “the dispersion of a groupware technology among these social worlds”. Lastly, it can be said that the ANT and the Social Worlds Theory are complementary to each other due to not only their similarities but also their differences.

#### **4. RESEARCH METHODOLOGY**

Nowadays, there are many collaborative technologies in the market. While there are endless opportunities in terms of the functions these technologies possess, the success of the technology is especially dependent on the extent it is adopted and diffused within an organization. In this regard, a non-governmental organization - the Educational Volunteers Foundation of Turkey wanted to detect the reasons behind the disuse of a groupware technology – Chatter. This groupware technology introduced to the organization a few years ago, but the mutual adoption and diffusion have not been realized since then.

By benefiting from the explanatory power of the combined approach of culture-as-practice and culture-as-system perspectives in the first place and the combined approach of the Actor-Network Theory and the Social Worlds Theory in the second place, the aim of study emerged as the exploration of cultural factors that prevent groupware adoption and diffusion at a non-governmental organization. In the section of research questions, the research questions that were asked to interviewees are evaluated. In the section of setting and history, the history of TEGV and the features of Chatter are identified. In the section of sample and data collection method, why, with whom, and how interviews were conducted are identified. In the section of research methodology, the theoretical background of the study and the coding processes are identified.

##### **4.1. Research Questions**

The aim of this study was to explore cultural factors that prevent groupware adoption and diffusion at non-governmental organizations. The combination of the Actor-Network Theory and the Social Worlds Theory as a theoretical background necessitated a detailed understanding of people at these non-governmental organizations toward the use of groupware. Therefore, open-ended questions were asked to interviewees at one of the non-

governmental organizations in Turkey, namely Educational Volunteers Foundation of Turkey (TEGV). The TEGV management wanted to use Chatter for an organizational collaboration tool. Despite this technology was introduced to the organization a few years ago, the use of Chatter has not been widespread. To learn about the cultural factors that prevent the use of the technology at the organization, the below questions were asked to the respondents. If required, the additional questions were asked to clearly comprehend what was meant by the respondents.

- **What is the current organizational structure at TEGV?**

This question was asked to explore how people are connected to each other at the organization and to comprehend whether or not there is a centralized management.

- **How do you take part in the formation and application of educational programs?**

This question was asked to understand the responsibilities of people and the role of collaboration at the organization, to realize the perspective of people toward each other, and to discover whether or not there is a dichotomy between the local teams and the management.

- **What do you expect from a collaborative technology?**

This question was asked to understand the needs of people at the organization from a collaborative technology and to compare these expectations with the perceived features of Chatter.

- **Do you think Chatter have any advantages?**

This question was asked to explore how Chatter is perceived and to realize whether or not Chatter has any benefits.

- **If yes, what are the advantages of using Chatter at work?**

This question was asked to comprehend the motivational reasons to adopt and diffuse Chatter to the other people at the organization. The answers that were given to this question were important because the reasons for the preference of Chatter can be determined. These reasons can be focused to attract the attention of more people at TEGV.

- **Do you think Chatter have any disadvantages?**

This question was asked to explore how Chatter is perceived and to realize whether or not Chatter is seen as inadaptable and useless.

- **If yes, what are the disadvantages of using Chatter at work?**

This question was asked to comprehend the demotivational reasons to adopt and diffuse Chatter to the other people at the organization. The answers that were given to this question were important because the reasons for the dispreference of Chatter can be determined. To solve these problems can create a possibility to motivate people to adopt and diffuse Chatter at the organization.

- **How can these disadvantages be eliminated?**

This question was asked to understand how the demotivational reasons to adopt and diffuse Chatter can be eradicated. In this regard, the suggestions of people at TEGV are significant to realize their way of looking at the solution of the problems regarding the adoption and diffusion of Chatter.

## **4.2. Setting and History**

### **4.2.1. TEGV**

The interviews took place at the headquarter of TEGV and İpek Kır aç Learning Unit in İstanbul between April and May, 2015. Firstly, to recognize TEGV in a better way, its history, its purpose, its educational approach and the educational units are mentioned.

TEGV was established on January 23, 1995 by Suna Kır aç - who is now honorary president of the organization - and a group of businessmen and academician as a non-governmental organization in Turkey. Throughout the years, TEGV has been one of the most widespread educational organization in Turkey (TEGV, Tarih e).

The main purpose of TEGV is to give educational support to the primary school students. TEGV tries to achieve its goal by implementing the unique education programs through volunteers and spreading its education units all over Turkey. These educational units consist of Education Parks, Learning Units, and Firefly Mobile Learning Units (TEGV, TEGV Hakkında).

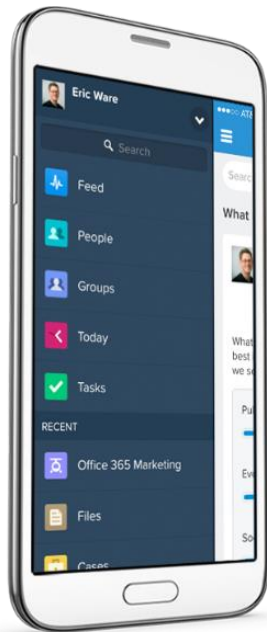
The educational model of TEGV should be examined in three parts. Firstly, in terms of education, TEGV wants to provide primary school students with the necessary knowledge, skills and values through various types of educations. These activities include Educational Programs, Short-Term Activities, Club Activities, and School-Support Programs. Secondly, in terms of volunteering, TEGV is in an attempt to have volunteers who adopt the approach of TEGV, who love children as individuals, who show respect and interest to children, and who are socially responsible. All types of educations are implemented by volunteers at TEGV; therefore, these people do not only give education at TEGV but also increase the awareness towards non-governmental organizations in Turkey. Thirdly, in terms of education units, TEGV wants to create spaces that are colorful, encourage creativity, have learning opportunities, and be eligible for the effective use of technology. There are three educational units: Education Parks, Learning Units, and Firefly Mobile Learning Units (TEGV, Eđitim Modeli ve Yaklařımımız). Education Parks have the largest area and educational

opportunities for children. These parks have 10 activity rooms, 2 computer rooms, 1 library, and some special studios and are available to 3500 children. Education Units are present in the provinces and districts that have limited educational opportunities. These units have 4 activity rooms, 1 technology room, and 1 library and are available to 700 children. Firefly Mobile Learning Units reach children who have no access to Education Parks and Education Units. These trucks have 1 technology room, 1 activity room, and a living space and reach 2400 children within one year (TEGV, Etkinlik Noktalarımız).

All in all, TEGV was established and has turned into one of the most widespread educational organization in Turkey. The aim of TEGV is to give educational support to the primary school students. Lastly, the educational model of TEGV should be examined in three parts:

Education, Volunteers, and Educational Units.

#### 4.2.2. Chatter



**Figure 4:** The representative image of Chatter as mobile

Chatter is a cloud-based collaborative technology and was introduced to TEGV in 2014. The reason for introducing Chatter was to support participation in the formation and execution of education programs and to encourage communication and collaboration within TEGV. Chatter has not been widely and actively used since 2014 despite of the trainings that were given to the people at TEGV. Nowadays, there are more than 50000 volunteers of the organization, but the number of active users of Chatter is still very low. To explore the causes that have prevented the adoption and diffusion of Chatter at the organization, it is important to know the key features of Chatter. There are three main features of Chatter.

Firstly, Chatter enables people to work easily across organizational boundaries. In this sense, people can create support cases, approve project funds, connect data to internal systems via Chatter. Also, Chatter is compatible with mobile phones, so people can post to a group or download a file after downloading the app (Chatter, Features). In the case of TEGV, it is useful to get access to Chatter through mobile phones because between the local units and the management, it could help to create more strong links through communication and cooperation.

Secondly, Chatter provides collaboration by ensuring that the best ideas always come to light. In this sense, people can create groups and share files and keep up with projects, topics, and teams from the feed on Chatter. Also, Chatter allows posting a poll to a group for feedback on a specific subject. Moreover, Chatter collects the most up-to-date content from Chatter discussions and structures answers to common questions so people can find the information they need (Chatter, Features). At TEGV, people are in touch with the people within their own working environments. However, the use of Chatter could make these people consult the management or the other local units on any issues in a very short time.

Thirdly, Chatter encourages knowledge-sharing among people at organizations. In this sense, Chatter gives people incentives to join the conversation through contribution scores, while badging and endorsements highlight the key contributors. Also, Chatter uses personal data on the basis of interests and activities to form a personalized feed and profile page in terms of subjects, projects and so forth (Chatter, Features). In this regard, people of TEGV from all over Turkey could have a chance to know each other and share their knowledge any any specific subjects.

If Chatter is identified in relation to the taxonomies of groupware, it is difficult to find a place for this technology to be categorized. Particularly the Classification in terms of Time and Space and Olson and Olson's Taxonomy do not emphasize the integrated functions of

groupware in detail. On the other hand, the 3 C Model is more useful to categorize Chatter. In the interplay of communication, cooperation and coordination, Chatter could be evaluated within the dynamics of communication. Since there are many distributed local units within the organization, the realization of cooperation and coordination could be harder, but also not impossible.

In short, there are three main features of Chatter. One of them is Chatter enables people to work easily across organizational boundaries. Second of them is Chatter provides collaboration by ensuring that the best ideas always come to light. Lastly, Chatter encourages knowledge-sharing among people at organizations. In terms of the 3 C Model, Chatter could be categorized within the dynamics of communication, but coordination and cooperation through Chatter could also be possible at TEGV.

#### **4.3. Sampling and Data Collection Method**

Firstly, the interviewees at TEGV are briefly identified and the interview process with them is elaborated. Then, the reasons behind why interview was selected as a data collection method are explained. In this sense, two main reasons were assessed.

When it comes to interviewees, maximum variation in terms of sample both from the management and the local units was important for the understanding of different perspectives on the adoptional difficulties of Chatter. In the beginning of the interviews, the aim of the study was shared with the respondents and the consent of these respondents to join the study was taken. Two people from the TEGV management, six people from İpek Kıraç Learning Unit, and one parent and her child attending TEGV were interviewed. These interviews took place at the headquarter of TEGV and İpek Kıraç Learning Unit in İstanbul between April and May, 2016. It should be noted that even though the participation of four people from the local unit to the interview was higher due to their experience for years at TEGV, the participation

of the other two from the local unit was lower due to their inexperience. However, their thoughts on social media was very beneficial. Besides, it was not easy to have a talk with the parent and her child about Chatter because they did not have enough knowledge about Chatter. Therefore, “what-if” questions were asked to let them talk in terms of Chatter. The interviews lasted between 60 and 90 minutes.

As a data collection method, interview was selected in the study. There were two linked reasons for the selection of this method. One of them was the purpose of the study. The aim of this study was to explore cultural factors that prevent groupware adoption and diffusion at a non-governmental organization. The term “culture” in this study was regarded as the combination of practical activities (culture-as-practice) with a structure of meanings (culture-as-system). In this way, practical activities that are subjected to contestation and change can be evaluated in relation to a loosely defined system of meanings that are attributed to groupware in the process of its adoption and diffusion. Second of them was the theoretical background of the study. The combination of the Actor-Network Theory and the Social Worlds Theory as a theoretical background necessitated a detailed understanding of people toward the use of groupware at TEGV. The questions like whether or not the responsibilities of people require collaboration at TEGV, whether or not collaboration can be realized through the use of Chatter at TEGV, whether or not people are willingful to use or promote the use of Chatter across their social worlds could be explored through open-ended questions. Therefore, the purpose and the theoretical background of the study were essential to prefer interview as a data collection method.

In summary, ten people were interviewed at TEGV. The working experience at TEGV played an important role in the degree of the participation of the respondents to the interviews. Lastly, interview was preferred as a data collection method. The purpose and the theoretical

background of the study could be regarded as the main reasons for preferring interview as a data collection method.

#### **4.4. Research Methodology**

In terms of research methodology, the theoretical background of the study and the coding processes are identified. Firstly, the three main features of the combined Social Worlds Theory and Actor-Network Theory are stated. Secondly, the three main coding processes in the data analysis are explained.

The combination of the Social Worlds Theory and the Actor-Network Theory guided the study through the exploration of cultural factors that prevent the adoption and diffusion of Chatter at TEGV. Therefore, the three main features of the theories were taken into consideration. One of them is both of the theories give importance to a relation between people and technology. Second of them is both of the theories give importance to alliance among people and people and people and technology. Third of them is both of the theories try to make sense of groupware adoption and diffusion not only structurally but also relationally through shared commitments, negotiation, persuasion, discussion, competition and so forth.

When it comes to the beginning of the coding process, initial coding was important to “remain open to all possible theoretical directions indicated by the readings of the data” and “to reflect deeply on the contents and nuances of the data by taking ownership of them (Saldaña 2009, p. 81). Therefore, all the patterns that were found in the data was marked. The formation of educational programs, the working habits, the present and desired level of collaboration, the organizational hierarchy, the communication channels, the current and future use of Chatter, the use of social media tools, the knowledge on Chatter, the incentives to use Chatter, and the problems with Chatter were revealed can be mentioned as the most repeated general codes throughout the initial coding.

When it comes to the second coding process, axial coding was important to “extend the analytic work from the initial coding” and “to strategically reassemble the data that were split or fractured during the initial coding process” (Saldaña 2009, p. 159). Therefore, the axial coding allowed for the reorganization and recreation of the existing codes. The most beneficial part of this coding process was to see the distinction and impact of various social worlds. The current system at the TEGV management and local units, the motivational reasons to adopt and diffuse Chatter at the TEGV management and local units, and the demotivational reasons to adopt and diffuse Chatter at the TEGV management and local units were revealed as the main categories. In this regard, even though many of the initial codes could be positioned at the intersection of these categories, the distinction of the management and the local units provided the ultimate dichotomy between the categories.

When it comes to the third coding process, the selective coding was important to “integrate and synthesize the categories derived from coding for the creation of a theory” (Saldaña 2009, p. 164). In this regard, the further examination of the data led to the questioning of valuing versus balancing: importance attributed to professionalism, connecting versus disconnecting: disconnection through communication channels, perceived interest versus perceived disinterest: use of groupware by influential people, and being traditionally alone versus being innovatively together: internalization of working habits. These four aspects were accepted as a way to distance people from the adoption and diffusion of a groupware technology.

To sum up, the theoretical background and the coding processes in the study were clarified. In terms of theoretical background, there were three main features of the combined perspectives of the Social World Theory and the Actor-Network Theory. One of them is both of the theories give importance to a relation between people and technology. Second of them is both of the theories give importance to alliance among people and people and people and

technology. Third of them is both of the theories try to make sense of groupware adoption and diffusion not only structurally but also relationally. In terms of coding processes, there were three main coding processes. The initial coding was beneficial for the understanding of the general data, the axial coding was beneficial for the establishment of the management and the local units as social worlds, and the selective coding was beneficial for the identification of ways to distance people from the adoption and diffusion of a groupware technology.

## **5. RESULTS**

In this section, the results that address the research questions are presented. How a groupware technology in a NGO cannot be adopted and diffused is identified and exemplified by examples. In this regard, four emergent obstacles are explored as a way to distance people from the adoption and diffusion of a groupware technology. It should be noted that the results have emerged from the data, so these four emergent obstacles could be accepted as the part of a Grounded Theory. These four obstacles contain certain values that are not only persuaded, negotiated and shared but also reflected into practices. In the first section, the role of professionalism within an organization is identified. Fixed job roles with a deep distinction between the local units and the management and a value given to specialty in the formation and execution of educational programs are evaluated. In the second section, the role of current communication channels within an organization is identified. The inadequacy of existing communication channels to provide collaboration is evaluated. In this sense, what and how Chatter can provide are also explored. In the third section, the role of the use of social media and Chatter by influential people within an organization is identified. How the attitude of supporting but not preferring the use of a technology can be an obstacle to the support for idea sharing within an organization is illustrated. In the final section, the role of accepted and traditionalized working habits within an organization is identified. Praising face-to-face communication, escaping from complaining and being accustomed to working slowly are evaluated.

### **5.1. Valuing versus Balancing: Importance attributed to professionalism**

In this section, the role of professionalism within an organization is identified. Fixed job roles with a deep distinction between the local units and the management and a value given to specialty in the formation and execution of educational programs and are evaluated.

The importance attributed to professionalism excluded people at TEGV from extending their given job roles. It was generally supposed that only a group of people are eligible to form educational programs that fit into the understanding of TEGV. This perspective was constantly underlined by the management and accepted by the local units. The practices and statements that strengthen the fixed job roles created a certain dichotomy between the management and the local units. One interviewee said that “Our volunteers at local units cannot execute any educational practices without taking our permission because this does not meet the needs of children.” He also added that “Every instructional step is determined before the start of education at TEGV.” As a result, people at TEGV wanted to neither cross the line nor do something wrong, which prevented any kind of participation and the use of any technologies that promote participation.

The importance attributed to professionalism was linked to a value given to specialty in the formation and execution of educational programs. It was pointed out that the basis of educational programs comes from their academic background, research and development, and content development. Therefore, it was accepted that only experts who are composed of academicians and educators have the right to speak for the formation of educational programs at TEGV. Neither the people from the management nor the people from the local units could contribute to this process. One interviewee said that “We cannot intervene in the formation of educational programs by expressing our demands and expecting its return.” This situation was thought as the feature that makes TEGV unique. Therefore, negotiations and persuasions between people supported the idea of “professionalism” and “its uniqueness”, not “collaboration” or “participation”.

In the light of the thing mentioned above, it can be said that the potential users of Chatter at TEGV did not want to disrupt social processes through groupware as mentioned in the topic

of “Challenges of Groupware”. However, the everyday use of Chatter could smoothen and fix these problems in the long term.

All in all, the management and the local units represented different social worlds in the case of TEGV. The collaborative and participatory environment that supports the adoption and diffusion of Chatter was lacking at the organization. Fixed job roles with a deep distinction between the local units and the management and a value given to specialty hindered the adoption of Chatter both in one social world and the diffusion of Chatter between various social worlds at the organization.

## **5.2. Connecting versus Disconnecting: Disconnection through communication channels or connection through Chatter**

In this section, the role of current communication channels within an organization is identified. The inadequacy of existing communication channels to provide collaboration is evaluated. In this sense, what and how Chatter can provide are also explored.

The use of Chatter at TEGV was linked to the change in the perception of TEGV from seeing the people at the local units as “employees and volunteers” to as “the second target group after children”. It was claimed that getting feedback from the local units turn into an important matter at the organization. Even though there were several attempts to use Chatter as the discussion platform - not only as the corporate communication tool, these efforts did not get a response in return. Thus, the current communication channels were still preferred as the primary communication channels at the organization. The communication process was respectively included taking of small notes on activity sheet and consolidation of them by the people at the local units, organization of term meetings within local units to discuss these notes, reporting of these meeting decisions to the management by the local units, organization of term meetings between the management and the leaders of local units to discuss the

decisions taken at the local units. The existing communication channels therefore created disconnection, rather than connection at the organization.

The existing communication channels made people at TEGV think about, understand, and express what they actually need as a communication and collaboration tool. The volunteers did not want to state their opinions, ideas or complaints only through their local unit representatives. The volunteers wanted to contact and work with the volunteers at the other local units. When the interviewees from the local units heard that Chatter can meet all of their demands, they came up with the ideas to increase the use of Chatter. Firstly, it was proposed that Chatter should be an active participant in the discussion of the attractive topics, such as scholarship or the European projects. In this way, Chatter could turn into an active discussion, negotiation and competition platform. Secondly, it was proposed that Chatter should be integrated to the physical educational environment. The use of posters and brochures could make Chatter get into the everyday conversations of people and spread the use of technology by word of mouth.

In the light of the things mentioned above, it can be stated that the potential users of Chatter did not have many possibilities to indicate their point of views on Chatter. Therefore, one of the most important groupware challenges was experienced at TEGV, which is the failure of intuition. Nevertheless, the creation of new opportunities for the potential users to explain their thoughts on Chatter could solve this challenge.

To sum up, the existing communication channels seemed to be disconnecting people rather than connecting them. The impracticability of the communication channels allowed people to identify and express their collaboration needs. This situation also allowed the interviewees to explain their motivational reasons for the use of Chatter.

### **5.3. Perceived Interest versus Perceived Disinterest: Use of groupware by influential people**

In this section, the role of the use of social media and Chatter by influential people within an organization is identified. How the attitude of supporting but not preferring the use of a technology can be an obstacle to the support for idea sharing within an organization is illustrated.

Making Chatter become an actor and an adopted collaborative technology within TEGV necessitated the active contribution of the influential people. The influential people could be identified as people from the management, the leaders of the local units, the experienced and senior volunteers and so forth in the case of TEGV. It was explored that there was a common attitude among these people. One interviewee among these people said that “I use Twitter as the only social media tool, but I always support the use of Chatter within TEGV.” Another interviewee said that “We will be better after an overall online transformation which will compromise Chatter, our website and social media accounts and all of these have nothing to do with my absence on social media.” The excuse for not using Chatter was presented as the dislike for social media in general. Nevertheless, this attitude would decrease the motivation of people at the organization to use Chatter.

The section of “Connecting versus Disconnecting: Disconnection through communication channels or connection through Chatter” revealed why people at TEGV would prefer to use Chatter. It was found out that people at TEGV would prefer using Chatter to state their opinions, ideas or complaints directly, not through their local unit representatives, to the management. The volunteers would also consider using Chatter to contact and work with the volunteers at the other local units. Therefore, the absence of the influential people on Chatter could discourage the other people at the organization to use Chatter.

In the light of the things mentioned above, the influential people at TEGV were likely to experience a difficulty in terms of work and benefit by using Chatter. These people could not see a direct benefit from the use of this application. This situation is actually identified under the eight main challenges of groupware. In this regard, turning Chatter into a social actor could solve this challenge.

All in all, the spread of technology within social worlds would require some actors to persuade the other actors to use this technology. In the case of TEGV, the attitude of supporting but not preferring the use of a technology could be an obstacle to the adoption and diffusion of Chatter.

#### **5.4. Being Traditionally versus Being Innovative: Internalization of working habits**

In this section, the role of accepted and traditionalized working habits within an organization is identified. Praising Facebook and Whatsapp, escaping from complaining, and being accustomed to working slowly are evaluated.

Firstly, Facebook and Whatsapp were accepted as the traditional collaboration tools at the local units. An interviewee from the local unit said that “Because we have our own local Facebook group, we are accustomed to continuing with it.” Another interviewee mentioned that “There is an already existing Whatsapp group to get access to each other, so why would I quit them?” Thus, people at the local units accept and routinize the use of Facebook and Whatsapp as the collaboration tools.

Secondly, people at TEGV evaluated the features of Chatter like discussion platforms as inconsistent with the working of a non-governmental organization. People at TEGV evaluated to express complaints and problems as something negative. Therefore, any technologies that support the expression of these matters were regarded as improper for any NGOs. One

interviewee stated that “I cannot indicate a problem straightforwardly until it is added to the agenda.” Another interviewee cited that “I do not like to express any problems at TEGV and I try to solve any problems alone or together with the other volunteers.” Another interviewee added that “Human relations are so good that there is no problem I have ever confronted with.” In short, the traditionalized escape from problems and complaints was identified as inconsistent with the features of Chatter.

Thirdly, being accustomed to working slowly emerged as the other working habit that prevented the adoption and diffusion of Chatter at TEGV. Being old school was liked and supported. Adopting not only a groupware technology but any kind of technology was seen as difficult and time-consuming. One interviewee stated that “When I go to a meeting at the local units, I mention the aim and feature of Chatter, but people at the local units do not even have an e-mail address.” Slow work was accepted and protected at the organization, so the features Chatter in terms of fastening decision-making process could be evaluated as a problem at the organization.

In the light of the things mentioned above, the two main challenges of groupware could be observed. The challenges of the insufficient number of people using groupware firstly and adoption process secondly could be identified.

In conclusion, accepted and traditionalized ways of working were thought as the important aspects of TEGV. Therefore, people questioned and compared the appropriateness of Chatter with these ways of working.

## 6. DISCUSSION

The aim of this study was to explore cultural factors that prevent groupware adoption and diffusion at a non-governmental organization. The combination of the Actor-Network Theory and the Social Worlds Theory as a theoretical background necessitated a detailed understanding of people at non-governmental organizations toward the use of groupware. To learn about the cultural factors that prevent the use of the technology at the organization, the below issues were talked with two people from the TEGV management, six people from İpek Kıraç Learning Unit, and one parent and her child attending TEGV.

- the current organizational structure at TEGV
- the formation and application of educational programs
- the expectations from a collaborative technology
- the perceived advantages of Chatter
- the perceived disadvantages of Chatter
- the elimination of these perceived disadvantages of Chatter

As a result, four obstacles were emerged as a way to distance people from the adoption and diffusion of a groupware technology. These four obstacles showed that different social worlds and different actors with their actions played an important role in the disuse of a groupware technology. These four obstacles were regarding the role of professionalism within an organization, the role of current communication channels within an organization, the role of the use of social media and Chatter by influential people within an organization and lastly the role of accepted and traditionalized working habits within an organization.

When it comes to the role of professionalism within an organization, there are two matters to be considered. Firstly it was found that people at TEGV wanted to neither cross the line nor do something wrong, which prevented any kind of participation and the use of any

technologies that promote participation. Secondly, it was found that negotiations and persuasions between people supported the idea of “professionalism” and “its uniqueness”, not “collaboration” or “participation”.

When it comes to the role of current communication channels within an organization, it was explored that the current communication channels that have been used for years posed an obstacle to the use of Chatter. The existing communication channels therefore created disconnection, rather than connection at the organization.

When it comes to the role of the use of social media and Chatter by influential people within an organization, it was identified that the excuse for not using Chatter was presented as the dislike for social media in general. The attitude of supporting but not preferring the use of a technology thus could be an obstacle to the adoption and diffusion of Chatter.

When it comes to role of accepted and traditionalized working habits within an organization, there were three matters to be considered. Firstly, it was discovered that people at the local units accept and routinize the use of Facebook and Whatsapp as the collaboration tools. Secondly, it was discovered that the traditionalized escape from problems and complaints was identified as inconsistent with the features of Chatter. Lastly, it was discovered that slow work was liked and supported, so adopting not only a groupware technology but any kind of technology was hence seen as difficult and time-consuming.

After the completion of the study, it was clearly identified that there were significant theoretical implications, managerial implications and research limitations to be mentioned. These issues are evaluated in the remaining sections.

### **6.1. Theoretical Implications**

There are two significant theoretical contributions of the study. One of them is the integration of culture-as-practice and culture-as-system perspectives. Second of them is the integration of the Actor-Network Theory and the Social Worlds Theory.

The major contribution of this study is to the literature on the adoption and diffusion of groupware technology. Although there have been various studies on the adoption and diffusion of groupware technology, there are few studies that look at the cultural factors in the adoption and diffusion of a groupware technology. In this study, exploring the role of culture in groupware adoption and diffusion was identified as significant to shed light on the reasons for not adopting groupware in a given group of people. In this respect, it was proposed that studying groupware adoption and diffusion through practical activities (culture-as-practice) could be seen as complementary to studying it through a structure of meanings (culture-as-system). By gaining this combined perspective, practical activities that were subjected to negotiation or discussion were evaluated in relation to a loosely defined system of meanings that were attributed to groupware in the process of its adoption and diffusion.

The second contribution of this study is to the unit of analysis in the adoption and diffusion of groupware. In the literature on groupware adoption and diffusion, it has been common to benefit from traditional approaches, such as Diffusion of Innovations Theory or Technology Acceptance Model, that prefer the predetermined unit of analysis, such as individual, work-unit, organizational or multiple levels. In this study, exploring the dynamic and changing relationship between people and technology was identified as significant to shed light on the reasons for not adopting groupware in a given group of people. In this respect, the non-traditional approaches of the Actor-Network Theory and the Social Worlds Theory were combined as a theoretical background. Therefore, the relation among people, the relation between people and a technology, and the role of both people and a technology as actors in the adoption and diffusion processes were taken into consideration without a predetermined

unit of analysis. In this way, this study also achieved to assess the process of groupware adoption and diffusion not only structurally but also relationally through shared commitments, negotiation, persuasion, discussion, competition and so forth.

In conclusion, there are important theoretical contributions of the study. The combined approach of culture-as-practice and culture-as-system perspectives in the first place and the combined approach of the Actor-Network Theory and the Social Worlds Theory in the second place enabled to explore the cultural factors in the disuse of a groupware in a more comprehensive way.

## **6.2. Managerial Implications**

There are two interrelated managerial implications of the study. One of them is that different social worlds can have their own cluster of ideas and practices towards an introduced groupware technology. Second of them is that a technology itself has a significant role in its adoption and diffusion.

Firstly, social worlds are unique, so they should not be generalized by managers. The solutions to the disuse of a groupware technology among different social worlds should also be unique. This situation requires the understanding of the differences among these social worlds in terms of idea and practice. For the people in one social world, the use of a groupware technology can be an opportunity for engagement. On the other hand, for the people in another social world, the use of a groupware technology can be an obstacle to the traditionalized ways of working. In this regard, the influential people can play an important role by motivating people and spreading the technology from one social world to another. To sum up, the unique properties of social worlds necessitate the unique solutions to the disuse of a groupware technology.

Secondly, a groupware technology itself is an actor, so making an alliance with this technology is crucial for managers. While a groupware technology is interpreted and acted upon differently by social worlds, the distinctive uses of this technology can be detected and utilized. In this regard, creating a stronger link between people and a technology is an important task for managers. For example, the respondents in the study proposed that Chatter should be an active participant in the discussion of the attractive topics, such as scholarship or the European projects. In this way, Chatter could turn into an active discussion, negotiation and competition platform for them. In conclusion, a groupware should be seen not only as “an collaborative technology” but also as “a collaborative actor”

In short, the management at an organization should consider two important matters in the adoption and diffusion of groupware. Firstly, social worlds do not have the same properties, so the introduction of a groupware technology needs the customized efforts towards different social worlds. Secondly, a groupware should not be seen only as the collaborative technology, it should also be identified as the collaborative actor as well.

### **6.3. Research Limitations**

The restrictions of the study can be stated as conducting the interviews with the limited number of respondents, focusing specifically on the cultural factors that prevent the adoption and diffusion of groupware, and considering Chatter as the particular groupware technology.

In the study, the respondents were limited in number. Conducting interviews with more respondents could mean the further exploration of social worlds. This situation could provide a more detailed explanation on the cultural factors that prevent groupware adoption and diffusion at the organization. Thus, new studies may replicate the study with more respondents at the organization. Needless to say, new studies that take place at different non-governmental organizations may also provide a more comprehensive perspective.

In the study, the cultural factors were focused as the preventing factors in groupware adoption and diffusion. However, there could be different factors that prevent the use of a collaborative technology. In this regard, exploring the role of technical aspects and user-friendliness of a groupware technology may be considered as another research topic.

Last but not least, in the study, Chatter was chosen as the specific groupware technology to be investigated. Exploring the possibility for the use of different groupware technologies could extend the scope of the study. Therefore, the new scenarios that develop along with the introduction of new groupware technologies at the organization may be studied in the future.

All in all, there were three main research limitations in the study. These were about conducting the interviews with the limited number of respondents, focusing specifically on the cultural factors that prevent the adoption and diffusion of groupware, and considering Chatter as the particular groupware technology.

## REFERENCES

- Bafoutsou, Georgia and Gregoris Mentzas (2002), "Review and functional classification of collaborative systems," *International Journal of Information Management*, 22 (4), 281–305.
- Bikson, Tora K. and John. D. Eveland (1996), "Groupware Implementation: Reinvention in the Sociotechnical Frame," in *Proceedings of the 1996 ACM conference on Computer supported cooperative work*, 428–37.
- Bostrom, Robert P. and J. Stephen Heinen (1977), "MIS Problems and Failures : A Socio-Technical Perspective PART II : The Application of Theory," *MIS Quarterly*, 1 (4), 11–28.
- Clarke, Adele E. (1991), "Social Worlds Arenas Theory as Organizational Theory," in *Social Organization and Social Process: Essays in Honor of Anselm Strauss*, D. R. Maines, ed., New York, USA: Aldine de Gruyter, 119–58.
- Davis, Fred D. (1989), "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *Management Information Systems Research Center*, 13 (3), 319–40.
- Eneh, Onyenekenwa Cyprian (2010), "Technology Transfer, Adoption and Integration: A Review," *Journal of Applied Sciences*, 10 (16), 1814–19.
- Fuks, Hugo, Alberto Raposo, Marco A. Gerosa, Mariano Pimental, and Carlos J.P. Lucena (2007), "The 3 C Collaboration Model," in *Encyclopedia of E-Collaboration*, N. Kock, ed., New York: Information Science Reference, 637–44.
- , ———, Marco Aurélio Gerosa, Mariano Pimentel, Denise Filippo, and Carlos Lucena (2008), "Inter- and intra-relationships between communication coordination and

- cooperation in the scope of the 3C collaboration model,” in *Proceedings of 12th International Conference on Computer Supported Cooperative Work in Design*, 148–53.
- Gallivan, Michael J. (2001), “Organizational Adoption and Assimilation of Complex Technological Innovations: Development and Application of a New Framework,” *The Data Base for Advances in Information Systems*, 32 (3), 51–85.
- Grudin, Jonathan (1994a), “Computer-Supported Cooperative Work: History and Focus,” *IEEE Computer*, 27 (5), 19–26.
- (1994b), “Groupware and Social Dynamics: Eight Challenges for Developers,” *Communications of the ACM*, 37 (1), 93–105.
- (1999), “Groupware: Their History and Trajectory,” in *Designing Communication and Collaboration Support Systems*, Y. Matsushita, ed., Amsterdam: Gordon and Breach Science Publishers, 1–14.
- Huang, Jimmy C., Sue Newell, Robert D. Galliers, and Shan-Ling Pan (2003), “Dangerous Liaisons? Component-Based Development and Organizational Subcultures,” *IEEE Transactions on Engineering Management*, 50 (1), 89–99.
- Lococo, Anthony and David C. Yen (1998), “Groupware: Computer Supported Collaboration,” *Telematics and Informatics*, 15 (1), 85–101.
- Mark, Gloria and Steven Poltrock (2003), “Shaping Technology Across Social Worlds: Groupware Adoption in a Distributed Organization,” in *GROUP '03 Proceedings of the 2003 International ACM SIGGROUP Conference on Supporting Group Work*, 284–93.
- and —— (2004), “Groupware Adoption in a Distributed Organization: Transporting and Transforming Technology through Social Worlds,” *Information and Organization*, 14 (4), 297–327.

- Von Meier, Alexandra (1999), "Occupational Cultures as a Challenge to Technological Innovation," *IEEE Transactions on Engineering Management*, 46 (1), 101–14.
- Olson, Gary M. and Judith S. Olson (2002), "Groupware and Computer-Supported Collaborative Work," in *The Human-Computer Interaction Handbook*, Hillsdale, NJ: L. Erlbaum Associates Inc., 583–95.
- Orlikowski, Wanda J. (1992), "Learning from Notes: Organizational Issues in Groupware Implementation," in *Proceedings of the 1992 ACM Conference on Computer-Supported Cooperative Work*, 362–69.
- Rhodes, Jo (2009), "Using Actor-Network Theory to Trace an ICT (Telecenter) Implementation Trajectory in an African Women's Micro-Enterprise Development Organization," *Information Technologies and International Development*, 5 (3), 1–20.
- Rogers, Everett M. (1983), *Diffusion of Innovations*, The Free Press, New York.
- Ruppel, Cynthia P. and Susan J. Harrington (2001), "Sharing Knowledge through Intranets: A Study of Organizational Culture and Intranet Implementation," *IEEE Transactions on Professional Communication*, 44 (1), 37–52.
- Saldaña, Johnny (2009), *No Title*, California: Los Angeles: Sage.
- Scalia, Lynne M. and Benjamin Sackmary (1996), "Cooperative Work in the College Classroom," *Business Communication Quarterly*, 59 (4), 98–110.
- Sewell Jr., William H. (2005), "The Concept (s) of Culture," in *Beyond the Cultural Turn: New Directions in the Study of Society and Culture*, G. M. Spiegel, ed., New York: Routledge, 76–95.
- Tatnall, Arthur and Anthony Gilding (1999), "Actor-Network Theory in Information Systems Research," in *10th Australasian Conference on Informations Systems*, 955–66.