

**THE IMPACT OF E-CONFERENCING APPLICATIONS ON
BUSINESS TRAVEL DECISION MAKING:
A QUALITATIVE ENQUIRY**

by

Kunwei Lin

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ABSTRACT

Business travel has been steadily decreasing for several years in the United States. Meanwhile, the adoption of e-conferencing technology has dramatically increased since 2007. Although the decline in travel has been largely attributed to economic factors, the role and impact of e-conferencing on business travel has never been investigated in either the trade press or academic literature. Based on a literature review, four major e-conferencing formats were identified—audio conferencing, web conferencing, video conferencing, and total virtual conferencing. This study explored the impact of e-conferencing on business travel decision-making. A qualitative, multiple-case study approach using a set of six interviewees from different sectors of industry was deployed. One managerial level person from each firm was interviewed using a semi-structured questionnaire. Interviews were transcribed and subsequently analyzed using Atlas.ti. Grounded theory and the narrative research method were applied in the data analysis process. In terms of the use of e-conferencing, three major themes were identified from the transcripts, namely Usage, Cost, and Interaction. Both positive and negative attributes under each theme were discussed. The findings illustrated that the positive attributes of e-conferencing, such as ease of use and cost efficiency, drive people to adopt it. The economic downturn as well as budget cuts have forced corporations to switch to virtual alternatives to business travel. In addition, when it comes to choosing a conferencing format, different types of meetings had different needs, based on the purpose of each

meeting. The category of industry and the individual's work function were also important determinants in selecting conferencing format. In the short term, especially in an economic downturn, e-conferencing can substitute for business travel. However, in the long term, e-conferencing will serve as a complement to business travel. The results of this study will benefit e-conferencing solution/service providers, e-conferencing users, and academics.

Keywords: e-conferencing, business travel, economy, conferencing format, meeting type

Chapter 1

INTRODUCTION

Business travel has been the mainstay of revenues for a significant component of the lodging industry. In the United States alone, more than 38 million business travelers generate \$210.5 million person-trips annually (Miller & Washington, 2009). Also, although it accounts for only 18% total of travel volume, business travel generates 31% (\$153 Billion) of all domestic travelers spending.

However, in terms of percentage, business travel has been on the decline in the United States. Telecommunications Industry Association (TIA) data reports a 4% drop (from 29% to 25%) in business travel volume compared to an increase in leisure travel volume (71% to 75%) (Miller & Washington, 2009). Although the decline has been largely attributed to economic factors, the role and impact of e-conferencing on business travel has never been investigated in both the trade press and academic literature. For instance, the videoconferencing market, a primary e-conferencing tool, has grown from \$460 million in 2006 to \$950 million in 2009 and is further expected to expand to \$1.5 billion in 2012 (TIA, 2009).

Therefore, what will be the impact of these e-conferencing applications on corporate travel?

Business Travel

The tourism industry is a very broad industry. It covers more than 15 interrelated segments, from lodging establishments, airlines and restaurants, to cruise lines, car rental, travel agents, and tour operators (Miller & Washington, 2009). Miller and Washington (2009) also stressed that tourism has now become the third largest retail sector in United States, following automotive and food retail. Travel and tourism is currently considered to be the largest service export industry (International Trade Administration, 2009).

Types of Travel.

With the development of transportation, travel has expanded greatly in the past few decades (Black, 1990). Travel expenditure in United States of domestic and international travelers was about \$777.2 billion in 2008 (Miller & Washington, 2009). Travel can be categorized by numerous methods. For example, by transportation carriers, there are air travel, road travel, train travel and cruise travel. If measured by geographical features, then it could generally be divided into domestic travel, and international travel. For purposes of this study, a relatively general category is adopted: leisure travel and business travel. According to Davidson (1994), cited by Swarbrooke and Horner (Swarbrooke & Horner, 2001, p11), whether a travel is distinguished as leisure travel or business travel, the following aspects are usually examined:

- Who pays?
- Who decides on the destination?
- When do trips take place?
- Lead-time (Period of time between booking and going on the trip)?
- Who travels?
- What kind of destinations is used?

Table 1 illustrates the aspects of leisure travel and business travel based on the above list. From the table, one can conclude that leisure travel is more involved with personal pursuits, while business travel deals more with all aspects of business functions. Besides, based on the information of the destination, frequency, lead-time and the number of travelers, there is a high possibility that business travel generates higher revenue to the hospitality and tourism industry.

Table 1 Leisure Travel and Business Travel

	Leisure Travel	Business Travel	But...
Who pays?	The tourist	Not the traveler but employer or association	Self-employed business travelers pay for their own trips
Who decides on the destination?	The tourist	The organizer of the meeting/incentive trip/conference/exhibition	Organizers will often take into account delegates' wishes
When do trips take place?	During classic holiday periods and on weekends	All year round, typically Monday to Friday	July and August are avoided for major events.
Lead-time (period of time between booking and going on the trip)?	Holidays usually booked a few months in advance: short breaks a few days	Some business trips must be made at very short notice	Major conferences are booked many years in advance
Who travels?	Anyone with the necessary spare time	Those whose work requires them to travel, or who are members of associations	Some people on business trips are accompanied by partners/family who are not on business
What kind of destinations is used?	All kinds—coastal, city, mountain and countryside sectors	Largely centered on towns and cities in industrialized countries	Some meetings and training courses take place in remote rural locations and incentive destinations are much the same as for upmarket holidays

Source: adapted from Swarbrooke & Horner (2001).

Rob Davidson (1994) once defined business travel in his book “Business Travel”, cited by Swarbrooke and Horner (2001, p3) as follows:

Business tourism is concerned with people travelling for purposes which are related to their work. As such it represents one of the oldest forms of tourism, man having travelled for this purpose of trade since very early times”. (Davidson, 1994)

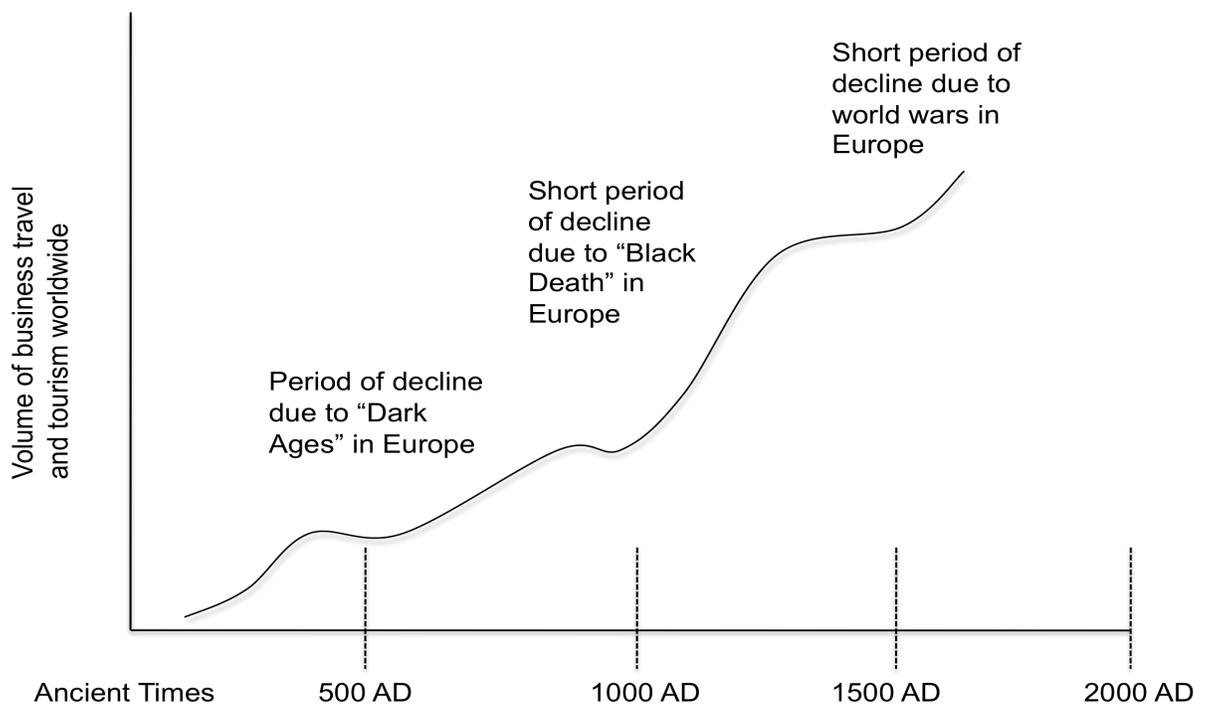
Swarbrooke and Horner (2001) argued that the terms “business travel” and “business tourism” should be distinguished carefully due to a qualitative difference between them. Business tourism encompasses all aspect of the experiences within business travel, in contrast, business travel focuses particularly on the movement of business travelers from location A to B.

In this study, the researcher attempts to explore the corporate attitude to business travel purchase and e-conferencing adoption. Therefore, business travel here is identified as a group consumer behavior, regardless of the difference between the two terms discussed above.

Development of Business Travel.

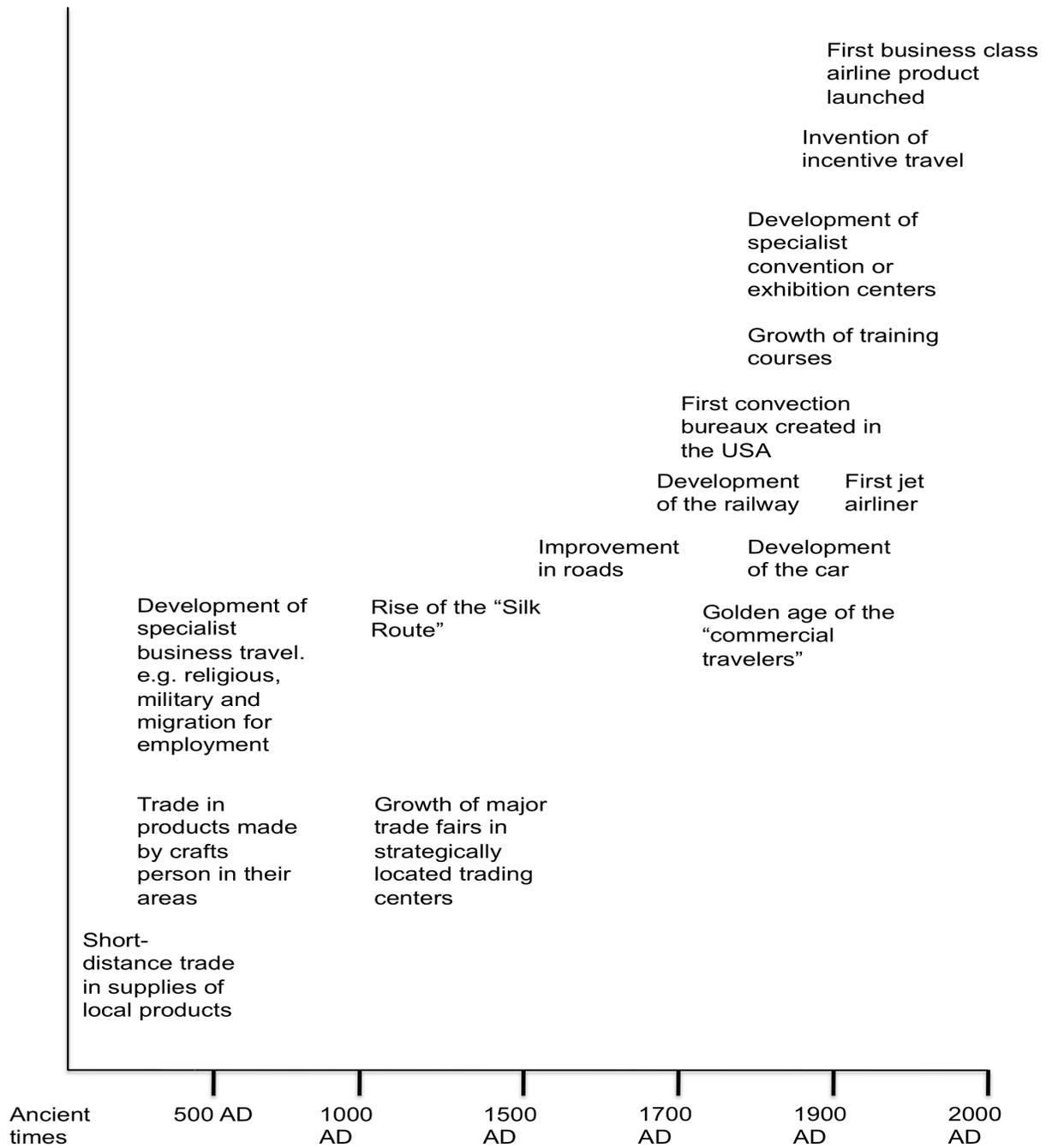
Business travel originated before 500AD (Swarbrook & Horner, 2001). Since it emerged during the time when agricultural trade appeared in Africa, Asia and Europe, business travel has greatly developed, especially in 2000s, due to popularity of the advanced transportations approaches (Black, 1990; Swarbrook & Horner, 2001). Figure 1 illustrates the growth of business travel through centuries. There were several major sources of power that boosted the development of business travel in history (Swarbrook & Horner, 2001). For example, every time with the rise of great empires such as Egypt, Persia, Greece, Rome and etc., the growth of this original business travel was further

stimulated. Others like the medieval trade fairs, the silk route, and industrial revolution all accelerated the growth. In modern times, the economic globalization, the increase in accessible markets and the advent of new technologies-enabled transportations are creating a boom in business travel (Haynes, Vecchi, Wickham, & Ireland, 2006). Figure 2 illustrates some major developments in the history of business travel. Besides, the development of business travel can also be categorized by the advent of travel carriers. In the United States, the transportation system has been through the following phrases: ships (16th to 19th centuries), railways (19th century), roads (automobile manufacturing, 20th century) and airways (the later part of the 20th century) (Rodrigue & Comtois, 2009).



Source: Business Travel and Tourism, Swarbrooke & Horner (2001).

Figure 1 The Historical Growth of Business Travel Worldwide



Source: Business Travel and Tourism, Swarbrooke & Horner (2001).

Figure 2 Major Developments in the History of Business Travel

Purpose of Business Travel.

Business travel originated with trade between communities (Swarbrooke and Horner, 2001). The history of business travel can be tracked back to early human civilizations. As early as when agriculture just developed beyond the subsistence level, business travel began with the purpose of trade. This purpose led the growth of business travel market for centuries.

From 1990s to today, modern transportation facilities and the development of global economies have boosted the growth of business travel (Black, 1990). The purpose of business travel has been diversifying. A review of previous studies indicated that the main purposes of current business travel include: meetings, conferences, conventions, exhibitions, training courses, product launches and incentive travel (Armstrong, 2007; Miller & Washington, 2009; Swarbrook & Horner, 2001). Each of these purposes has a number of subdivisions. Some business travel are involve several divisions. For example, a salesperson travels to meet his clients to sell his company's new product, which covers both the purposes of meetings and product launches. It is reasonable that meetings can be further divided into corporate internal meetings and external meetings. Internal meeting usually refers to meetings within the organization but with geographical differences. External meeting refers to employees meeting people from outside the organization, primarily referring to customer meetings. Customer meeting is related to product launches, and product launches have a relatively broader scope. Not only does it include the one-to-one customer meetings, but also it refers to companies attracting publicity for new products and services that are being launched, which usually includes a range of

audiences such as media, retailers and consumers. The Convention Industry Council (CIC) released its 2004 Economic Impact Study in October 2005, cited by Miller and Washington (Miller & Washington, 2009, p.217), which shows that the highest direct expenditure distributed by business travel purposes falls in conventions and exhibitions, followed by meetings and incentive travel. Armstrong (2006) reported that business travelers believed internal business and customer meetings to be the major reasons for travel.

Demand for Business Travel.

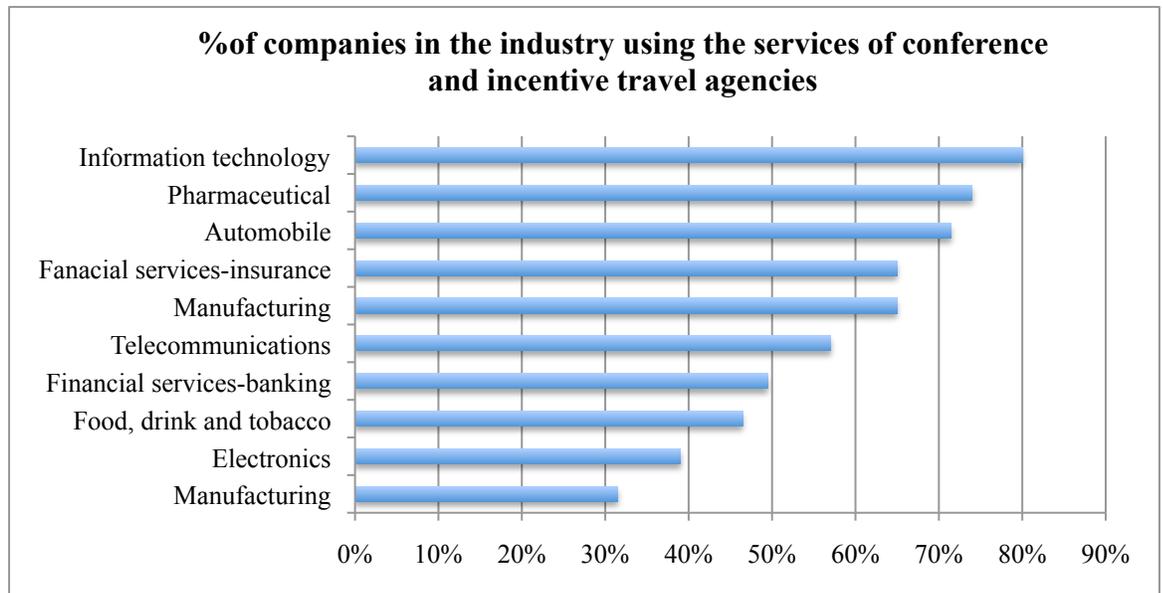
The demand for business travel varies by geography and time period. The factors that influence business travel demand include: level of economic development and state of the economy, currency exchange rates, degree of political stability, cost of living, historical and /or cultural links with particular places, the industrial structure and government policies on trade relations. Table 2 illustrates how the factors impact the demand of business travel.

Table 2 Factors Influencing Demand for Business Travel

Factors	Influence
Level of economic development and state of the economy	A high level of economic development and a strong economy increases demand and vice versa
Currency exchange rates	High relative exchange rates for the generating region against destination makes travel cheaper and stimulates imports while reducing exports to the destination, and vice versa
Degree of political stability	Political stability is required in both the generating region and the destination for business travel to flourish
Cost of living	A lower cost of living in the destination zone may well increase the attractiveness of the destination for conferences for people from the generating region
Historical and /or cultural links with particular places	The stronger these links the higher the expected level of business travel
The industrial structure	Business travel is likely to be greater between generating regions and destinations which have shared interests in particular industries, products and services
Government policies on trade relations	The more both governments support the policy of free trade, the greater the likely level of business travel between the two

Source: adapted from Swarbrooke and Horner (2001)

The level of demand for business travel also varies dramatically among different industries. Figure 3 illustrates the market for the services of conference and incentive travel agencies in the UK.



Source: Conference and Incentive travel (2000), cited by Swarbrooke & Horner (2001)

Figure 3 Level of Demand for the Services of Conference and Incentive Travel Agencies in the UK

Contribution of Business Travel.

Every year, business travel generates great revenue to the hospitality and tourism industry. For example in 2003, business travelers in U.S. generated \$153 billion, 31% of all domestic traveler spending; in 2004, taken as a whole, the meetings, conventions, exhibitions and incentive travel industry generated \$122.32 billion in total direct spending (Miller & Washington, 2009). Business travel benefits all dimensions of hospitality and tourism industry. Convention and exhibition spending for example, as shown in Table 3, benefited hotels, followed by air transportation and restaurant and catering corporations (Miller & Washington, 2009).

Table 3 Convention and Exhibition Spending Distribution (2005)

Area	Spending (US\$, Billion)
Hotels	24.11
Air transportation	16.08
Restaurant and catering	9.25
Business services	7.88
Local transportation	3.04
Retail	2.84
Meeting/ exhibit space	2.40
Technology	0.14
Other	2.18

Source: Convention Industry Council (CIC), adapted from Miller & Washington (2009)

The Change in Business Travel Market.

In a global view of business market, American Express Business Travel (2006) reported sales growth in excess of 20% in most key markets across Japan, Asia Pacific and Australia (JAPA). When it comes to the US market, according to TIA, from 2001 to 2006 the proportion of business travel compared to leisure travel in the total travel volume had been continuously dropping. Details are shown in Table 4.

Table 4 Travel Volume of Business Travel, 2001-2006

Year	Person-trips (Billion)	Business travel Volume (%)	Business travel Volume (Million)
2001	1.87	29%	542.3
2002	1.92	27%	518.4
2003	1.89	27%	510.3
2004	1.95	26%	507
2005	1.99	26%	517.4
2006	2.00	25%	500

Source: TIA, adapted from Miller & Washington (2009)

TIA reported 3.8% decline in business travel in 2008 and forecasted another decline of 2.7% in 2009 (Miller & Washington, 2009). National Business Travel Association reported 15% decline in revenue from business travel in 2009 (NBTA Report, 2009). Business Travel News (BTN)'s 2009 Corporate Travel Index showed that domestic business travel pricing growth slowed with modest increases from hotel, car rental and dining costs compared to 2008 and less is expected in future years due to decreasing demand (Boehmer, Baker, & Harris, 2009). Reports of decreased revenue from business travel were also released by hotel industry during 2008 to 2009 (Baker, 2009; Dagooc, 2009). Meanwhile, airlines have also shown concerns about the continuing decline in profits from business travel (Rosenblum, 2009).

Business travel is a big business that benefits the entire hospitality and tourism industry. It brings considerable contributions to global economic growth. The drop in business travel impacts negatively on the current business of hospitality industry and brings difficulties to the global economic recovery in the future as well (Belser, 2009; U.S. Travel Association, 2009). Therefore, it is crucial to monitor.

E-Conferencing

The Development of E-Conferencing.

E-conferencing that enable people to meet and have real-time interactions virtually that usually involves features such as audio and video, chat tools, and application sharing (“7 things you should know about Virtual Meetings,” 2006; Egidio, 1988). Therefore the development of virtual meeting mostly depends on the development of e-conferencing. In this study, the term e-conferencing covers all popular electronic

conferencing concepts: audio-conferencing (audio only), videoconferencing (include audio and video), web-conferencing (include audio and real time document sharing) and total virtual conferencing (include audio, video and real time document sharing). Figure 4 shows the types of e-conferencing formats and the technical support for each format.

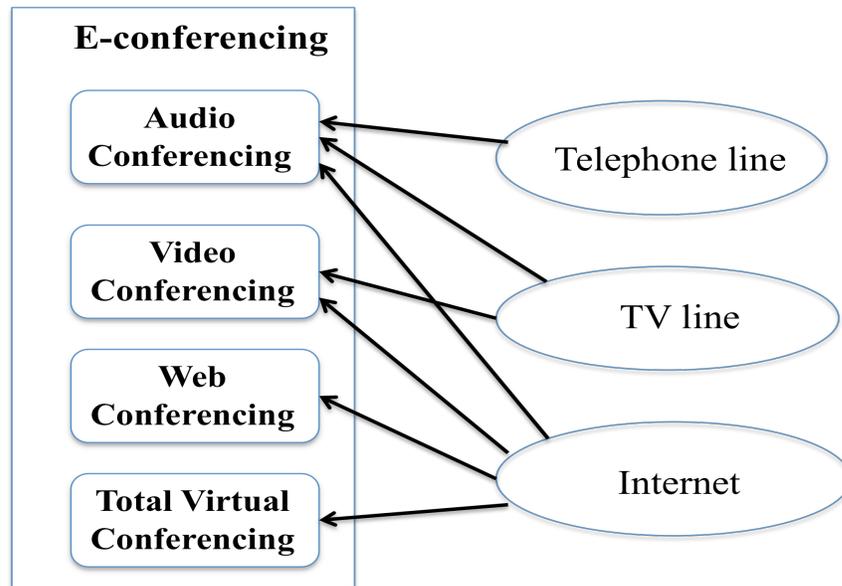
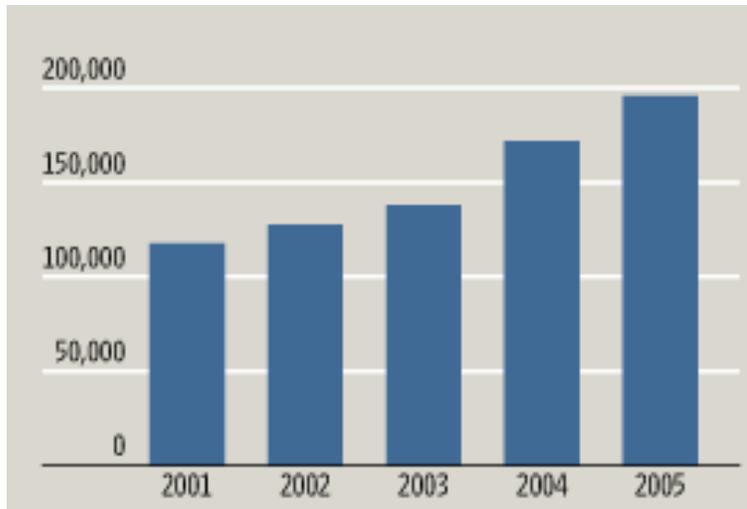


Figure 4 E-Conferencing Format and Technical Support

Based on the information provided by Wesley and Rash (1983), e-conferencing has been used for almost three decades. Numerous researchers identified the possibility of using technology for digital transmission of TV signals for videoconferencing purpose early in the 1970s (Camana, 1979; Elton, 1978; Kaneko & Ishiguro, 1980). In 1981, e-conferencing services were available in European countries; by 1985, the substitution of e-conferencing for business travel only amounted to 0.003% (Rao & Srinivasan, 1985). In the early 1980s, video conferencing technology indeed benefited various areas such as

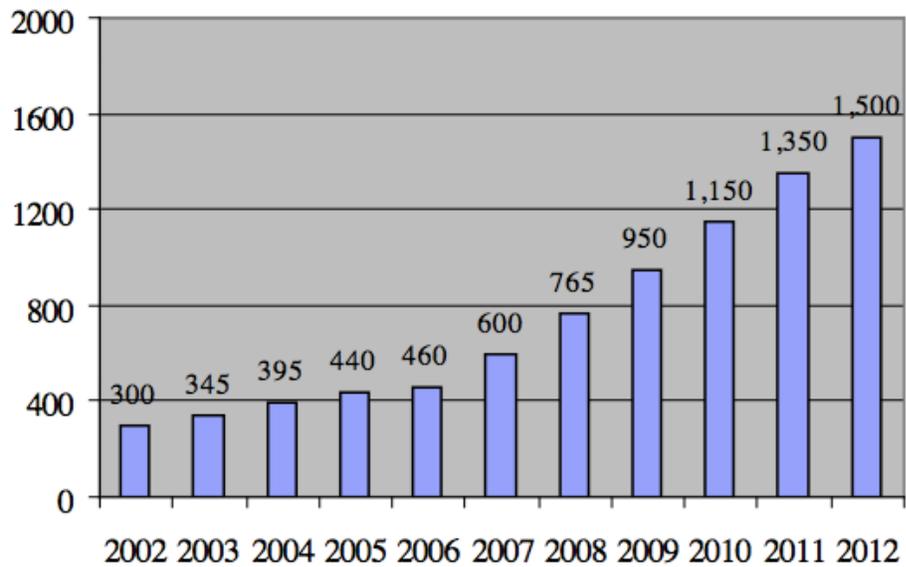
hospital, education and inter-organization communication (Wesley & Rash, 1983). However, it did not grow as fast as it was predicted in the 1970s that 85% of meetings would be substituted by virtual approaches by the 1980s (Egido, 1988). The failure of e-conferencing in becoming the broad solution that was predicted was attributed to early quality issues (Armstrong, 2007).

Take videoconferencing as an example, from 2001 to 2005, videoconferencing room installations worldwide has increased consistently as is shown in figure 5, to a spend of \$1.15 billion in 2005 (Bulkeley, 2006). Figure 6 illustrates the steady growth in spending on e-conferencing equipment during 2002 to 2009 in the United States (TIA, 2009). Moreover, it predicted that this growth will continue over the next three years as the development of more intelligent electronic devices, such as high definition camera, flat-screen HD televisions and surround-sound system, conferencing microphones and etc., as well as the greatly enhanced Internet bandwidth assures the stability and quality of e-conferencing continues to emerge (Woolley, 2009; Zielinski, 2009). Telepresence is the latest videoconferencing technology that allows more lifelike image transferring, participants' eye-to-eye contact and etc. (McNelley & Machtig, n.d.). The difference between Telepresence and traditional videoconferencing is reflected by more normal human interaction (Forbes, 2009). Until 2009, there are 225 companies—550 units, are using Telepresence worldwide and this market is estimated to grow four-fold between 2008 and 2010 (Knights, 2009; The Economist, 2009).



Source: Adapted from Bulkeley, 2006.

Figure 5 Worldwide Videoconference Room Installations



Source: TIA's TechTrends, Fall 2009

Figure 6 U.S. Videoconferencing Equipment Spending (\$Millions)

Another kind of e-conferencing that use Internet for digital transmission is called web-conferencing (“7 things you should know about Virtual Meetings,” 2006; Austin, Drakos, & Mann, 2006). Web-conferencing technologies, also called online conferencing, can be divided into service-based web-conferencing and server-based web-conferencing (Suduc, Bizoi, Filip, Academy, & Bucharest, 2009). Suduc et al. (2009, p. 9) describe service-based web-conferencing as “more applicable to occasional users” with a lower price that is usually carried by online conferencing service suppliers; while server-based web-conferencing refers to those “companies [that] can run by themselves on their internal network, dedicated servers, or network appliances”.

Main Players in the Market.

There are many companies providing Telepresence technology and services in the market as well as a considerable number of implementers (Forbes, 2009; FORUM Report, 2006; Gough, 2009; TANDBERG, 2006). The *New York Time* on August 6, 2003 reported that the sales of e-conferencing services were predicted to double by 2008 (“E-Commerce: Doubling Of Sales Is Seen By 2008,” 2003). It is estimated that the rate of growth of e-conferencing will be four times faster from 2008 to 2010 (Knights, 2009).

Suppliers.

The leading suppliers in the current market include: Cisco, which is the clear leader in the market, Polycom, Teliris, Telanetix, BT, Digital Video Enterprises (DVE), Gartner, TANDGERG, Nortel, FORUM, Avaya, HP,

Masergy etc. (Barounos, 2007; FORUM Report, 2006; Knights, 2009; Nortel, 2008; TANDBERG, 2009).

Implementers.

- Corporation implementers

Early implementers in the 1970s included AT&T, 3M, Boeing, Exxon, Xerox, American Hospital Association and etc. (Armstrong, 2007; Egido, 1988; Wesley & Rash, 1983). Anon (2006), cited by Armstrong (Armstrong, 2007, p 18), suggested that Boeing continues to use e-conferencing communicating with suppliers, which enabled it to build aircrafts globally. Coca-Cola is also one of the early e-conferencing adopters in the 1980s (Egido, 1988). According to Knights (2009), by the year 2009, around 225 companies were using Telepresence globally.

- Hotel implementers

Marriott and Starwood announced that they are going to install Telepresence in key properties around the world to turn the potential threats from Telepresence into a new competitive advantage (Gough, 2009). According to Gough (2009), hotel executives believe that doing this can combine the advantages of virtual meetings and business travel, which will feed the demand for virtual meetings at the same time keep the benefits of social interaction. This provides opportunities for business travelers to participate in long-distance conferences by travelling only relatively short distances. In addition, Zielinski

(2009) suggests that for companies with shrinking budgets, especially small businesses, rental e-conferencing is a good solution for virtual meetings.

Key Issues in Implementation.

- Technology features

Based on the review of available instructions for Cisco’s Telepresence product, key technology features of Telepresence are illustrated in Table 5 (Forbes, 2009).

Table 5 Key Technology Features of Telepresence Product

Audio/Visual	720-1080 line progressive scan high definition video cameras
	Advanced video codecs compress video signals so that high quality video can be transmitted at lowest possible bit rates
	Advanced audio Coding with low delay, echo cancellation, and interference filters for a life-like audio experience
Network	Uses IP networking deployed on enterprise networks
	Quality of Service (QoS) for high bandwidth applications
	Purpose-built furniture
Hardware Optimized Environment	Furniture design incorporates the technology elements such as cameras, microphones, speakers, and projectors, and lighting
Software	IP telephony
	Standards-based launching of sessions using a VOIP phone rather than customized controls
	Integrates with existing groupware solutions (e.g. Microsoft Outlook) for scheduling and corporate information access
	Scheduling, management, reporting, accounting/billing, performance metrics, and real-time support

Source: ARC Brief: Cisco TelePresence in Manufacturing: Changing Behavior for Enhanced Collaboration, Forbes, 2009.

- Cost

The cost of implementing e-conferencing varies when the technology features or devices change. A Wall Street Journal article (September 9, 2006)

stated that “the high-end systems with broadcast-quality cameras and a row of 50-inch plasma screens cost as much as \$1 million for a two-location system”, and another \$500, 000 for each additional point (Bulkeley, 2006). Besides, according to Bulkeley (2006), Polycom Corp., Pleasanton and Calif. also combined their technologies with the designs from an early developer of Telepresence system and sold it at \$250,000 to 500,000 a room. For budget implementers, some devices applicable for limited space and participants use (e.g. personal desktop) and free web-conferencing applications (e.g. Skype) are also available in the market (Knights, 2009; Woolley, 2009).

Comparison of Business Travel and E-Conferencing.

Both business travel and e-conferencing have their own advantages and disadvantages. Table 6 presents the comparison of the advantages and disadvantages between business travel and e-conferencing.

Table 6 Advantages and Disadvantages Between Business Travel and E-Conferencing

	Advantages	Disadvantages
Business Travel	<ul style="list-style-type: none"> •Direct personal contact •Building relationship •High effectiveness •Employee welfare 	<ul style="list-style-type: none"> •Financial cost •Time cost •Environmental harm •Low productivity
Virtual Meeting (e-conferencing)	<ul style="list-style-type: none"> •Travel cost reduction •Lifelike in-person experience •Employee work life balance •Improve productivity •Facilitate group decision making •Information restore •Environment friendly 	<ul style="list-style-type: none"> •Implementing and maintaining cost •Lack of deep personal interaction •Bandwidth issue, security issue and instability

Advantages and Disadvantages of Business Travel.

Previous researches and numerous industry surveys reveal that business travel not only benefits the corporation but also the employees who physically take the travel (Armstrong, 2007; “Business Travel "is Beneficial",” 2007; Gough, 2009; Miller & Washington, 2009; Swarbrook & Horner, 2001; TANDBERG, 2006).

The advantages of business travel are centered in the outcomes of the meeting and the benefits for employees. For example:

- Direct personal contact

A “handshake”, a gesture to the importance of the communication, is a need interwoven in commercial practice (Armstrong, 2007).

Mehrabian (1981) stressed in his book that approximately 93% of communication between people comes from non-verbal cues such as tone of voice and body language (Mehrabian, 1981). Research carried out by Roper for TANDBERG illustrated that compared to phone or email, face-to-face meetings turn out to be more personal and easier to understand therefore leading to the result of higher productivity and better memory of the meeting contents (TANDBERG, 2006). Some believe that a face-to-face meeting provides higher opportunity for compromise (Leek, Turnbull, & Naude, 2003).

- Building relationship

Business travel provides opportunities to build inter-corporation and interpersonal relationships. David Townshend, Marriott’s senior vice

president for corporate segments and international sales, insists that one critical element for the success of a business travel that is irreplaceable by technologies is the socializing activities after the meeting (Gough, 2009). Henry H. Harteveldt, a travel analyst for Forrester Research, in a New York Time News report emphasized that for humans, as social beings, “there are emotional as well as rational benefits to face-to-face meetings” and “Nothing replaces two business people building a professional relationship in person” (Mohn, 2009).

- High efficiency and productivity

The communication through business travel is so involved with rituals, intentions, meanings, engagements and performances that companies accept it to be worth the billions of dollars and millions of work days spent in it (Haynes et al., 2006). Barclaycard Business found in an annual travel survey that 79% of business travelers across the UK believed that their trips benefited their business (“Business Travel "is Beneficial",” 2007). New York Times News on November 23, 2009 reported that two recent reports, commissioned independently by the Business Travel Association and U.S. Travel Association, found a clear link between business travel and corporate profit (Mohn, 2009).

- Employee welfare

According to a TANDBERG report, on average more than half of the respondents from Europe considered business travel enjoyable,

including the features of new cultures, social activities and face-to-face interactions with clients (TANDBERG, 2006). The 2004 Business and Convention Travelers Report, cited by Miller and Washington (Miller & Washington, 2009), revealed that 60% of business travelers and 69% of frequent business travelers claimed to enjoy traveling on business.

Benefits of business travel to employees are also represented by building personal networks and deeper personal relations, the pleasure of getting out of the office and seeing new places, etc (Arnfolk & Kogg, 2003).

The disadvantages of business travel include financial cost, time cost, environmental harm and employee work-life balance issues. They are as follows:

- Financial cost

The cost of business travel for an organization is reflected by travel cost, cost of accommodations, and cost of travel allowances (Arnfolk & Kogg, 2003). Haynes et al. (Haynes et al., 2006) cited a 1999 American Express report that showed that business travel represented the third highest element of companies' expenditure after salaries and data-processing.

- Time cost

The time that employees are engaged in business travel can also be considered to be a cost for not doing efficient work for their companies (Arnfolk & Kogg, 2003).

- Environmental harm

Motor vehicles, trains and aircrafts release carbon dioxide, nitrous oxide, sulfate, soot and water vapor when they burn fuel (McMichael et al., 2004). In the United States, domestic travel via car, bus, trains and air is estimated to generate approximately 6% of all greenhouse gases (Barounos, 2007).

Advantages and Disadvantages of E-Conferencing.

Compared to business travel, take Telepresence as an example, there are following advantages:

- Travel cost reduction

Vodafone, a global mobile telecommunication company, which deployed TANDBERG videoconferencing in 50 locations, believes that, globally, 30% of travel costs in three years can be cut by the greater use of videoconferencing (TANDBERG, 2006). Earlier in this year, Gartner predicted that by the end of 2012, increased utilization of Telepresence solutions would help organizations to save \$3.5 billion annually in travel costs (TANDBERG, 2009).

- Lifelike in-person experience

Cisco, the major Telepresence supplier in the current market, explains that the Telepresence endpoint is a meticulously designed environment that create an “in-person experience” so that users in a telepresence session perceive similar experience to that in a personal encounter, even eye-to-eye contacts (Forbes, 2009; McNelley & Machtig,

n.d.). Nortel “*White Paper*” describes Telepresence as “a richer than real experience” (Nortel, 2008). It is capable of life-sized, high definition and dynamic video representations (Forbes, 2009).

- Employee work-life balance

TANDBERG claims that Telepresence technology can help employees to find the right work-life balance by giving employees the ability to collaborate with colleagues from a remote area (TANDBERG, 2006). Hopkinson and James (2006), cited by Armstrong (Armstrong, 2007, p. 19) found in a 2006 survey of BT Global Service (BT) that videoconferencing helps employees to free up time and provides a better work-life balance for employees.

- Productivity improvement

Telepresence allows business people to set up meetings promptly without the need of travel. The ability to meet people easily despite the geographical diversity enables more frequent and timely meetings (Armstrong, 2007; Forbes, 2009). Frequent communication therefore enhances the collaboration between widely dispersed business units and smooths the relationships between business entities: for example, vendor and client (Forbes, 2009; TANDBERG, 2006).

- Group decision-making facilitation

Internally, the use of instant Telepresence, as well as video conferencing, facilitates quicker decision-making and brainstorming

sessions (Armstrong, 2007; Forbes, 2009; Tierney, 2009). It has also been suggested that people appear to be less reluctant to present ideas where there is a veil of technology between them and more senior colleagues, which enlarges the sources of knowledge and fundamentally supports the group decision-making (Armstrong, 2007). In sum, e-conferencing provides a platform that supports dynamic group membership, dynamic organizational and geographical group member distribution, dynamic modes and different ways of communication, various group working practices, dynamic group member roles and various types of information exchange, all of which maximize the group decision-making efficiency (Terzis & Nixon, 1998).

- Information storage

Most of the meetings carried by e-conferencing can be recorded and presented to non-participants, or stored for future retrieval, later podcasts, webcasts and training, or to comply with transparency legislation (Nortel, 2008).

- Carbon footprint improvement

Environmental groups and institutions recognized that virtual solutions are effective alternatives to air travel, which help to improve a company's carbon footprint (Nortel, 2008). Major Telepresence suppliers highlight "saving environment by reducing business travel" when

promoting their products (Forbes, 2009; FORUM Report, 2006; TANDBERG, 2006)

Along with the benefits noted above there are some disadvantages as well.

- Implementation and maintenance cost

In the early stage of the development of e-conferencing, AT&T primarily used the technology it provided to the market for itself due to the high implementation and maintenance costs (Egido, 1988). According to Green and Hansell (1984), cited by Armstrong (Armstrong, 2007), that the installation cost was \$250,000 per location in the mid 1980s. A system called Halo, from Hewlett-Packard Co., was priced at \$425,000 for each outfitted room in 2006 (Bulkeley, 2006). According to Nemertes Research (2007), the cost of installing multiple high-end dedicated Telepresence facilities was \$250,000 to \$500,000 per room and \$35,000 per month for management services.

- Lack of deep personal interaction

Although technologies like Telepresence can bring people “in-person” experience during the meeting, they are not able to accomplish the social interaction between people after a physical face-to-face meeting that is helpful for building a deeper personal relationship (Gough, 2009).

- Bandwidth issues, security issues and instability

There are two main types of videoconferencing systems: group and personal systems, the former which require high-quality devices, better

technique support and relative greater bandwidth to offer the highest-quality video experience (Zielinski, 2009). Modern e-conferences are largely carried through Internet, making information security issues an inevitable problem (Suduc et al., 2009). In addition, the quality of the meeting largely depends on the facilities with which it has been equipped (Hartmann, 2009; McNelley & Machtig, n.d.).

Purpose of the Study

The primary purpose of this study is to examine the role of e-conferencing applications in business travel decision-making. The study also seeks to evaluate perceptual shifts in business travel volume specifically and how e-conferencing is playing a role in meeting travel decision-making among different cases that is studied in this research.

The study is guided by the following research questions:

- 1) How does e-conferencing fit the needs of business travel as a whole?
- 2) What is the perceived impact of e-conferencing on business travel decision-making?
- 3) Does the state of the economy have an impact on the choice of e-conferencing as alternatives to physical face-to-face interactions as perceived by the cases studied in this research?

Chapter 2

LITERATURE REVIEW

Business travelers have contributed significant value to the hospitality and tourism industry (Weaver & Oh, 1993). Business travel not only contributes to the transportation and lodging industries, but also simultaneously stimulates the foodservice, entertainment and general retail industries (Miller & Washington, 2009). Along with the development of business travel, many concerns have emerged from the society, including travelers' time value, work-life balance, communication efficiency, financial efficiency, global warming, social stability and etc. A serious economic crisis began in the United States at the end of 2007, and later expanded to other parts of the world. The crisis is predicted to last for a considerable length of time, and it has greatly reduced the global general demand (Miller & Washington, 2009). Meanwhile, development of e-conferencing has influenced business travel industry more and more each year. For example, Telepresence has become a new approach for "face-to-face" communication regardless of the geographical distance. A new American Express research found that 40% of C-level executives as well as top decision-makers are willing to turn to new virtual meeting technologies ("New Amex research," 2010). C-level executives refer to Chief Executive titles such as CEO, CFO, CIO, plus Owner and Partner. The findings also revealed that 89% of respondents indicated their companies currently or will plan to use e-conferencing for collaboration as an alternative to travel. The business travelers

have been such a “cash cow” for the hospitality and tourism industry that any change in their behaviors will critically influence the profitability of this industry. Business travel now is at a point in time when corporations have to cut all kinds of operating costs dramatically to survive the current economic crisis.

The Relationships Between Business Travel and E-Conferencing

The development of business travel and e-conferencing is worthwhile for exploration. Academics and industry practitioners hold various opinions in terms of the relationship between business travel and e-conferencing. Two popular opinions are as follows:

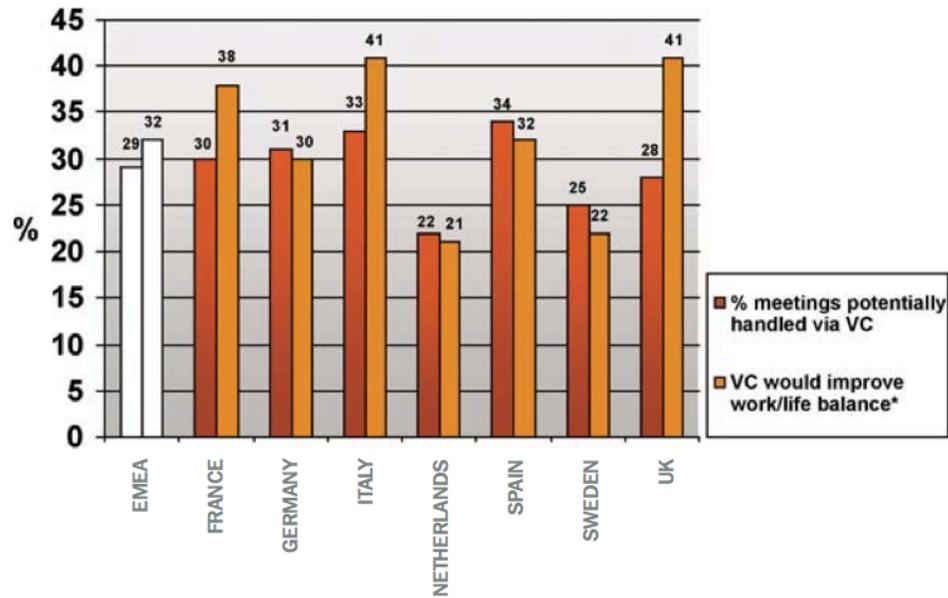
- E-conferencing substitutes for business travel
- E-conferencing completes business travel

In addition, meeting modes are also addressed as primary influencers when it comes to determining the better approaches for meetings.

Substitution.

In terms of the relationship between business travel and e-conferencing, one of the popular opinions is that business travel is substituted by e-conferencing (Armstrong, 2007; P.L. Mokhtarian & Meenakshisundaram, 1998; Patricia L. Mokhtarian, 2003). A number of empirical studies found net reductions in business travel due to the impact of e-conferencing (P.L. Mokhtarian & Meenakshisundaram, 1998). E-conferencing facilitates the growing attitude of a “no-fly” preference (Armstrong, 2007). People working from remote sites, which eliminates the need for the journey to work, reflects the truth of substitution. Substitution is considered to be the primary expected impact (Salomon, 1985).

From the point of practical view, Telepresence implementers claim that they will cut down business travel by using new technologies. According to the 2004 Business and Convention Travelers Report, (Miller & Washington, 2009), there were nearly 40% of business travelers substituting technology for travel in 2004. British & American Tobacco (BAT) eliminated over 5,500 flights in 2008 by using Telepresence (Knights, 2009). Vodafone believes they achieved a 30% reduction in travel within the company during 2006 to 2009 (TANDBERG, 2006). Figure 8 shows that on average 33% to 34% of respondents from eight European countries think that videoconferencing is a good alternative to business travel (TANDBERG, 2006). It is predicted that by year-end 2012, the rising utilization of e-conferencing solutions would save organizations up to \$3.5 billion annually in travel costs (TANDBERG, 2009).



Source: TANDBERG Discussion Document: Assessing the Real Impact of Business Travel, 2006.

Figure 7 Percentage of business travelers that think videoconferencing is a good alternative to business travel

Complementary.

Another opinion believes that e-conferencing will not replace business travel but complement it by providing more acceptable meeting approaches (Patricia L. Mokhtarian, 2003). Salomon (1985) rejected the substitution theory, claiming that e-conferencing technologies would not change human nature's desire for mobility. Arnfalk and Kogg (2003) stressed that applying correct meeting alternatives to appropriate modes of meeting would lead to more favorable outcomes. Zumkeller (1996) concludes that high levels of business travel are found to be associated with high levels of communication activity; therefore, "the complementary factor of the interrelationship between travel and communication is much stronger than the substitution one". The

research conducted by Mokhtarian and Meenakshisundaram found that email is the fastest-growing communication mode and travel is the second-fastest-growing mode, which demonstrates that the growing telecommunication technologies are complementing physical meetings (P.L. Mokhtarian & Meenakshisundaram, 1998). Besides, complementary effects are observed more in long-term studies with more comprehensive analyses (Patricia L. Mokhtarian, 2003).

The 2004 Business and Convention Travelers Report revealed that only 37% of business air travelers feel that the technologies discussed above contribute to higher effectiveness than face-to-face meeting when it comes to achieving business goals (Miller & Washington, 2009). Academic and hospitality practitioners feel confident that e-conferencing will not threaten business travel due to the nature of human beings and their desire for mobility (Gough, 2009; Salomon, 1985).

Meeting Types and E-Conferencing.

Previous studies suggest that business travel and e-conferencing can be applied to different meeting modes for favorable results (Armstrong, 2007; Arnfalk & Kogg, 2003; Barlow & Peter, 2002). For example, Kydd and Ferry (1994) addressed in their research that meetings using e-conferencing facilities are mostly for the purposes of information sharing or exchange and status checks (Kydd & Ferry, 1994). Roy and Filiatrault (2007) suggest that in terms of meeting alternatives, discussion should be brought to a deeper level by further dividing meetings into two groups— external meetings and internal meetings, according to the detailed attributes of the meeting (Roy & Filiatrault, 1998). Attributes are shown in Table 7. It is worthwhile to explore which type of meeting has a

higher potential to be substituted by virtual meeting approaches, as well as the degree to which e-conferencing impacts the adoption of meeting approaches for the external and internal meetings.

Table 7 External Meetings and Internal Meetings

External	Internal
Business development	Internal company business
Sales calls	Employee training
Meetings with customers/suppliers	Sales department meetings
Customer training	Technical problem solving
Customer service/service call	Visits to plants
Technical problem solving	Top management meetings
Trade shows	Project management
Industries meetings/Industry association meetings	Conferences/Seminars

Source: Adapted from Roy and Filiatrault, 1998.

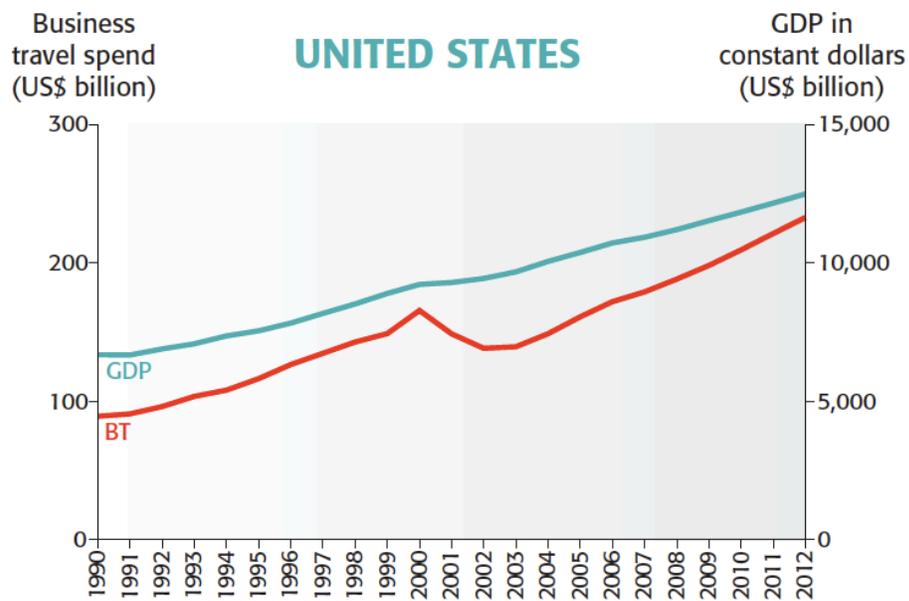
Economic Influences

The state of the economy influences both business travel purchase and e-conferencing implementation.

Economy and Business Travel.

The economy and business travel influence each other. Renard (2007) reported that business travel represents 40% of the entire global travel sector (US\$350 billion), which reflects the important role that business travel plays in helping to drive economic development. The health of the economy fundamentally impacts demand (Miller & Washington, 2009). Before the 2007- 2008 economic crisis, the economy was strong and growing globally and locally. The globalization of business and international expansion caused business travel to flourish. According to the National Bureau of Economic Research, cited by Miller and Washington (2009, p.22), the U.S. economy officially

entered a recession in December 2007 and the downturn continued throughout 2008, which challenged most sectors of the service industry, including travel and tourism. According to the Travel Industry Association, business travel declined by 3.8% in 2008 (Miller & Washington, 2009). As the economy declines, companies cut down their business travel: a survey with 131 Association of Corporate Travel Executives (ACTE) members revealed that 61% of respondents consider cost-reduction to be their primary goal when it comes to business travel, and one-third of them are expecting to spend less on travel (Ruiz, 2008). In 2009, companies worldwide largely cut their business travel budgets: for example, 66% in Europe and 15% to 20% in the United States (Air & Business Travel News, 2009; NBTA Report, 2009; Rosenblum, 2009). Figure 8 illustrates the growth of business travel against the US annual GDP (Renard, 2007).



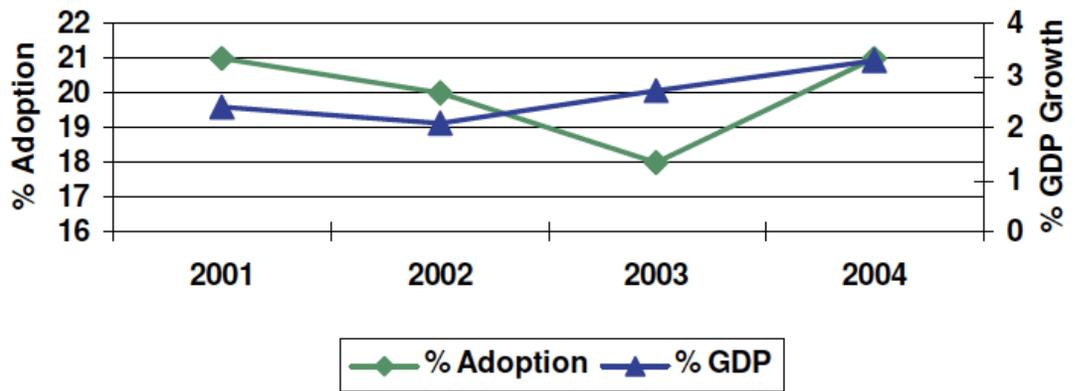
Source: Business Travel Drives Economic Growth, Renard, 2007

Figure 8 Economic Growth Compared to Growth in Business Travel

Economy and E-Conferencing Implementation.

There is sufficient evidence to demonstrate that the use of e-conferencing noticeably increased in the past two years during the global economic crisis. In addition, e-conferencing utilization has grown across the board regardless of the customer types: either “the high-end enterprises adopting Telepresence and HD solutions, or the desktop individual users” (Lemelin, 2009, p. 1). According to Knights (2009), a 2008 report estimated that the number of Telepresence units in operation will reach 1,300, and the market growth will approach 5,000, by the end of 2009. The report further predicted a significant growth in the e-conferencing market from US\$923 million in 2007 to US\$1.88 billion in 2012 (Suppiah, 2008). Driven by the Beijing Olympics and the global economic crisis, China's e-conferencing market experienced a 27% growth in revenue over the previous year of 2008 (In-Stat, 2009). There are multiple vendors of hardware, network, and software components involved in the process of implementing e-conferencing (Lemelin, 2009). For corporations with low budgets there are also combinations of different levels of facilities for e-conferencing, which creates the low-end market for e-conferencing suppliers (Woolley, 2009).

Another example of the relationship between economy and e-conferencing is shown in Figure 9, which depicts the UK videoconferencing adoption and GDP changes. Early data did not provide a strong evidence of the trend that currently appears in the market. However, it presents the changes in the same direction when the economy slowed during 2001 to 2002.



Source: Video Adoption: (O'Brien, 2005, p.59) & IMF, cited by Armstrong (2007, p.34)

Figure 9 Videoconferencing Adoption and GDP Changes in the UK

In sum, the relationship between business purchase and e-conferencing implementation seems to be complicated when the economy is taken into account. Is the drop of business travel truly attributed to the advantages of e-conferencing? If so, when the economy recovers, will companies continue cutting travel budgets by adopting e-conferencing? The results of this study will answer these questions.

Summary

As discussed above, the economy inherently drives the demand of business travel. In the meanwhile, e-conferencing has been proved to be an acceptable alternative that brings people into a virtual age. However, there is no conclusive evidence to suggest either that the growth of e-conferencing weakened the business travel market or that the economic downturn has resulted in a proven shift to technology. Although Kydd and Ferry in 1994 conducted a research that illustrates the managerial use of videoconferencing and how it fits into different meeting purpose, by adopting multiple

case study method, it was a single case study and it primarily focused on the use of videoconferencing. In this study, a multiple case study method is adopted and the research is expanded to all types of e-conferencing formats, including audio conferencing, video conferencing, web conferencing and total virtual conferencing. This research will be able to provide a more comprehensive result that illustrates the relationships between the economy, business travel and e-conferencing.

Chapter 3

METHOD AND DATA

Method

The three research questions posed by this study were as follows:

- 1) How does e-conferencing fit the needs of business travel as a whole?
- 2) What is the perceived impact of e-conferencing on business travel decision-making?
- 3) Does the state of the economy have an impact on the choice of e-conferencing as an alternative to face-to-face interactions as perceived by the cases studied in this research?

A qualitative multiple-case study was used to achieve the objectives of this research. An important strength of the case study approach is the ability to answer “how” and “why” questions within real-world contexts (Trickett, 1984, 1994). Yin (1994) described the case study method as “not either a data collection tactic or...a design feature alone but a comprehensive research strategy” (Yin, 1994, p13). In addition, in terms of capturing real-world contexts, multiple-case study has all of the advantages of a single-case design; with the additional advantage of enhancing the validity and generalizability of the findings (Galloway & Susan, 1994). This approach has been deployed in many studies and demonstrated to be reliable and effective. Case study methodology is also effective for generating theories or models from decision-making research (Eisenhardt, 1989).

Sampling

The multiple-case study in this research was structured as follows: The researcher purposefully interviewed six individuals from different sectors of industry. Each case served as a unit of analysis. There is no ideal number of cases that should be included in a multiple-case study; however, a number between 4 and 10 is generally acceptable (Eisenhardt, 1989). The cases of the current study were not selected randomly, but chosen to cross the breadth of industries as a whole. The cases comprise pharmaceuticals, finance, insurance, manufacturing/food industry/retail, and information technology. The functions of the interviewees in their corporations also varied. Among the cases, there were five international corporations with offices located globally, while one food manufacturing company has offices only within the US. However, all of the interviewees claimed that their organizations conducted international business. Five of the companies have more than 10,000 employees worldwide. A full description of each case is found in Table 8. All of the companies are using e-conferencing in their operations, which makes them all eligible as samples for this research.

Table 8 Summary of the Cases

Industry category	Insurance	Finance	Networking & telecommunication	IT practice	Manufacturing/food industry/retail	Pharmaceuticals
Work function	IT manager	Risk management director	Sr. technical manager	IT manager	Corporate sales manager	North America audit manager
Organization Size (# of employees)	> 10,000	>300,000	102,000	111,000	1,600	>60,000
Office Locations	<ul style="list-style-type: none"> •North America •Europe 	<ul style="list-style-type: none"> •North America •South America •Europe •Middle East •Asia Pacific 	<ul style="list-style-type: none"> •North America •South America •Europe •Middle East •Asia Pacific 	<ul style="list-style-type: none"> •North America •South America •Europe •Middle East •Asia Pacific 	•National	<ul style="list-style-type: none"> •North America •South America •Europe •Middle East •Asia Pacific
Use e-conferencing?	Yes	Yes	Yes	Yes	Yes	Yes

Data Collection

In this study, data was collected through interviews. Of the six interviews, three were conducted face-to-face and the rest were through phone calls. One call was made using a web conferencing application for real-time document sharing. One key employee from each of these firms was interviewed using a semi-structured questionnaire. The questionnaire comprised signposts derived from the literature that sought to determine how the use of e-conferencing impacts travel decisions in each individual firm.

Interviewees were allowed to tell their own stories freely about their experiences using e-conferencing and to go beyond the questionnaire. The data collection lasted for two and a half months. From March 12, 2010, to May 24, 2010, six interviews were completed. Each interview took 45 minutes on average. Interviews were recorded with the interviewees' agreement and transcribed for further analysis. The textual data subsequently was analyzed using Atlas.ti, a computer software program created from the grounded theory techniques of Strauss and Corbin (Xiang & Formica, 2007). Atlas.ti fulfills all the roles categorized by Computer-Aided Qualitative Data Analysis (CAQDA), namely text retrievers, text base managers, code and retrieve programs, code-based theory builders, and conceptual network building (Fielding & Lee, 1991; Ritchie & Lewis, 2003).

Data Analysis

Grounded theory and the narrative research method were used in the data analysis process.

Grounded Theory.

According to Cresswell (1998; as cited by Baqir, 2009), the idea of grounded theory research is to generate or discover a theory for a phenomenon that relates to a particular situation (Baqir & Palvia, 2009; Cresswell, 1998). The fundamental process of grounded theory is for researchers to discover key themes (also called codes, concepts, or properties) and describe their relationships using the textual data (Baqir & Palvia, 2009). Subsequently, categorizing the themes that have been discovered can develop the constructs of a theory.

In this study, two major coding techniques were used for qualitative data analysis, open coding and axial coding. With open coding, researchers can freely create the names of the codes that are used to identify, categorize, or describe the phenomena found in the transcripts. In this way, researchers are able to explore the “reference and reasons behind what and why something is being said” (Baqir & Palvia, 2009). After open coding, the textual data is categorized into several properties for further analysis. Axial coding allows researchers to name the relationships between codes based on inductive and deductive thinking and analysis.

In this research, three themes related to the use of e-conferencing were identified, namely Usage, Cost, and Interaction. In the theme of usage, transcripts were analyzed and coded in the contexts of Ease of Use and Results. Similarly, the codes of “Cost efficiency” and “Economic Downturn/Budget Cuts” were created for the theme of Cost, and the codes of “Social Interaction” and “Professional Interaction” were created for Interaction. These codes were further given either a positive or negative code in response

to the three themes that were to be analyzed. A positive code stands for a direct positive relationship between the code and the theme. A negative code stands for a direct negative relationship with the theme.

The following two examples illustrate the positive/negative coding:

1. “It helps me save a lot of time”

The context in which this statement was made is taken to be a positive response in relation to the theme of Usage, and was coded “Result +”.

2. “The connection is always a problem....”

The context in which this statement was made is taken as a negative response in relation to the theme of Usage, and was coded “Ease of Use –”.

Narrative Research.

The idea of narrative research is also important to the data analysis. Peoples’ stories vary, but “when a lot of people have the same conclusions drawn from their personal stories, patterns start to emerge” (Baqir & Palvia, 2009). For this study, it was important to analyze the narratives of people from diverse industries and work functions to find out how and why they differ or are similar.

Chapter 4

FINDINGS AND DISCUSSIONS

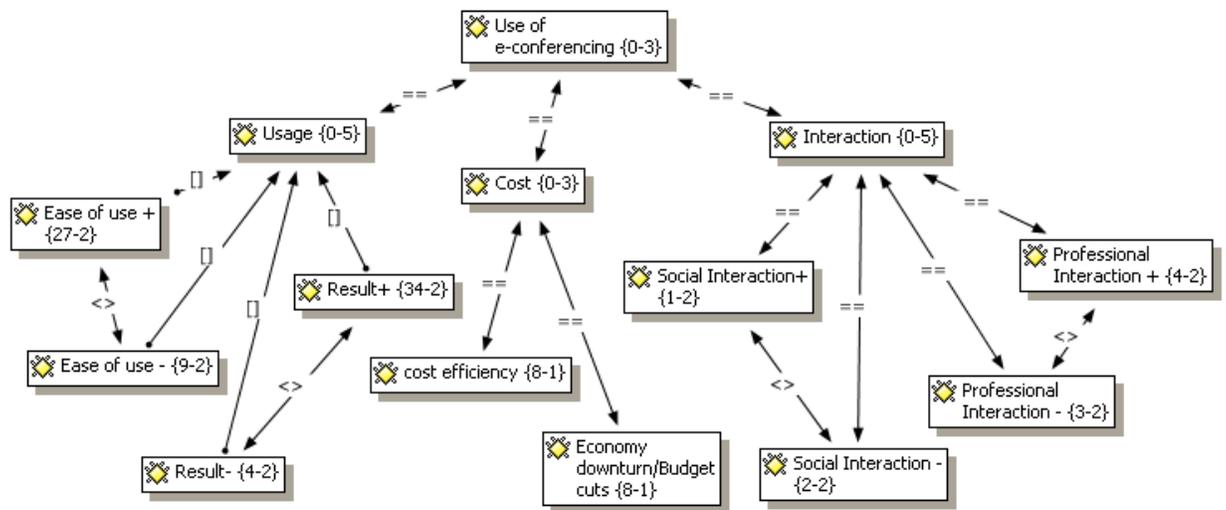
The findings of this case study will be presented in two segments, on the use of e-conferencing and on conferencing formats by meeting types. In the segment on the use of e-conferencing, the reasons why corporations/people adopt e-conferencing as a meeting approach will be explained and the major concerns people have and problems they have encountered using e-conferencing will be described. The influence of the economy, specifically an economic downturn, on business travel decision making and adoption of e-conferencing also will be addressed. It is important to point out that in this part of the research description, e-conferencing is discussed as a whole. Subsequently, a matrix illustrating the best match between meeting types and conferencing format will be presented, breaking out e-conferencing into audio, video, and web conferencing.

Attributes of E-Conferencing

E-conferencing is becoming more and more popular. From the free, simple personal desktop applications to the fancy advanced conference rooms that cost millions of dollars, almost everybody has some kind of access to e-conferencing. At the personal level, people use it to keep in touch with friends and family, interact with people all over the world, or work as a team across geographical distance. At the organizational level, depending on their functions and their industry category, people use it to conduct business, coordinate internal operations, and provide employee training, among other

things. As discussed in Chapter 1, according to press reports, the implementation of e-conferencing is continually increasing. Some people believe that the advantages of e-conferencing attract people to it. On the other hand, some people feel that corporations are compelled to use e-conferencing as an alternative to face-to-face meeting so as to cut costs by reducing business travel, especially during an economic downturn.

As explained above, data was categorized with codes. A structural view that shows the various codes and their relationships is presented in Figure 10.



Key to the relation symbols: == “is associated with”; [] “is part of”; <> “contradicts”

Figure 10 Main Coding Frame of the Use of E-Conferencing

The frame also displays the number of times that the relevant data was coded in a particular way. For example, a response such as the following: “It is very easy to set up the meeting,” was coded as a positive response in terms of ease of use under the theme of Usage, and is represented as “Ease of use +”. The number of occurrences appears next to

the code with notation like this {number of times directly coded - number of other codes it connects to}. The codes and meanings are illustrated in Table 9.

Table 9 Codes and Meanings for the Main Coding Frame (Figure 10)

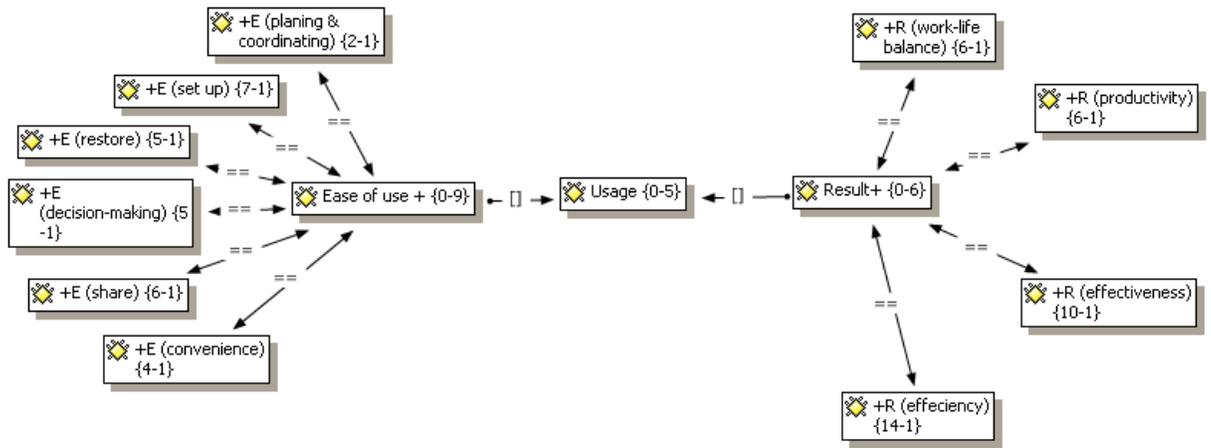
Codes	Meanings
Ease of use +	A positive response relevant to easy to use e-conferencing
Ease of use –	A negative response relevant to problems and concerns during using e-conferencing
Result +	A favorable result people get from using e-conferencing
Result –	A result of using e-conferencing with which people are not satisfied
Cost efficiency	E-conferencing helps to lower expenses
Economic downturn/budget cuts	Use of e-conferencing due to the economic downturn or because the organization has cut the travel budget
Professional interaction +	E-conferencing helps people improve their professional interactions
Professional interaction –	E-conferencing negatively influences people in terms of professional interaction
Social interaction +	E-conferencing helps people improve their social interactions
Social interaction –	E-conferencing negatively influences people in terms of social interactions

Positive Attributes of E-Conferencing.

Figure 10 presents the three themes of the use of e-conferencing and the further break-down under each theme as well as the positive and negative relationships between different codes. In other words, the three themes represent three major reasons why people adopt e-conferencing.

Usage.

All the positive responses relevant to how easy it is to use e-conferencing and the results are coded in the theme of Usage. Therefore, a second framework was built based on the codes that signify a positive relationship to usage in the main code frame, as shown in Figure 11.



Key to the relation symbols: == “is associated with”; [] “is part of”

Figure 11 Positive Attributes of using e-conferencing—Usage

Figure 11 presents how the codes “Ease of use +” and “Result +” are supported basing on the analysis of the transcripts. The code “+E” stands for the positive items of “Ease of use,” while “+R” stands for the positive items of “Result.” The terms in parentheses are brief descriptions of each item. The number of occurrences appears next to the code with notation like this {number of times directly coded - number of other codes it connects to}. Table 10 lists all the codes used in Figure 11 and their meanings.

Table 10 Codes and Meanings for Usage Coding Frame

Codes	Meanings
+E (planning and coordinating)	It is easy to plan and coordinate an e-conferencing meeting
+E (set up)	It is easy to set up a meeting
+E (sharing)	It is easy to share rich information such as files, multimedia, etc.
+E (convenience)	E-conferencing brings convenience/flexibility to people's work
+E (decision-making)	E-conferencing shortens the decision-making process
+E (restore)	It is easy to restore data, record the meeting, etc.
+R (work-life balance)	E-conferencing helps to improve work-life balance
+R (productivity)	E-conferencing helps to improve long-term productivity
+R (effectiveness)	E-conferencing helps to improve the effectiveness of work
+R (efficiency)	E-conferencing helps to improve the efficiency of work

As shown in Figure 11 and Table 10, the most widely cited reason that people like e-conferencing is for the ease of setting up a meeting. In the six interviews it was mentioned seven times, followed closely by the ease of sharing rich information (six times). The ease of sharing rich information was most relevant to the web-based conferencing context. People believe that the capability to share rich information in real time or immediately before the meeting brings lots of convenience to them and significantly improves their work efficiency.

The fact that an e-conference is easy to record and can be saved for later retrieval is also a highly rated feature that attracts people. For example, according to interviewees, it works very well for employee training. In many organizations, they record a training session then reuse it several times in a certain period of time to save manpower and maintain consistency. It works especially well for the training of a job that involves following standard procedures. In addition, because e-conferencing allows people to

surmount the geographical restrictions of work, they can have more flexibility in terms of location, which brings a lot of convenience to people's work as well. Here is an example quoted from the transcripts:

So ...we were all of [us] students round the [world]...a guy who was my classmate, the guy was in China, and I was in Minneapolis, and we have three people in Wilmington and we have [a] master's project to do and we could get it done with this tool, whereas five years ago it would have been calling each other on long international phone calls and try to figure out how to do it. So this is where that came big time [important to my] life.

As illustrated in Figure 11 and Table 10, another major reason that people adopt e-conferencing is because it produces favorable results, such as improving productivity, effectiveness, efficiency, and work-life balance. Among these, e-conferencing is most commended for helping people improve their work efficiency. With e-conferencing, people are able to finish work in just hours that might take several days with a traditional approach. It is believed to be a great time saver. In certain types of work, such as technical problem solving and project coordination, e-conferencing has been very effective at shortening the length of projects. Following are some examples from the transcripts:

I spend three to four days a week on the road, flying everywhere, you know doing all that stuff, so for me if I was able to cut all the travel out, and just have a video-conference, that would be a huge time saving.

That's exactly the power of technologies. And all these video, audio tools are getting to a place where they are actually helping do business much more efficiently.

...Customers and suppliers, the meeting is normally done [with a] web conferencing tool because it saves a lot of money and it's a very

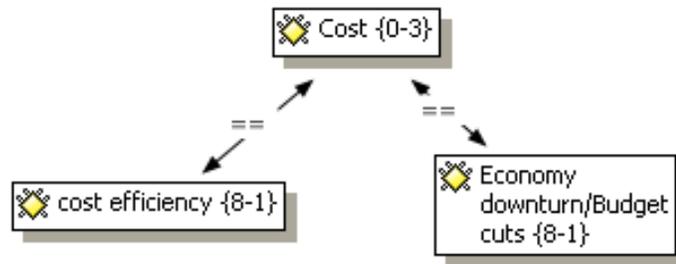
effective process because you can get much larger you know in terms of the number of people that you can meet and be more effective.

In terms of improving work-life balance, e-conferencing benefits tend to be more complicated. Basically, by reducing the time people have to spend on travel, they are satisfied that they actually get more time to complete other work or be with family. The flexibility of locations where they can work also benefits the work-life balance, because they can better handle emergencies coming from either their family or work. However, after being engaged with e-conferencing, people tend to work twenty-four hours seven days a week. The boundary between their personal life and professional life becomes blurred. From this standpoint, e-conferencing influences people's work-life balance negatively.

In summary, although reasons were divided into "ease of use" and "results," to some extent they are correlated. All the features of ease of use actually help to generate favorable results. For example, the ease of planning, coordinating, and setting up a meeting helps people to save time. Time saving along with the functionality of sharing rich information and the possibility of recording the meeting help to improve work efficiency. And the flexibility that e-conferencing offers people benefits not only the work-life balance but also work efficiency and productivity. These are all benefits that e-conferencing brings people in their work life.

Cost.

In terms of cost, most of the opinions were divided in two categories, cost efficiency and the economic downturn/budget cuts, as shown in Figure 12 and Table 11.



Key to the relation symbols: == “is associated with”

Figure 12 Reasons People Adopt e-conferencing—Cost

Table 11 Codes and Meanings for Cost Coding Frame

Codes	Meanings
Cost efficiency	It helps to save money
Economic downturn/Budget cuts	People have cut travel budgets and other costs because of the economic downturn

Cost efficiency.

Despite the installation fees, one very important benefit people get from using e-conferencing is that it saves costs by cutting business travel expenses. All interviewees strongly agreed that by using e-conferencing, they reduced overall travel costs. An example given by an interviewee that represents the cost efficiency is that by setting up e-conferences with suppliers instead of having them spend thousands of dollars to travel around, the organization leveraged that savings for a discount.

Economic Downturn/Budget Cuts.

Another cause of e-conference adoption is the economic downturn/budget cuts. Under the economic downturn, lots of corporations have had to cut their overall expenses to get through difficult fiscal years or even to survive. The travel budget is always the

first place to start. Despite the economic factor, corporations also cut budgets due to all kinds of internal issues, which also immediately shrinks the travel budget. Therefore, besides cutting off some activities, people have to seek alternatives to save costs and at the same time accomplish their work, as an interviewee described:

And for training, it could be a question of that I need to shrink my budget of my training, and the training would not happen, or it can only happen in this format, which is the most cost effective.

According to the interviewees, the travel budget in their organizations has been cut by an average of 30% to 50%. Table 12 shows the percentage by which business travel budgets have been cut in different organizations since the economic crisis started in 2008. However, the researcher did find an outlier among the samples.

According to one sales manager, the company actually conducts more business travel due to business growth. One possible reason is that this company is in the manufacturing/food/retail industry. Our need to eat usually will not change dramatically or suddenly, which gives relatively more opportunities for companies in this industry to develop or maintain their business, even under an economic downturn. But it could also be just an exception, and might not be representative of all companies in the same industry category.

Table 12 Percentage of Business Travel Budget Cuts Since 2008

Industry category	Work function	Budget cut %
Insurance	IT manager	50
Finance	Director of risk management	>50
Networking and telecommunication	Sr. technical manager	55-60
IT practice	IT manager	25
Manufacturing/food industry/ retail	Corporate sales manager	0
Pharmaceuticals	North America audit manager	30

It seems clear that when people are trying to grow the profit margin or when they are forced to cut expenses, they tend to adopt e-conferencing as an alternative to traveling. Furthermore, e-conferencing has been proven effective in terms of money saving.

Interaction.

The concept of interaction comprises two aspects, professional interaction and social interaction. Professional interaction stands for the interpersonal interactions, relationship building, and network building that will benefit one’s professional future, such as business opportunities. Social interaction more refers to people’s personal socializing activities.

This study found that people are satisfied with e-conferencing that enables them to interact with more people by including more people in a conference. People believe that e-conferencing improves their ability to build professional relationships and widen their networks. In addition, it helps people build long-lasting professional relationships. People use e-conferencing to maintain relationships they have built in face-to-face

interactions, which turns out to be very effective. However, when it comes to social interactions, people's opinions tend to be negative, which will be discussed in the next section—concerns and problems.

Summary.

People usually adopt new technology for very simple reasons, such as the technology can help them to improve their efficiency or productivity, they can gain competitive advantages by implementing the specific technology, or industry trends push them to keep up with updated technology. People adopt e-conferencing mostly because they can get lots of benefits from it, such as improving work efficiency, effectiveness, productivity, cost efficiency, and so forth. Additionally, due to the ease of use in e-conferencing, people can get these benefits with a low barrier.

The degree to which people are satisfied by the technology then determines whether they will keep using it or stop using it. Table 13 presents people's satisfaction of using different formats of e-conferencing. The level of satisfaction was rated with a five-point Likert scale. All the numbers in the weighted average column are greater than 2.5, indicating that generally people are satisfied with e-conferencing. Among the formats, audio conferencing satisfies people most, followed by web conferencing, video conferencing, and then total virtual conferencing.

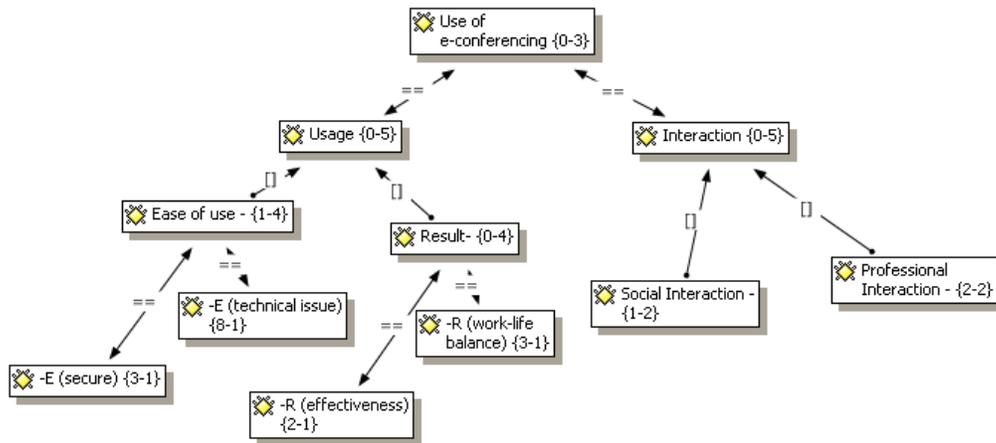
Table 13 Satisfaction With Use of E-Conferencing by Formats (Number of Response)

	Weighted average	Not at all satisfied (1)	(2)	(3)	(4)	Very satisfied (5)	NA
Audio Conferencing (Without Video and Real-Time Document Sharing Capabilities)	5.4				3	3	
Web Conferencing (Only Audio and Real-Time Document Sharing Capabilities)	5.2			1	2	3	
Video Conferencing (Without Real-Time Document Sharing Capabilities)	3.7			2		1	3
Total Virtual Conferencing (Includes Audio, Video and Real- Time Document Sharing Capabilities)	3			2			4

In sum, anecdotal evidence in Table 13 and the consistent increase in sales of e-conferencing technology described in the press demonstrate that people are satisfied overall with e-conferencing. An obvious trend is that e-conferencing will play an important role in more organizations and for a significant period of time. Any changes in e-conferencing will involve improvements in the technology to maximize advantages and minimize the faults.

Negative Attributes of E-Conferencing.

No technology is perfect, and e-conferencing is no exception. From the interviews, researchers found that people have many concerns and have encountered different problems with e-conferencing. The concerns and problems are primarily confined to the technical and interaction areas. In the main coding system (Figure 10), there are several codes that have a “-” at the end. These indicate where the concerns and problems are located. To make it simple, a structural view of concerns and problems was drawn out from the main coding system, as shown in Figure 13 and Table 14.



Key to the relation symbols: == “is associated with”; [] “is part of”

Figure 13 Negative Attributes of E-Conferencing

Table 14 Codes and Meanings for Negative Attributes of E-Conferencing

Codes	Meanings
-E (technical issue)	Negative response relevant to technical issues
-E (security)	Negative response relevant to security issues
-R (work-life balance)	Negative response relevant to the impact on work-life balance
-R (effectiveness)	Negative response relevant to work effectiveness

Technical Issues and Security Issues.

People encountered problems in both the ease of use and results. For example, a major frustration with e-conferencing comes from technical issues, such as bandwidth issues, connectivity issues, and so forth. All the interviewees agreed that the technical challenge of connectivity had been a big concern for them. Some examples from the transcripts are as follows:

I think it's [e-conferencing] really cool, very interesting. But let's say 70% of the time, it does not work right.

And:

Yeah, it can be the technical issues and people are not familiar with the technologies and don't know how to use it. And then like I've mentioned about the interviewing, sometimes there is the bandwidth challenge that there is a time delay. So that has been a challenge going with some interviews.... It has been a number of times that we have problems just for the whole audio, so we were able to see them they can't hear us, or we cannot hear them or vice versa.

In addition, people also believe that the technical issues such as bandwidth sometimes can become a major barrier that stops them from implementing certain technologies, for instance, Telepresence. As one interviewee explained,

One of the challenges of Telepresence is that Telepresence is like high definition television, which is typically at the all the bandwidth level which is taking something like 1.5 tbps of bandwidth. No customer typically has that kind of bandwidth, and it is very expensive.

Another concern people have regarding the use of e-conferencing is security. Most of the interviewees had concerns about security of the data during delivery or real-time sharing. Although the degree to which connections are secure or not somewhat

depends on the security level that has been set up on both sides, sometimes problems in connectivity and delivery occur if the security level has been set too high. Then security becomes a trade-off that people have to accept.

Work-Life Balance and Work Effectiveness Issues.

As I have mentioned, e-conferencing helps people improve their work-life balance by providing increased flexibility in terms of locations in which to work. However, there are two sides to every coin. By increasing the work location flexibility, people feel compelled to work more. For example, with easy access to work, people sometimes work outside of office hours. With the availability of e-conferencing, people tend to participate in more meetings than ever before. Then this flexibility becomes another trade-off people have with advanced technology. The interviewees expressed concerns such as the following:

With all the technologies, I get phone calls at 11 o'clock at night or 5 o'clock in the morning.... It definitely helped me, but it also makes me more accessible to work. It's like you know I am continuously working for 24 hours. It is kind of trade-off.

Another interviewee said,

I don't think it actually helps in balancing work and personal life, it doesn't improve personal life....

Although people believe in e-conferencing in terms of work effectiveness overall, in some specific areas, concerns still exist. One major concern is with keeping the attention and concentration of the information receivers. Unless e-conferencing is conducted at a videoconferencing level, people do not physically meet one another and

they do not know what exactly the people on the other side are doing. People might be distracted by other programs on their computers, by their cell phones, or by the other people around them, all of which can result in ineffective training or communication. One of the interviewees provided the following example:

... We do notice this, if I am on the phone with a buyer, he is doing his email, and he is texting somebody, it is like the chance of me getting 100% of his thought process is 0.

Low Interaction Level

A lot of people are satisfied with e-conferencing for building and maintaining professional interactions, however, it is important to note that significant concerns with professional interactions and social interactions exist. People sometimes feel that a relationship cannot reach a certain level until they meet in person, at least once. In addition, meeting virtually with e-conferencing does not provide the opportunity for people to socialize with one another after the meeting, which limits the development of professional relationships as well as personal relationships. Salespeople especially have this concern, which will be discussed more in the section on the relationship between meeting formats and work functions.

Conferencing Formats and Meeting Types

A comprehensive list of meeting types was drawn from the literature review performed for this study. Interviewees were encouraged to present their personal/professional opinions on the best formats of e-conferencing (face-to-face interaction; audio conferencing without real-time document sharing; web conferencing with audio and real-time document sharing; video conferencing with audio but without

real-time document sharing; and total virtual conferencing with audio, video, and real-time document sharing) to fulfill the purposes of different types of meetings. The results are shown in Table 15.

Table 15 Best Matching Meeting Approaches and Meeting Types

	Face-to-face interaction	Audio conferencing (without video and real-time document sharing capabilities)	Web conferencing (only audio and real-time document sharing capabilities)	Video conferencing (without real-time document sharing capabilities)	Total virtual conferencing (includes audio, video, and real-time document sharing capabilities)
Business development	5	4	1	1	
Sales calls	3	2	1	2	
Meetings with customers/suppliers	4	3	1	1	
Customer service/service call		1	3		
Technical problem solving	1	2	2	1	1
Trade shows	1		1		1
Industry meetings/Industry Association meetings	5	1	4	1	2
Internal company business	2	5	2	1	1
Employee training	3	1	4		2
Sales department meetings		2	2		1
Visits to manufacturing sites	3				
Top management meetings	4	1		3	1
Project management	2	4	1		
Conferences/seminars	2		3	1	3

Table 15 illustrates the appropriate conferencing formats for each type of meeting under ideal conditions. Each number underneath each format stands for the times it had

been selected for the corresponding meeting type. Interviewees were allowed to select multiple formats for each meeting type. Interviewees made the choices based on their well understanding of each formats.

It is important to point out that when it comes to the “economic downturn” condition, most interviewees had reduced the use of the face-to-face interaction format and emphasized that although face-to-face interaction is still the best approach for some types of meetings, those kinds of meetings are kept to a minimum. For example, when asked how the use of business travel has changed, one interviewee expressed,

Everything now is almost zero travel, no travel, near zero.

The video conferencing format is the least chosen format for meetings, with the exception of top management meetings. One reason for this phenomenon is that there is usually no need to see the people on the other side of the call, as this interviewee explained:

Video conferencing is very rare. There is no need to see each other. So it is very rare. ... Unless I am a big shark, nobody would like to see me right? Ok? So in a company, if you are doing video conferencing, it will only make sense when there is a representative [who] wants to meet with you from another company, who are [of] high value to you, then you will do video conferencing. To us there is no need. We are just IT.

And another commented,

... We do without the video, because we normally do not require the video and we know the person who is talking extremely well. ...

Another reason for the low usage of video conferencing is the extent of video conferencing availability in an organization. Unless all sides have a video conferencing

facility available and the will to connect at a virtual face-to-face level, most conferences are confined to audio only. For example, one interviewee said,

...With the various sides, you know, depending on the sides. [If they] have the functionality it actually means that connectivity [is at] a different level because now you can actually see the face of the person. And you can actually ... as far as how many sides would actually have that but whichever sides have that functionality, yes, it is used. But in my side, it's...not available much so I barely use that, I mean, but you know, it is one of the things that you don't keep that much technology if you don't do it much, you know, I am not even sure it is functional right now.

Bandwidth is also a concern when it comes to using video conferencing. High definition video conferencing requires high bandwidth that can be very expensive. Therefore, bandwidth will impact the quality of the meeting as well as the cost, which is frustrating for users of video conferencing. One interviewee explained,

There are lots of people [who don't] use the video even though it's available. And with video means you are talking about 138 kbps bandwidth ... Video con ... you know most of the times we do have issues of bandwidth, we do have issues of connectivity.

And another expressed,

Technical problems are typically on the bandwidth issue [associated with] video conference. For example, I can tell you in the last week, two weeks ago, we were trying to fix a videoconference with [company], ...multiple locations as well. They want to talk to people who are in Brazil and some other place. It didn't work, all because of bandwidth issues.

It is important to note that opinions on video conferencing are diverse and depend on work function. With work that requires a high degree of interpersonal interaction, people tend to want the functionality of video rather than just voice in order to increase

the level of interaction during the meeting. This condition pertains mostly to customer-involved meetings and high-level management meetings.

In task-oriented work, people have no desire to see one another's faces as long as the problem can be solved or the task can be fulfilled. There are some people who believe that video conferencing is a fascinating tool that can bring considerable improvement to a plain audio conference, however, due to availability issues, they barely know how it functions and use it rarely or never.

Conferencing Formats Vary by Meeting Types.

From Table 15, it is very easy to see that the most selected formats vary significantly when the meeting types change.

Face-to-Face Interaction Is Most Desirable.

Face-to-face interaction is still the most desirable format for most meeting types (7/13). For business development and industry meetings/industry association meetings, five out of six interviewees put face-to-face interaction as the best format. Face-to-face interaction is also in a leading position for meetings with customers/suppliers and top management meetings. Most of the interviewees pointed out that there is a significant difference between meeting with customers and meeting with suppliers. For example, meetings with customers are driven by the customers' needs. But in meetings with suppliers, the interviewees have more power in deciding the meeting formats. Therefore, if it's necessary to cut costs, meetings with suppliers will be conducted virtually more often.

For top management meetings, face-to-face interaction is closely followed by video conferencing, which illustrates that visual interaction is important for top management. Interviewees also explained that the choice of format primarily depends on top management's preference and then on the frequency of meetings and the distance between the top management members. Basically, the more frequent the meetings, the more virtual those meetings will be. If meetings are hosted annually or semi-annually, then probably they will be conducted face-to-face. If top management members are in close proximity, then meetings will probably be conducted face-to-face. If the attendees are very far from one another, for instance, in different countries, then virtual meetings will be adopted.

Web Conferencing Is the Best-Evaluated of Virtual Conferences.

The second most popular meeting format is web conferencing (6/13). In fact, web conferencing is the best-evaluated virtual conferencing format. Several of the interviewees emphasized that it generates favorable results, especially in terms of technical problem solving (remote control) and employee training. In addition, the function of document sharing/screen sharing enables users to fulfill their work more efficiently and adds value to web conferencing format. For example, the IT manager for an insurance company had the highest evaluation of the web-conferencing format:

It [Web Conferencing, Only Audio and Real-Time Document Sharing Capabilities] is enough for all my needs.... With the real-time document sharing, one guy would be sharing his desktop; we will be sharing all the stuff.... 95% of the cases were done remotely, and successfully. You just share the stuff, that's it. In fact, IT seniors will never be, you know, upset.

Another example of this kind of evaluation came from a risk management director in the finance industry:

I will say I am more satisfied with the training concept of...going online and going in a technology field of it. And it can show that my folks, my team and my company, [are] giving the best tools available to employees so they can do a better job. Others are not able to provide that information all together.... I'm actually very very supportive of the web tools from the way we use it where we have audio and real time connectivity from the presentation perspective.

Due to the popularity of computers and the Internet, as well as the choice of web conferencing tools available, web conferencing has become a more and more common intra- and inter-organization communication method. To some extent, its capabilities and ease of use increase the efficiency of work. It has been proven very effective in terms of cost and time saving, not to mention the convenience it brings to people during their work. By combining audio and web-based real-time document sharing, people are able to make greater achievements than ever before.

Audio Conferencing Is Most Frequently Used.

Interviewees claimed audio conferencing was the most frequently used format in their daily work. From Table 16 we can see that among all e-conferencing formats, audio conferencing is highly rated as a regularly used (weekly to daily) tool for external and internal organization communications. Several reasons were given for this.

Table 16 Frequency of Use of E-Conferencing by Formats (Number of Responses)

	Never use	Use rarely (every 6 months to a year)	Use occasionally (once every month)	Use regularly (once weekly to daily)
Audio conferencing (without video and real-time document sharing capabilities)				6
Web conferencing (only audio and real-time document sharing capabilities)	1	1	1	3
Video conferencing (without real-time document sharing capabilities)	1	2	2	1
Total virtual conferencing (includes audio, video, and real-time document sharing capabilities)	3	1	1	1

First, audio conferencing has low facility requirements (it's cheaper), basically a phone line and a nice telephone. One interviewee had this to say:

...Maybe telephone is not all of what you are calling e-conferencing, but whatever you live is by telephone.... All organizations would have the telephones as well as...you know...some kinds of vocal tools we actually use to connect to each other.

Second, it is easy and quick to conduct a meeting. Third, there are fewer technical issues that meeting organizers or participants might encounter. Last but not least, the result of the meeting is usually favorable. For example, when asked about satisfaction with the audio conferencing format, one interviewee gave a score of four out of five, explaining:

...Not perfect, but works.

In sum, audio conferencing is the most widely used e-conferencing format for breaking the geographical barrier and fulfilling the purpose of a relatively simple and quick meeting.

Conferencing Formats Vary by Industry.

In addition to meeting type, industry category and work function are major influences when it comes to determining the conferencing format. Table 17 presents the variety of conferencing format choices by industry and work function. The numbers stand for the number of meeting types for which interviewees had chosen a certain conferencing format. The numbers before and after the slash stand for the choices under ideal conditions and under economic downturn conditions, respectively. For example, “5/9” (first row, second column) means that among the 13 meeting types, the interviewees believed that ideally, five of them are better done by audio conferencing; in an economic downturn, nine types of meeting can be fulfilled this way.

Table 17 Meeting Formats Vary by Industry and Work Function

Industry category	Work function	Face-to-face interaction (ideal/downturn)	Audio conferencing (without video and real-time document sharing capabilities) (ideal/downturn)	Web conferencing (only audio and real-time document sharing capabilities) (Ideal/Downturn)	Video conferencing (without real-time document sharing capabilities) (ideal/downturn)	Total virtual conferencing (includes audio, video, and real-time document sharing capabilities) (ideal/downturn)
Insurance	IT manager	5/5 (but minimum)	5/9	10/9	2/4	6/5
Finance	Director of risk management	2/0	5/5	4/3		
Networking and telecommunication	Sr. technical manager	4/1	1/0	10/6	3/1	
IT practice	IT manager	3/3 (20% declined)	2	5	5	1
Manufacturing/food industry/retail	Corporate sales manager	11/11	4/4	1/1		
Pharmaceuticals	North America audit manager	10/10	6/6	2/2	1/1	5/5

From Table 17, it can be seen that meeting format preference varies dramatically between industries, for example, between cutting-edge IT industries and other industries, as well as between non-IT industries. A significant difference exists between the IT industry and non-IT industries. It can be demonstrated that the IT industry tends to have more meetings virtually than non-IT industries do, regardless of the type of meetings.

There are several reasons for this difference. First, people who work in the IT industry are more comfortable with technology. Not only do they know technology better and trust it more, but also they are more capable of technical trouble shooting. Second, the IT industry is more resourceful with technology. For example, according to the interviewee from the IT service industry, 30% to 50% of their locations have Telepresence capabilities; the interviewee from the IT practice industry claimed that they have 14 Telepresence units across the world. Last, for people in this industry, using technology is the best way to show their business capabilities. For instance, in order to sell IT services or solutions to customers, they sometimes invite customers to their advanced e-conference rooms near customers' locations to have virtual meetings with them, so that customers can experience the quality of the service and technology the company is supplying and increase the confidence of the customers.

In contrast, non-IT industries tend to rely on e-conferencing technology less. They consider e-conferencing to be a plus. Instead of passionately pursuing various advanced e-conferencing technology, they are satisfied with e-conferencing as long as the technology works when it is needed or when they encounter difficulties with traditional approaches. The more the industry is differs from IT, the more obvious this phenomenon

is. Table 17 also illustrates that preferences in conferencing formats vary between non-IT industries. For example, comparing the responses from the risk management director in finance, the corporate sales manager in manufacturing/food industry/retail, and the audit manager in pharmaceuticals, it is interesting to note the diversity of choices. By looking into it closely, it is discovered that although it is not directly related to IT, IT plays a bigger part in the finance industry, especially risk management. The manufacturing/food industry/ retail and the pharmaceuticals industries are dramatically different from IT; they show a higher preference for interpersonal interaction.

Conferencing Formats Vary by Work Function.

As mentioned earlier, work function can be broken down into two broad categories: work that requires interpersonal interactions and task-oriented work. For example, in this study, IT manager, risk management and technical manager are task-oriented; their goal is to accomplish assignments, such as designing systems, risk analysis, and technical problem solving. As one of IT manager described the job,

If you are going there to sign a business deal, maybe it [face-to-face interaction] will make sense. But IT managers, the way we work is different. If the business manager needs to sign a deal, of course he will definitely rely on face-to-face. And for him, all the electronic ways of communication will always be secondary. But for IT managers, whose job is to accomplish a goal, for me, it makes perfect sense. If you look at the entire process, the...sales deal is the initial part of a business transaction. It is 5 to 10% of the business. But once you get the order, what follows after that is 90%, [which] can be done remotely.

However, jobs like sales manager and audit manager involve more interactions with people, especially sales. Therefore, when it comes to deciding the way to “meet” people, these functions show higher interest in face-to-face interaction or formats that

enable more interpersonal interactions, and they truly believe in its effectiveness. Table 17 shows the phenomenal difference between these two categories and the others in terms of conferencing format preference. The sales manager and the audit manager selected more than 10 types of meetings to be done by face-to-face interactions, while the rest selected significantly fewer (less than five).

The transcripts demonstrate the uniqueness of the sales function in terms of conferencing format:

Sales call has to be face-to-face; there is no [better] way, so it is still face-to-face. Meeting with customers is also face-to-face, followed by maybe audio conferencing. You know if somebody tries to sell you something, you won't say OK, I will turn on my computer, I'll turn on the conferencing, nobody wants to do it. Through the phone may be OK, but face-to-face is still number one.

Also,

My personal relationship with people is that a lot of stuff we do we have a meeting and we have dinner afterwards, lunch afterwards, and that stuff, a lot of the ideas, a lot the changes we did implement among sales people [occur] over dinner so there is no way in my mind to duplicate that over computer and so for at least right now I feel like our sales team is probably not gonna embrace the e-conference too much just because we want our personal relationships.

In sum, the choice of conferencing format is highly associated with meeting type and purpose. The category of the industry, and the work function, are secondary influences on conferencing format preferences, even when it comes to the same type of meeting. It is understandable that different industries and work functions would have unique emphases that determine the level of relevancy between their work and different meeting types, which then cause the diversity of preferences. However, with all the

influences, a pattern still can be deduced from the research. From Table 17, the most preferred conferencing format(s) for different meeting types can be described, as shown in Table 18.

Table 18 Most Appropriate Conferencing Format by Meeting Type

Meeting type	Preferred conferencing format
Business development	Face-to-face interaction
Sales calls	Face-to-face interaction
Meetings with customers/suppliers	Face-to-face interaction
Customer service/service call	Web conferencing
Technical problem solving	Audio conferencing; web conferencing
Trade shows	Face-to-face interaction; audio conferencing; total virtual conferencing
Industries meeting/Industry association meetings	Face-to-face interaction
Internal company business	Audio conferencing
Employee training	Web conferencing
Sales department meetings	Audio conferencing; web conferencing
Visits to manufacturing facilities	Face-to-face interaction
Top management meetings	Face-to-face interaction
Project management	Audio conferencing
Conferences/seminars	Web conferencing; total virtual conferencing

Table 18 shows that face-to-face interaction is most suitable for business development, sales calls, meetings with customers/suppliers, trade shows, industry meetings/industry association meetings, visits to manufacturing facilities, and top management meetings. Audio conferencing fits well with technical problem solving, trade shows, internal company business, sales department meetings, and project management. Web conferencing is considered appropriate for customer service/service

call, technical problem solving, employee training, sales department meetings, and conferences/seminars. Finally, total virtual conferencing is believed to fulfill the needs of trade shows and conferences/seminars best.

In addition, it is worthwhile to point out that when applying this pattern to practice, it has to be adjusted according to the characteristics of the industry and work functions.

Chapter 5

CONCLUSIONS AND IMPLICATIONS

According to the review of previous studies, four e-conferencing formats emerged from various e-conferencing applications according to their functionalities, namely audio conferencing, web conferencing, video conferencing, and total virtual conferencing. These four e-conferencing formats, as well as face-to-face interaction, were investigated for how they fit the needs of different types of meetings.

When it comes to deciding on the best conferencing format for different types of meetings as an alternative to business travel, the results vary dramatically according to meeting type, industry category, and work function. The findings prove that there is no simple or absolute substitution relationship between e-conferencing and business travel. When the meeting requires less interpersonal interaction, then the degree to which e-conferencing can replace face-to-face meetings is higher, and vice versa.

Although e-conferencing is not entirely supplanting business travel, it does have a phenomenal impact on it. The study found that due to the availability of advanced e-conferencing, when it comes to travel decisions, people always consider e-conferencing as an option. Effectiveness is evaluated before the decision is made. For example, if the purpose of the meeting cannot be fulfilled through e-conferencing or the effectiveness will be negatively impacted, then the decision will be to stay with travel. Otherwise, probably the meeting will be conducted through e-conferencing. For some specific types

of meetings, such as business development or sales calls, the face-to-face meeting will be where the future of business travel comes from.

Another important factor is the economy. Although the findings demonstrate that people adopt e-conferencing and keep using it largely due to the benefits they can get from it, such as the convenience it brings to their work, increased work efficiency, and cost savings, the economy is an external factor that always has an effect on business travel decision making. For example, during an economic downturn, when an organization requests that its departments cut expenses, people have to find a lower cost alternative in order to continue their work, and e-conferencing has proved to be very helpful. In this case study, most organizations had cut their business travel budgets due to the economic crisis, which then pushed them to rely on e-conferencing as a cost-saving alternative to face-to-face interactions. The economy is not the only factor that will impact business travel decision making, but it is absolutely an important one.

In the short term, given the impact of the economic crisis, e-conferencing tends to substitute for business travel. However, in the long term, it will be more of a complement to business travel. When the economy recovers, it is reasonable that people will still start to travel again for the best fulfillment of their business goals. Yet, the economic downturn has accustomed people to doing more with less. Hence, with an economic recovery, e-conferencing will be used as a complement in some meetings for convenience and cost efficiency to get equivalent even better results.

In sum, this study explored the use of e-conferencing and identified factors that cause an increase in e-conferencing adoption. The results of this study will benefit e-

conferencing solution/service providers, business users, and academics. This research can help e-conferencing solution/service providers identify product faults, so as to assuage people's concerns about using e-conferencing. For business users, this study provides information about e-conferencing technology and relationships between meeting types and different conferencing approaches, which will help optimize the decision-making process. Last but not least, academics can use the results of this research as a resource and keep seeking changes in the relationship between e-conferencing and business travel.

Chapter 6

LIMITATIONS AND FUTURE STUDY

Every research has its limitations; this is not an exception. The first limitation of this study arose from the sampling procedure. The industries selected for this study are, to some extent, overlapping, and the positions of the interviewees were mostly at the support level. In future studies, the industries should be selected more purposefully and the individuals should be more at the corporate level instead of support level.

The second limitation is the timing of the research—under economic crisis. The state of the economy was an extremely strong influence, and the results might be skewed in regard to the impact of e-conferencing on business travel decision making. The implication is that it is necessary to conduct similar research under normal stable economy conditions and under flourishing economy conditions.

In addition, when it comes to negotiating with suppliers, the degree to which a business can leverage a discount by conducting e-conferences instead of having the suppliers travel around can be further studied.

APPENDIX

Questionnaire: E-Conferencing Tools and Their Impact on Business Travel Decision Making

	E-Conferencing Tools and Their Impact on Business Travel Decision Making
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Thank you very much for taking the time to respond to this very important study examining the impact of e-conferencing tools on business travel decision-making. The survey is voluntary. It will take about 8-12 minutes of your time to complete.

1. Are you currently employed?

Yes No

2. In what industry are you currently employed?

- Agriculture, forestry, fishing and hunting, and mining
- Construction
- Manufacturing
- Wholesale trade
- Retail trade
- Transportation
- Finance, insurance, real estate, rental, and leasing
- Professional, scientific, management, administrative, and waste management services
- Educational, health, and social services
- Arts, entertainment, recreation, accommodation, and food services
- Other services (except public administration)
- Public administration

3. Please indicate the category of your functional line of work:

- Administration
- Advertising, marketing & PR
- Animal & plant resources
- Arts, design & crafts
- Construction & property management
- Counseling, social & guidance services
- Economist, statistician etc
- Education, teaching & lecturing
- Engineering
- Finance, insurance and pension & actuarial work
- Health care
- Hospitality
- Human resources & employment
- Information services
- Information technology
- Law enforcement & public protection
- Legal services
- Leisure, sports & tourism
- Logistics & transport
- Management consultancy
- Manufacturing & processing
- Natural resources & the environment
- Publishing, media & performing arts
- Sales, retail & buying
- Scientific services
- Other

4. Please indicate the number of employees in your organization worldwide?

- Less than 150
- Between 151 and 500
- Between 501 and 1,000
- Between 1,001 and 5,000
- Between 5,001 and 10,000
- Greater than 10,00

5. Your organization has offices in the following regions. TICK ALL THAT APPLY.

- North America South America Europe Middle East Asia Pacific
- Africa

6. Does your organization use e-conferencing tools as a way to meet and do business?

- Yes No

7. How familiar are you with the following terms/technologies?

	Not familiar (1) ←	(2)	(3)	(4) →	Very familiar (5)
A. Webinar	<input type="checkbox"/>				
B. Telepresence	<input type="checkbox"/>				
C. Webcast	<input type="checkbox"/>				

8. Please indicate your frequency of use of the following e-conferencing formats.

	Never Used	Use Rarely (Every 6 Months to a Year)	Use Occasionally (Once Every Month)	Use Regularly (Weekly Once to Daily)
A. Audio Conferencing (Without Video and Real- Time Document Sharing Capabilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Web Conferencing (Only Audio and Real- Time Document Sharing Capabilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Video Conferencing (Without Real-Time Document Sharing Capabilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Total Virtual Conferencing (Includes Audio, Video and Real- Time Document Sharing Capabilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Please indicate your level of satisfaction with the quality of the e-conferencing formats in helping you achieve the objectives of business meetings.

	← Not at all satisfied (1)	(2)	(3)	(4)	→ Very satisfied (5)
A. Audio Conferencing (Without Video and Real-Time Document Sharing Capabilities)	[]	[]	[]	[]	[]
B. Web Conferencing (Only Audio and Real-Time Document Sharing Capabilities)	[]	[]	[]	[]	[]
C. Video Conferencing (Without Real-Time Document Sharing Capabilities)	[]	[]	[]	[]	[]
D. Total Virtual Conferencing (Includes Audio, Video and Real- Time Document Sharing Capabilities)	[]	[]	[]	[]	[]

10. In my line of work, for the various types of meetings (listed in rows), the following conferencing formats (listed in columns) are used. TICK ALL THAT APPLY for each meeting type.

	Face-to-face interaction	Audio Conferencing (Without Video and Real-Time Document Sharing Capabilities)	Web Conferencing (Only Audio and Real-Time Document Sharing Capabilities)	Video Conferencing (Without Real-Time Document Sharing Capabilities)	Total Virtual Conferencing (Includes Audio, Video and Real-Time Document Sharing Capabilities)
Business development	[]	[]	[]	[]	[]
Sales calls	[]	[]	[]	[]	[]
Meetings with customers/suppliers	[]	[]	[]	[]	[]
Customer service/ service call	[]	[]	[]	[]	[]
Technical problem solving	[]	[]	[]	[]	[]
Trade shows	[]	[]	[]	[]	[]
Industries meetings/Industry association meetings	[]	[]	[]	[]	[]
Internal company business	[]	[]	[]	[]	[]
Employee training	[]	[]	[]	[]	[]
Sales department meetings	[]	[]	[]	[]	[]
Technical problem solving	[]	[]	[]	[]	[]
Visits to plants	[]	[]	[]	[]	[]
Top management meetings	[]	[]	[]	[]	[]
Project management	[]	[]	[]	[]	[]
Conferences/ Seminars	[]	[]	[]	[]	[]

11. Please rank from the following e-conferencing formats based on your frequency of use? (1 refers to the highest frequency, 4 refers to the lowest frequency)

- Audio Conferencing (Without Video and Real-Time Document Sharing Capabilities)
- Web Conferencing (Only Audio and Real-Time Document Sharing Capabilities)
- Video Conferencing (Without Real-Time Document Sharing Capabilities)
- Total Virtual Conferencing (Includes Audio, Video and Real- Time Document Sharing Capabilities)

12. Consider e-conferencing as an alternative to business travel. Please state your agreement with the following statements.

	Strongly DISagree (1)	← (2)	(3)	(4)	(5)	(6)	→ Strongly AGree (7)
Easy to set up meetings with participants at multiple locations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to share rich information such as files, multimedia etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Easy to record data, material and discussion points of meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enhance the overall productivity of the business unit when used over a long period	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reduces overall travel costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enables one to get things done efficiently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enables one to get things done effectively	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decision-making is easy and quick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improves my ability to interact with more people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improves my ability to build professional relationships, widen my network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helps me build long-lasting professional relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The challenge of planning and coordinating meetings is a real concern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helps to improve the work-life balance overall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. In percentage terms, as a result of the economic downturn, travel budgets in my organization have reduced by _____ %?

14. Lastly, please answer the following questions. Place a tick (✓) in the box next to the answer choice.

A. Age: 18 – 25 26 – 33 34 – 41 42 – 49 50 – 57 > 58

B. Gender: Male Female

C. Education: High School Associate Degree Bachelor's Degree Post Graduate Other



Thank You for Taking the Time to Complete This Survey

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