

TRAVEL OR TECHNOLOGY? BUSINESS FACTORS INFLUENCING MANAGEMENT DECISIONS

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Abstract

There is an on-going debate on the use of technology as an alternative to business travel, with industry and academia differing in their views on such substitution. This study investigates the trend towards substitution and identifies the factors and barriers that play a role in either supporting or limiting such substitution. The results provide management with an evaluation of the benefits of replacing business trips with videoconferencing and other alternatives, against the potential disadvantages of using these alternatives.

Key words: business travel; corporate travel management; videoconferencing; teleconferencing; web conferencing

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1

Introduction

Business travel is a significant sector in the overall tourism market accounting for about 15 per cent of all tourist arrivals (UNWTO, 2008). Although organisations are increasingly facing the need to interact with distant partners (Aguilera, 2008), this does not necessarily require physical travel. According to Cramton (2001) the way in which groups are organised and their means of communication to support their work are changing. Communication and collaborative technologies have developed to such an extent that it has now become feasible for groups to work together even though their members are physically dispersed. Cramton (2001:346) describes geographically dispersed teams as 'groups of people with a common purpose who carry out interdependent tasks across locations and time, using technology to communicate much more than they use face-to-face meetings.' Many relationships can be built and maintained through mediated communications such as telephones, emails and videoconferences. In fact, according to Wang and Law (2007) information and

communications technologies (ICTs) offer people a substitute for face-to-face contact and thus have the ability to replace physical travel. Today, some companies even make it compulsory for an employee to motivate their need to travel rather than using their company's implemented videoconferencing system (Brightcom, n.d.). At the same time constraints exist because technology is not yet optimal as a substitution for face-to-face meetings or could be too costly to implement. According to Cramton (2001) research relating to the sharing of information amongst groups and the effect that media might have on those groups poses questions about the possibility of success under dispersed and technology-mediated settings. Denstadli (2004) and Mason (2002) found that technologies such as videoconferencing had not had a significant influence on the number of business trips undertaken, although in 2002 Mason predicted that ICTs would advance sufficiently to permit some substitution in the future (Mason, 2002). A further consideration is the growing concern for the environment and the impact of travel on the environment, which suggests that more studies should be conducted to determine the

extent of substitution and the circumstances under which such substitution can take place.

The overall purpose of this paper is to gain a greater understanding of the factors that influence organisations in their choice between physical travel undertaken for face-to-face meetings and the use of technology such as video- or teleconferencing as a substitution. The paper focuses on the so-called business-driven factors that may have an influence on management decisions, for example the cost of travel, decreasing the carbon footprint of the business, and ensuring the safety of business travellers. The paper does not cover personal motivations for business travel (for example the desire for a business traveller to experience new cultures, meet new people or break away from normal work routine). More specifically, the paper identifies the type of business interaction that is appropriate to the use of technology as a substitution for face-to-face meetings and would overcome the problems inherent in the communication of geographically dispersed teams, the constraints that affect the use of technology as an alternative to business travel, and finally the extent to which technologies are currently being used as an alternative to business travel. In this study South Africa was chosen as the research setting. Research from both industry and academia suggests that there is increasing use of technology as an alternative to business travel in Europe and the USA (American Express, 2003; Face-to-face meetings still beat Web teleconferencing, 2006; Robart, 2008; Wainhouse, 2004). As far back as 1995, Burger estimated that videoconferencing alone could reduce the need for business travel by as much as 40 per cent, depending on trip distance and purpose (Roy & Filiatrault, 1998), while more recently researchers predicted that video meeting applications will substitute 2.1 million airline seats yearly by 2012, costing the travel and hospitality industry US\$3.5 billion per annum (Alves, 2009). The videoconferencing market has grown considerably in the past 20 years, growing fivefold in the period from 1991 through to 2006 (Denstadli & Gripsrud, 2010) to a total value of \$1.06 billion (Denstadli, Julsrud & Hjorthol 2012: 70).

A number of factors set South Africa apart

from other countries. Firstly, telecommunication costs in South Africa are still very high, and this might be a barrier to the implementation of ICT alternatives. Furthermore, it seems that some South African companies are convinced that face-to-face meetings are still superior to virtual ones and that these companies are travelling more than ever before (Hurley, 2011; Muller, 2011). It was thus necessary to determine whether South Africa is following the rest of the world in terms of technology usage to replace business trips, or whether these distinguishing factors are causing South Africa to lag behind in terms of technology adoption. The paper begins by providing an overview of the main types of travel alternatives available in the market and their viability in achieving the objectives of business meetings. Thereafter the factors influencing the use of technology as an alternative to business meetings are identified from a theoretical perspective. The importance of these factors is tested empirically by selecting managers with travel portfolio responsibilities in corporations, travel management companies and travel suppliers in South Africa. The methodology section covers the sampling and data analysis techniques used. Finally the results of the research study are explained and the paper concludes with a discussion of these results and the potential for future research on this topic.

2

Types of technology available as a substitute for business meetings

Teleconferencing, web conferencing and videoconferencing appear to be the most viable alternatives to travel (Wainhouse Research, 2004). According to Enbysk (2008) *teleconferences* are the ideal communication tool for sharing straightforward information and making simple decisions that need no visual presentation. But they are not the appropriate way to discuss more complex matters, which could be presented more appropriately via web conferencing. Teleconferencing is also not a desirable way to start or even advance a vital business relationship. Another tool that is becoming increasingly important as a substitute for business travel is *web*

conferencing, which, according to *The Economist* grew by 40 per cent in 2003 (Business: Being there; Virtual meetings, 2004). According to Enbysk (2008) web conferencing can be explained as videoconferencing without the video – or alternatively – teleconferencing but adding the web for interactive presentations by using Powerpoint, Excel or other documents. Still, web conferencing cannot compete with face-to-face meetings since, unlike videoconferencing, the audience's facial expressions and body language cannot be observed. However, for simple business plan reviews, sales meetings and software demonstrations web conferencing remains a viable alternative to travel (Enbysk, 2008).

Videoconferencing can be summarised as an interactive application of video, computing and communication technologies to permit people, either one-on-one or in groups of up to 12 people, in two or more localities, to convene without actually being together (Enbysk, 2008). The ability of the media to facilitate several information cues at the same time, provide speedy response and establish a personal focus is referred to as the “richness of the media” and is a determining factor in the type of content that the media can be used for. Although media with low richness can be used to facilitate routine activities, richer media is more suitable for non-routine activities and ambiguous communication. Communication failure happens when the medium is not rich enough for the content. Videoconferencing is often seen as a rich medium, although not as rich as face-to-face interaction, since it can facilitate visual cues and provide instant response (Denstadli et al., 2012). The newest addition to travel alternatives is *TelePresence*, and McKenzie (2008:7) describes this technology as “a form of videoconferencing that uses advanced technology to integrate the sights and sounds of remote meeting participants into a local setting, such as a corporate boardroom”. More specifically, Davis and Kelly (2008:2) explains *Telepresence* as solutions that ‘use video and audio conferencing components as well as other “arts and sciences” to create a two-way immersive communications experience that simulates an in-person, interactive encounter’.

It has been established by authors such as

Dennis and Valacich (1999); Veinott, Olson, Olson and Fu (1999); Kraut, Fussel and Siegel (2003) and Kraut, Gergle and Fussel (2002) that some media, such as email and the internet, are better able to distribute information called “conveyance” while other media such as video conferencing or *Telepresence* are better at producing a common understanding, or “convergence”. Convergence media, especially *Telepresence* technology, has the ability to “accurately simulate face-to-face contact”. It should be kept in mind that media that might be better able to handle one type of process may not automatically be as well equipped to handle the others and so the use of several types of media may be the ideal (Rhoads, 2010:115). According to Malhotra and Majchrzak (2005:11) “email and conference calls, have until recently, formed the backbone of communications support for virtual groups but these rudimentary technologies have been found to encourage miscommunication and the loss of crucial contextual information”. What is more, teams making use of email and audioconferencing often do not succeed in providing vital information regarding the underlying context of a message, for example why information has to be shared, a person's reason for not responding, the context behind decisions made or alternative perspectives on a matter (Malhotra & Majchrzak, 2005). Consequently, virtual team members relying exclusively on email and audioconferencing find it difficult to create the “common ground” needed for grasping each other's communications (Clark, 1996).

3

Factors influencing the use of technology as a substitute for business meetings

The factors that influence the use of technology as a substitute for business meetings can be seen from the perspective of the advantages inherent in their use, the disadvantages of using ICTs as alternatives and the constraints on their adoption. A number of studies agree that the most important reason for the increase in the use of audio/video conferencing tools is that it is a

way to reduce travel expenses (Arnfolk & Kogg, 2003; Business: Being there; Virtual meetings, 2004; The Conference Board of Canada & Association of Corporate Travel Executives, 2007) which come in the form of direct cost savings such as flights, hotels, car services and food as well as indirect cost savings, for example the cost of saved employee time (Meyer, 2009). It is estimated that video conferencing systems could save a company approximately 50 per cent of their original travel cost in the second year of implementation, and 38 per cent of their original travel cost during a five year period (Brightcom, n.d.). The time saving factor appeals to many business travellers since technology could be utilised as an alternative to gain lost travel time while enhancing productivity and business performance, as well as the quality of business level decision-making (Brightcom, n.d.; EyeforTravel, 2002; *Is your journey really necessary?*, 2006).

Other research showed that converting in-person meetings to meetings conducted via technology would permit business travellers to travel less, spend more time with family and friends and cultivate better relationships with co-workers, customers and partners (Wainhouse Research, 2004). Meyer (2009) asserts that one of the most essential benefits of video-conferencing is its ability to enhance employees' quality of life. He mentions that the use of videoconferences could lead to higher job satisfaction and loyalty to employers as well as less stress and improved work-family balance. Another advantage of using technology instead of face-to-face meetings is that it allows the attendees of a meeting to archive sessions and view them again later on. Organisations' concerns about saving costs may be encouraging them to implement green alternatives to business travel. Web conferencing has been gaining in popularity over the past year, and is named as one of the main sustainable business strategies (Sustainable Life Media, 2009). Video-conferencing can help lessen an organisation's carbon footprint (Arnfolk & Kogg, 2003) since organisations are beginning to give consideration to the carbon-based effect of their policies, and are reducing air travel as a way to deal with climate change (MacKenzie, 2008), while at

the same time improving their corporate social responsibility (Meyer, 2009). McQuail (2000) is of the opinion that computer-mediated communication has some advantages over face-to-face communication and mentions the fact that it can balance hierarchies among participants by reducing status, as an example. Rhoads (2010:112) adds that computer-mediated communication can "increase opportunities for participation since the more vocal have fewer means to dominate the setting than they do in face-to-face encounters".

On the other hand, some of the disadvantages of travel alternatives are preventing organisations from using these technologies. Sole and Edmondson (2002:20) define situated knowledge as "knowledge embedded in the work practices of a particular organizational site." Members of geographically dispersed teams situated at different sites thus do not share situated knowledge even when their responsibilities are alike. Cramton (2001) emphasises the creation of "mutual knowledge" as a problem when geographically dispersed teams collaborate. Kraus and Fussell (in Cramton, 2001) describe mutual knowledge as knowledge that parties who communicate with each other share, while being aware of the fact that they share this knowledge, and describe three mechanisms by which mutual knowledge could be established: direct knowledge, interactional dynamics and category membership. When dispersed team members try to achieve mutual knowledge through interaction, information must be shared and receipt and understanding of information acknowledged (Cramton, 2001). Electronic mediation creates obstacles not only to the distribution of information but also acknowledgement thereof. According to Quest (in Mill & Morrison, 2006), in the UK, corporate travellers are travelling less because of technology – particularly through the use of remote access and virtual private networking (VPN) but not many travellers believe that such technology is more valuable than face-to-face meetings. First, the practical problems linked with videoconferencing have restricted its use as it has never been completely stable (*Is your journey really necessary?*, 2006). Second, De Lind van Wijngaarden, Erman, Matthews, Sharp and Sutter (2010) believe that travel

alternatives are either too costly, need dedicated equipment and infrastructure, or are too complex to implement on an individual location basis for extensive use. Less expensive options typically do not offer the wanted level of interaction or the consistent quality required for corporate communications. Thirdly, Armstrong (2007) adds that technology often adds an impersonal feeling, while De Lind van Wijngaarden et al. (2010) mention the limited level of interaction between the participants as a disadvantage of travel alternatives. Arnfalk and Kogg (2003) believe that meeting someone in person allows the individual meeting participants to build personal networks and build deeper personal relations, something that virtual meetings do not permit. Mason (2002:65) agrees by saying that 'there is no substitute to meeting people face-to-face'. According to Arnfalk and Kogg (2003), face-to-face meetings are often preferred when meetings are held with persons outside the firm, even if such meetings could have been conducted via ICTs. Physical presence can be regarded as a sign of interest and users of virtual meetings sometimes perceive these meetings as less significant, or second class meetings. Thus, using ICTs to conduct meetings could create perceptions of a client being less important. Another disadvantage of travel alternatives is that the security of information cannot be guaranteed when using these technologies.

Apart from the disadvantages of travel alternatives, certain barriers prevent organisations from implementing these technologies in their organisations. The high telecommunication costs in some countries might deter companies from implementing travel alternatives (Gabara, 2009). Since those services are usually bought on a per-minute or simultaneous user basis, access and usage is often limited to less than 20 per cent of employees in an organisation to prevent escalating subscription costs. Gillam and Oppenheim (2006) also feel that there might not be enough knowledge within an organisation to permit implementation of travel alternatives.

Table 1 summarises the advantages and disadvantages of using technology as an alternative to travelling to business meetings, and barriers to organisations investing in such

technology. Strong arguments for face-to-face meetings have been presented in the preceding section and therefore physical travel is expected to remain the most vital tool for maintaining relationships, because of the unique strengths of such face-to-face interaction. However, it is also argued that the communication method used, either ICTs or face-to-face meetings requiring physical travel, is determined by the nature of the business interaction or the purpose thereof, as well as the type of organisation making the decision.

4

Types of business interaction suited to Videoconferencing and other alternatives

Aguilera (2008) argues that the chosen communication method will depend on the nature of the knowledge to be exchanged in any interaction. She distinguishes between two types of knowledge, namely 'codified' knowledge and 'tacit' knowledge. Codified knowledge is explicit knowledge and relates to facts (know what) and to principles and laws (know why), and can usually be communicated through ICTs because of its direct nature. Tacit knowledge, in contrast, cannot be conveyed by ICTs, but rather needs face-to-face contact. It relates to competence as well as skills (know-how) along with information regarding who knows what and who knows how to do what (know-who) (Lundvall & Johnson, 1994).

The relationship between the type of interaction and the use of computer-mediated communication also depends on the number of cues that need to be transmitted simultaneously. Rhoads (2010:115) mentions the Media Richness Theory, which postulates that face-to-face contact is the richest of the communication media since participants can transmit a number of cues at the same time. In terms of richness, face-to-face contact is followed by video communication, then telephone, and the lowest on the continuum is electronic communication, for example email and computer documents. Lu and Peeta (2009) also found that the context within which a meeting is conducted has a significant influence on the communication mode selection, with meeting contexts that do not particularly

need face-to-face contact being likely to promote increased videoconferencing usage. Furthermore, they contend that meetings that necessitate face-to-face contact, such as business discussions, negotiations, marketing demonstrations, and event participation, stimulate business air travel while videoconferencing is sufficient for information exchange, management meetings, training, and consulting. Enbysk (2008) says that face-to-face meetings are warranted under the following circumstances: when meeting a new client, when introducing new people to a continuing business relationship, when concluding a sale or signing

a contract, when delivering a product demonstration, when resolving a problem or discussing confidential information, when convening with a lawyer, when asking for money from an investor and lastly when making sales or training presentations. However, there are situations where videoconferencing and other alternatives can actually be more effective, for example as a second meeting tool after the first introductory meeting (Business: Being there; Virtual meetings, 2004). The challenge is to be able to identify these situations and assign resources accordingly (Lehman & Niles, 2001).

Table 1
Factors affecting the use of technology as a substitute for business meetings

Factor	Related factors
Advantages	<ul style="list-style-type: none"> Reduce travel expenses Save time Enhance productivity Better decision-making Cultivate relationships Higher job satisfaction Enhance employees' quality of life Improve work/family balance Reduce carbon footprint Archive sessions and to view them later
Disadvantages	<ul style="list-style-type: none"> Access and use is limited Technology is not yet ready Practical problems with technology Not human contact No relationship building and establishing of contacts Technology is costly Security might be compromised No opportunity for sharing knowledge and best practice Creates perceptions of a client being less important
Barriers to implementation	<ul style="list-style-type: none"> Telecommunication costs are too high Not enough knowledge in organisation No need for it Resist change Not a worthwhile financial investment

The cultural environment within which business is conducted may determine the suitability of travel alternatives (Hall, 2009). When travelling to Asia, for example, it is generally accepted that it will not be possible to start or even continue business relationships without direct face-to-face contact. On the other hand in Australia and North America organisations believe that business can be maintained through other media once direct contact has been made. Nevertheless, Hall (2009) maintains that face-to-face interaction is regarded as essential when developing trust in business relationships. Evidence suggests

that the organisational profile may also influence the adoption of technology as an alternative to travel. Lethiais and Aguilera's (cited in Aguilera, 2008:1112) studied companies in Brittany, France and determined that there is an association between the sector or size of a company and the frequency with which business travel takes place. Miyoshi and Mason (2009) further asserted that certain industries travel more than others, and it is thus safe to assume that the bigger the volume of travel within the organisation, the greater the need for ICT alternatives might be. According to Hall (2009) smaller firms would like to

utilise travel-alternative technologies but they do not see it as a worthwhile financial investment. Arnfalk and Kogg (2003) further believe that organisational culture will have an effect on the decision to increase the use of travel alternatives or not. In essence, it seems that the types of business interaction that would be suited to the use of travel alternatives are those where the inherent problems of dispersed collaborations have been overcome.

One of the problems of dispersed collaboration already mentioned in this paper is in creating 'mutual knowledge', defined by Krauss and Fussel (in Cramton, 2001) as 'knowledge that the communicating parties share in common and know they share'. When

considering internal meetings, for example, it is obvious that the communicating parties have shared knowledge in common. In contrast, during negotiations, shared knowledge might be absent, and so travel alternatives will not be suitable. Cramton (2001) further believes that electronic mediation presents some obstacles to information sharing as well as confirmation, since computers do not usually give efficient back-channel feedback, something that is vital during the negotiation process. In summary, Table 2 summarises the types of meetings and the nature of the organisation in terms of its size, location and culture, that would be suited to the use of technology as a substitute for business trips.

Table 2
Types of business interaction and organisational profile influencing the use of technology as a substitute for business meetings

Types of business interaction	<p>Suited to the use of travel alternatives</p> <ul style="list-style-type: none"> Internal meetings Urgent meetings Status meetings Client interaction Attending a conference Collecting information before approaching a client Second-meeting tool <p>Not suited to travel alternatives</p> <ul style="list-style-type: none"> Negotiations Disciplinary and performance hearings Sharing confidential information
Organisational profile	<ul style="list-style-type: none"> Size Location of offices Local/international Organisational culture Type of industry

Using the identified factors as the theoretical foundation, this study aims to assess the importance of the advantages, disadvantages and barriers to the use of technology as an alternative to business travel, and to show the type of business interaction that is appropriate for the use of technology. The study also ascertains whether the type of organisation has an influence on the use of technology; and finally establishes the extent to which technology are currently being used to replace business travel in South Africa.

5 Methodology

A quantitative, *ex post facto* study was conducted using a web-based questionnaire

which was designed based on the factors identified through the literature study and depicted in Tables 1 and 2. Three corporate travel managers were approached to verify the terminology used in the questionnaire and confirm the questionnaire items; in these interviews no new knowledge on the topic was generated. Furthermore, the questionnaire was then pretested amongst a group of five corporate travel managers to verify readability and correctness of the constructs and variables. Thereafter the questionnaire was distributed to the management of corporations, travel management companies and travel suppliers in South Africa derived from the 2009 register of all listed JSE (Johannesburg Stock Exchange) companies, and a number of other business and industry specific databases. This resulted in a

total of 440 organisations being approached via web-based questionnaires on a non-probability basis, with a total number of 80 useable responses being received out of the 440. Where travel management companies and travel suppliers were approached, they were asked to complete the questionnaire as a travel buyer, in other words, as a company who also has to travel for business purposes, and having the need to replace business trips with appropriate technologies.

Web-based questionnaires were chosen since these surveys are fast becoming desirable alternatives to traditional survey methods, ameliorating some of the disadvantages of self-administered questionnaires. Email and web-based data collection techniques have become popular amongst researchers because of their low costs and fast response rates (Ilieva, Baron & Healey, 2002). The anonymity that web-based surveys offer to the respondents provides a level of comfort that cannot be attained with other conventional techniques, for example, mail, telephone and mall-intercept surveys. Thus, web-based surveys are expected to represent more honest responses than other types of surveys (Rubin in Hudson & Ritchie, 2006).

Conversely, there are also a number of disadvantages linked with web-based surveys, of which the most frequently mentioned are sample frame and non-response bias (Manfreda in Fleming & Bowden, 2009). Sample frame bias refers to the non-random omission of individuals from the sample frame, due to the lasting social and spatial divide in access and utilisation of the Internet in the majority of populations, which can cause sample biases to any online research. Sample frame bias had no influence on this research study as the entire sample had access to the Internet at their places of employment. Non-response bias occurs when respondents within the sample frame have very dissimilar attitudes or demographic characteristics to those who do not respond. The purposive nature of the sampling in selecting 'typical' respondents should limit this type of non-response bias. Non-response bias increases when potential respondents display different levels of technical ability, and it becomes a particular predicament when response rates are low

(Fleming & Bowden, 2009).

It was assumed that management-level players within the corporate travel industry responding to the web-based questionnaire would have a certain degree of technical ability that would enable them to complete the questionnaire, and this prevented non-response bias from influencing the study. A further possible disadvantage of web-based surveying is the fact that the researcher often has no way of knowing if there are a number of respondents at one computer address, or if one respondent is completing a questionnaire from a selection of computers (Marta-Pedroso, Freitas & Domingos, 2007). In our study, the use of cookies and server log files addressed these concerns.

6

Data analysis and results

6.1 Descriptive statistics

First the descriptive analyses findings are provided to illustrate the extent to which technology is currently being used to replace travel, as well as how different factors affect the use of technology as travel alternatives. The organisational profile in terms of ownership, type of company and travel expenditure is shown in Table 3. Table 3 shows that the majority of respondents were employed by companies that were mainly South African owned. Approximately half of the companies were private and half public (listed on the stock exchange). As shown in Table 3 travel expenditure ranged between less than R10 million to more than R50 million per annum.

In answer to the question on their propensity to use technology as an alternative to business travel, seventy two percent of respondents affirmed that they are currently using technology to replace a portion of their travel, with tele- and videoconferencing being the most popular applications to use. In terms of the percentage of company trips being replaced by technology almost eighty percent (77 per cent) of respondents said that 5-10 per cent of their travel is being replaced by technology, while 13 per cent said between eleven and twenty percent of their travel is

being replaced. Only eight percent of respondents said that more than 50 per cent of their business trips are being replaced by technology. Table 4 indicates the results on the advantages and disadvantages associated with a company's use of travel alternatives to replace business trips, the barriers to implementing travel alternatives, and the types of meetings that are most suited to using travel alternatives. The question regarding the advantages of travel alternatives asked respondents to rate how important they think the listed advantages of travel alternatives were on a scale of 1-4 where 1 was very important and 4 was unimportant. Categories were combined, for example, 'strongly disagree' and 'disagree' were combined to form 'disagree' and the arithmetic means were calculated to rank the items. It should be highlighted that while the mean scores cannot strictly be used as a ranking tool under these circumstances of discrete data, the mode and median scores do support this. From the mean scores it was evident that the advantages that were the most important were that travel alternatives lead to more efficient use of

employees' working hours, it improved an employee's productivity and it reduced an organisation's travel expenditure. The question on disadvantages asked respondents to rate the extent to which they agreed/disagreed with the listed disadvantages of travel alternatives. The disadvantages that were ranked the highest were that travel alternatives made it difficult to build relationships, they did not allow for human contact and that one could pick up on body language when using travel alternatives to conduct a meeting. When asked about the barriers to the implementation of travel alternatives, respondents ranked the following factors as the biggest barriers: organisations might resist change, practical problems experienced with equipment and incompatible equipment. Regarding the types of interaction most suited to the use of travel alternatives, respondents felt that internal, urgent and status meetings were the most suited for travel alternatives, whereas in the cases where first contact needed to be established, new contracts negotiated and disciplinary hearings held, travel alternatives were least suited.

Table 3
Organisational profile

Ownership of organisation	Type of company	Average total expenditure	Number of respondents
Mainly South African 52 (75.36%)	Public company 24 (34.78%)	Less than R10mil	8 (11.6%)
		Between R10mil and R50mil	8 (11.6%)
		More than R50mil	8 (11.6%)
	Private company 21 (30.43%)	Less than R10mil	14 (20.29%)
		Between R10mil and R50mil	5 (7.25%)
		More than R50mil	2 (2.9%)
	Parastatal 5 (7.25%)	Between R10mil and R50mil	1 (1.45%)
		More than R50mil	4 (5.8%)
	Government organisation 2 (2.9%)	Between R10mil and R50mil	1 (1.45%)
More than R50mil		1 (1.45%)	
Mainly international 17 (24.64%)	Public company 5 (7.25%)	Between R10mil and R50mil	2 (2.9%)
		More than R50mil	3 (4.35%)
	Private company 12 (17.39%)	Less than R10mil	9 (13.04%)
		Between R10mil and R50mil	1 (1.45%)
		More than R50mil	2 (2.9%)

When asked whether travel alternatives offered an adequate substitute for face-to-face meetings, the majority (71 per cent) of respondents said that in many cases they did, 15 per cent said no, while only 6 per cent gave a definitive yes, the rest (8 per cent) were

unsure. Despite the fact that the majority of respondents agreed that travel alternatives did offer an adequate substitute for face-to-face travel to some extent, 72 per cent of respondents still admitted that their travel policy did not outline choices between travel

and technology alternatives, while 85 per cent said their organisations did not have a process to decide when to travel and when to use alternatives.

Table 4
Factors affecting the use of travel alternatives

	Rank	Mean	Median	Mode
Advantages				
More efficient use of employee's working hours	1	1.37	1	1
Improving an employee's productivity	2	1.39	1	1
Reducing an organisation's travel expenditure	2	1.42	1	1
Making faster decisions	3	1.51	1	1
Making better decisions	4	1.52	1	1
Reducing an organisation's carbon footprint	5	1.63	2	1
Avoiding the safety-related hazard of travelling	6	1.93	2	2
Allowing an employee more free time	7	2.16	2	2
Disadvantages				
Difficult to build relationships	1	1.76	2	2
Cannot pick up on body language	2	1.91	2	2
No human contact	3	1.81	2	1
Security of information might be compromised	4	2.27	2	2
Creating a perception of a client being less important	4	2.34	2	2
It is too expensive	5	2.60	3	3
Barriers				
Organisations might resist change	1	2	2	2
Practical problems experienced with equipment	2	2.12	2	2
Incompatible equipment	3	2.27	2	2
The capital layout is too expensive	3	2.25	2	2
Not enough knowledge to implement	4	2.35	2	2
Telecommunication costs in SA are too high	5	2.27	2	2
There is no need for it	6	2.97	3	3
Types of interaction				
<i>Internal interaction</i>				
Status meetings	3	1.92	2	2
Internal meetings	1	1.74	2	1
Urgent meetings	2	1.85	2	2
Disciplinary hearings	11	3.24	3	3
Solve problems	5	2.3	2	2
To share confidential information	8	2.75	3	3
<i>New interaction</i>				
To collect information before approaching a client	4	1.96	2	2
Establish first contact	9	2.91	3	2
<i>Established interaction</i>				
Negotiating new contracts	10	3.11	3	3
Sales calls	7	2.71	3	3
Attending a conference	6	2.52	2	2

6.2 Multiway tables

A number of variables were cross-tabulated to determine the relationships between travel alternatives usage (yes or no) and determinants

affecting their use. Chi-squared tests were used to assess whether any significant interaction between usage and the determinants was present. A number of relationships, presented

below, were found to be significant. One of the questions in the survey asked respondents whether they are currently using technology to replace any portion of their companies' travel. The results of this question were cross tabulated with the results of a number of other questions. Only those tests that proved significant, with $p < 0.01$ providing convincing evidence, $p < 0.05$ providing strong evidence, and $p < 0.10$ providing moderate evidence of significance are shown in the figures below.

Where cells had low counts, categories were combined: for example, 'strongly disagree' and 'disagree' were combined to form 'disagree'. Figure 1 indicates that the greater the respondent perceived the risk that ICTs might compromise the security of information, the less likely his/her organisation was to make use of ICTs. The chi-squared test provided convincing evidence of significance, with $p < 0.013$.

Figure 1

Usage of ICTs vs. security of information

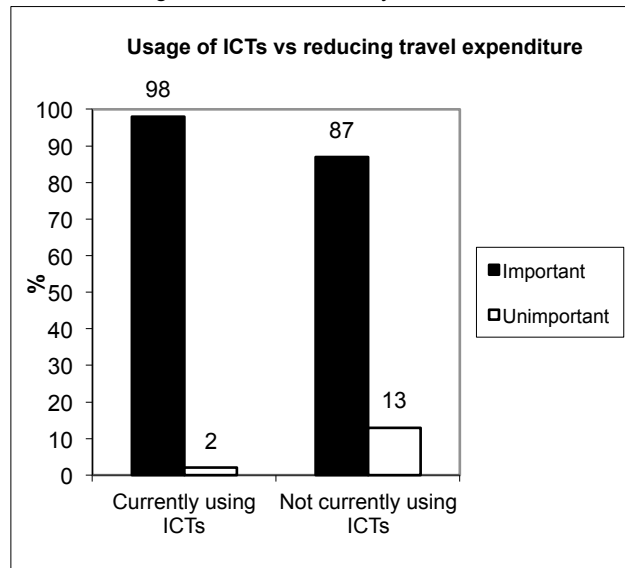
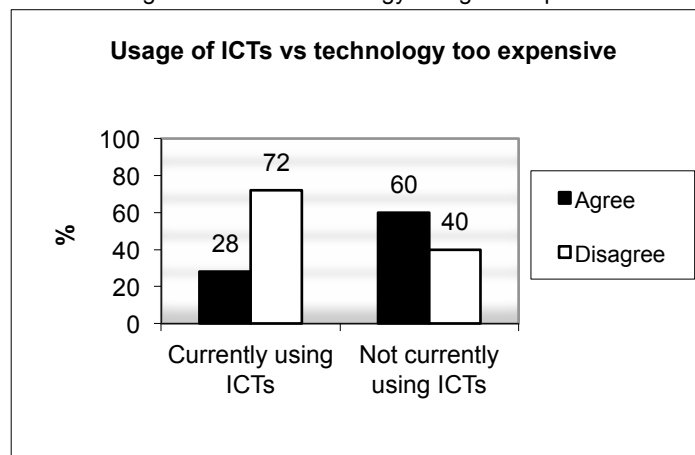


Figure 2

Usage of ICTs vs technology being too expensive

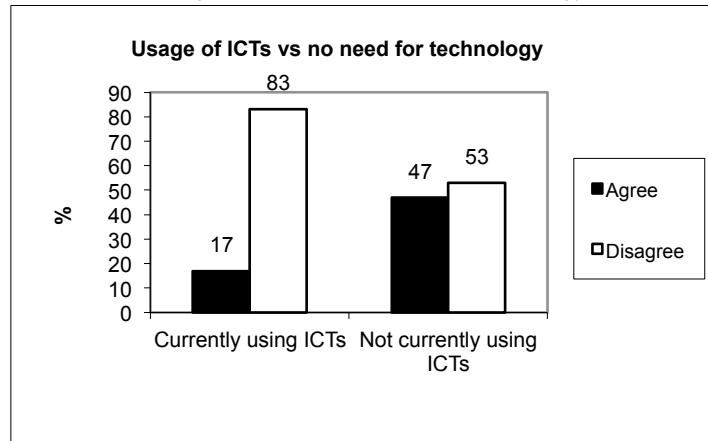


From Figure 2 it is evident that when a respondent disagreed with the statement that ICT technologies were too expensive, his/her organisation was likely to make use of these technologies. Similarly, when a respondent

agreed that ICT technologies were too expensive, his/her organisation was less likely to make use of these technologies. This relationship provided convincing evidence of significance, with $p < 0.026$.

Figure 3

Usage of ICTs vs no need for technology

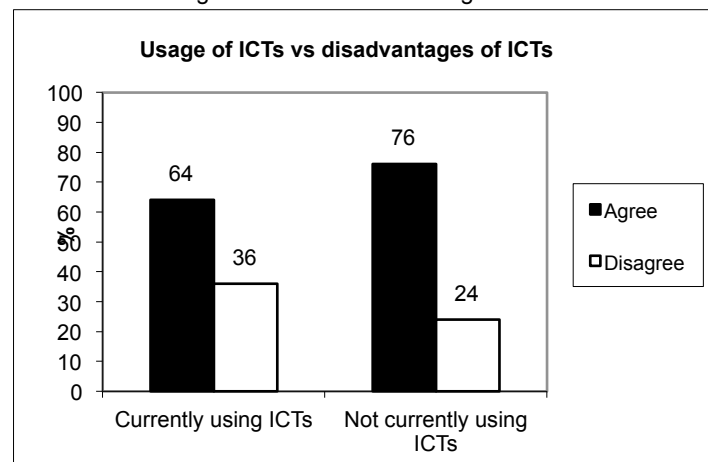


Not surprisingly, Figure 3 shows that when a respondent agreed that there was no need for ICT technologies in their organisation, the organisation was not likely to make use of these technologies. The chi-squared test once again provided convincing evidence of significance, with $p < 0.027$. Next, all the disadvantages associated with ICT technologies

were grouped together and a chi-squared test was used to establish whether a significant relationship existed between the disadvantages associated with ICTs and the usage of ICTs. The results in Figure 4 showed that the greater the perceived disadvantages of travel alternatives, the lower the usage of travel alternatives will be ($p < 0.027$).

Figure 4

Usage of ICTs vs disadvantages of ICTs



All the barriers to the implementation of travel alternatives were also grouped together to ascertain whether a significant relationship existed between these barriers and travel alternatives usage. From Figure 5 it is evident that the greater the perceived barriers to the implementation of travel alternatives are, the

lower the usage of travel alternatives will be ($p < 0.001$). From the results of the chi-squared tests, we can ascertain that the disadvantages and barriers to using travel alternatives are the greatest influencers in the decision to use travel alternatives or not.

Figure 5
Usage of ICTs vs barriers to implementation

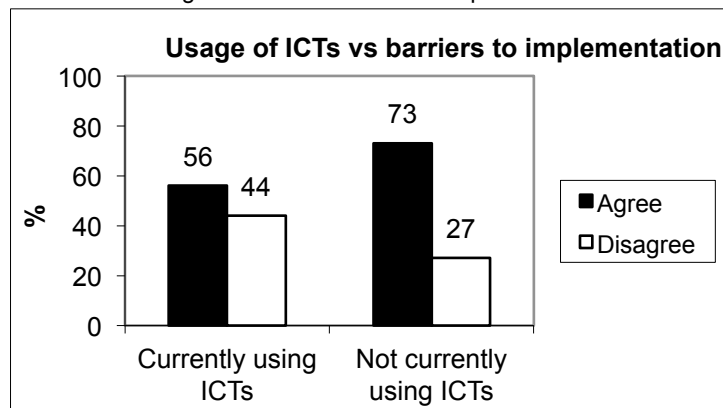


Table 5 provides an indication of the current usage of ICTs across the company profiles.

Table 5
The effect of the organisational profile on the use of ICTs

Ownership of organisation	Type of company	Average total expenditure	Number of respondents	Currently using ICTs to replace a portion of company travel		
				Yes	No	Not sure
Mainly South African 52 (75.36%)	Public company 24 (34.78%)	Less than R10mil	8 (11.6%)	4	3	1
		Between R10mil and R50mil	8 (11.6%)	5	3	.
		More than R50mil	8 (11.6%)	7	1	.
	Private company 21 (30.43%)	Less than R10mil	14 (20.29%)	9	4	1
		Between R10mil and R50mil	5 (7.25%)	4	.	1
		More than R50mil	2 (2.9%)	1	1	.
	Parastatal 5 (7.25%)	Between R10mil and R50mil	1 (1.45%)	1	.	.
		More than R50mil	4 (5.8%)	3	1	.
Government organisation 2 (2.9%)	Between R10mil and R50mil	1 (1.45%)	1	.	.	
	More than R50mil	1 (1.45%)	1	.	.	
Mainly international 17 (24.64%)	Public company 5 (7.25%)	Between R10mil and R50mil	2 (2.9%)	2	.	.
		More than R50mil	3 (4.35%)	2	1	.
	Private company 12 (17.39%)	Less than R10mil	9 (13.04%)	8	1	.
		Between R10mil and R50mil	1 (1.45%)	.	1	.
		More than R50mil	2 (2.9%)	1	1	.
				49 (71.01%)	17 (24.64%)	3 (4.35%)

In order to investigate the effect of the organisational profile on the use of ICTs, a logistic regression model was used, with ICT use as the dependent variable; the independent variables were these factors: ownership of company, type of company, expenditure (all as shown in Table 5); industry (mining, financial, manufacturing, telecommunication, information technology or engineering), the number of branches the company has, and the number of employees the company has. None of these factors were significant, with a smallest p-value of 0.311, indicating the usage of ICTs is unaffected by a company's organisational profile. A logistic regression was also fitted with usage of ICTs as the dependent variable for the factors given in Table 4. Among the disadvantages of ICT use, only three factors were significant: the security of information possibly being compromised (p-value of 0.05), difficulty in building relationships (p-value of 0.073), and ICTs being too expensive (p-value of 0.01). The final model is given as $y = 2.259 - 1.711x_1 + 1.732x_2 + 2.016x_3$, where x_1 is the response for security of information being compromised, x_2 is the response for the difficulty in building relationships, and x_3 is the response for ICTs being too expensive. This is an interesting result as it indicates that the disadvantages have a more profound effect than the advantages on whether an organisation will implement ICTs.

7

Discussion

The latest research reports predict that Telepresence and videoconferencing sales will reach \$2.7B by 2015 (Brightcom, 2010a), gaining further impetus through the 2010 eruptions of Iceland's volcano. During this time 17,000 flights were disrupted and millions of people stranded by the volcanic ash cloud covering most of Northern Europe. The value of Telepresence and videoconferencing was proven as a backup plan for businesses with delayed communication and productivity (Brightcom, 2010a). Business meetings can be conducted on a person-to-person basis or via certain technologies such as tele-, web- and videoconferencing. Person-to-person meetings require physical travel to the meeting site

while technology allows for meetings to be conducted virtually. The decision on which method to use for meetings is driven by two types of factors, personal or business. Personal factors generally relate to the factors that influence the individual traveller to either conduct a meeting in-person or virtually, such as the desire of a business traveller to discover new cultures or to meet new people, or the need of a traveller not to be away from home too often. These factors do not form part of this study.

Business driven factors can be divided into a number of categories on which management base their decisions, including the type of meeting, the advantages and disadvantages associated with the usage of technology alternatives, barriers that might prevent the successful implementation of the technologies and the organisational profile of the company wanting to invest in technology alternatives. In 2004, Lian and Denstadli's survey found that the business sector's use of videoconferencing technologies was rather undeveloped, with only a limited number of users and for a restricted variety of purposes. The use of video and other communication technologies to replace business trips has definitely increased, even in South Africa, with this survey indicating that the majority of respondents are currently using ICTs to replace a portion of their organisations' business trips, with tele- and videoconferencing the most popular applications to use. This study substantiates the findings of Denstadli (2004) who reported the "time saving" factor as the leading motive for implementing videoconferencing equipment with nearly all their respondents, indicating that they were concerned with efficiency gains to be made from videoconferencing. In the current study the most appealing advantages of travel alternatives were found to be that the use of travel alternatives instead of travel afforded employees more efficient use of their working hours, it improved their productivity, and it reduced an organisations' travel expenditure. Although organisations implement Telepresence and videoconferencing technologies at first to overcome the geographical distance between their facilities and employees, they soon realise that by integrating these technologies into their daily operations they could also use them in

product development, sales training and even as customer profit centres, enabling the organisation to achieve a larger return on investment and a larger potential for this technology (Brightcom, 2010b).

In 2004 Lian and Denstadli predicted that intra-company travel would be the travel segment most likely to be substituted by telecommunication alternatives. This was confirmed with our results showing internal meetings to be best suited to the use of travel alternatives. Charlot and Duranton (2006) are of the opinion that the improvement in ICT applications can mean that face-to-face interaction will be required for only the most complex interactions. Their point of view gained support with the results of this research showing that where first contact needed to be established, new contracts negotiated and disciplinary hearings held, travel alternatives appeared to be the least suited. The results also showed that the disadvantages of using travel alternatives and the barriers to the implementation of travel alternatives significantly influence whether travel alternatives will actually be used to replace a portion of a company's travel. This research study confirms Arnfalk and Kogg's findings (2003) in that different methods of communication can be seen to be complementary and not substitutes for one another.

The fact that most businesses still consider technology alternatives only as a supplement to personal meetings (Lian & Denstadli, 2004) has not changed, with respondents still arguing that ICT alternatives do offer an adequate substitute for face-to-face travel, in many cases but not all. Denstadli (2004) also asserted that personal relationships are complicated to create over a distance, and even though new technologies can produce 'virtual rooms' that give participants a feeling of co-presence, videoconferencing rarely substitutes the real reason for personal meetings: the in-person contact. A number of researchers (Urry, 2007; Mok, Carrasco & Wellman, 2009; Rettie, 2010) have highlighted the value of relationships and individual social networks in increasing the need for business travel. In their research Denstadli et al. (2012:70) confirmed a number of prior studies on social capital development that emphasized the importance of personal

relationships (Adler & Kwon, 2002; Cohen & Prusak, 2001; Lin, 2001; Nahapiet & Sumantra, 1998). Denstadli et al. (2012:70) concluded that "the use of VC will be moderated by a growing need for modern professionals to build personal relationships and networks with other professionals in their field".

Even though the environmental debate and other greening issues are gaining increasing importance on a global scale, it seems that these matters are not yet of great importance in South Africa. The ability of technology applications to reduce an organisation's carbon footprint was not seen as an important advantage of the applications. Brightcom (2010c) asserts that the environment not only benefits from a reduction in carbon emissions from business travel but also from the amount of paper, cardboard and other business materials that are being saved by the use of videoconferencing systems. This might indeed put South African companies at a disadvantage globally as the Aberdeen Group (2011) reports that being seen as a green company holds various branding and differentiation benefits. Companies investing in videoconferencing solutions usually focus on the need to decrease travel as an important business pressure. This has however changed over the past years, as the Aberdeen Group (2011) reports that organisations are increasingly using videoconferencing to support real-time collaboration among geographically dispersed employees. In their research 55 per cent of organisations indicated this as a core pressure motivating the need for videoconferencing technologies while only 41 per cent stated the need to decrease travel costs. Even though travel expenses will always be part of the Return on Investment for videoconferencing solutions, corporate users have progressed to the value-added advantages related to videoconferencing (Aberdeen Group, 2011).

A question that many organisations are asking is how to increase the adoption of videoconferencing in their organisations. Although this paper did not investigate this matter, industry publications suggest the following: the Aberdeen Group (2011) encourages organisations to appoint an executive champion for video collaboration. This champion should

assist in their organisation's ability to reduce travel, increase revenue and achieve greater return on investment. Furthermore, the champion should provide vision on the need for videoconferencing applications in their organisation, serve as an example of curtailed travel and increased collaboration through the personal use of videoconferencing and support best practices to enforce policies and foster dialogue throughout the organisation. Denstadli et al. (2012:69) are of the opinion that media choice is influenced more by social norms and customs than by what is being communicated and the bandwidth of the technology. They use the social influence model (Fulk, Schmitz, & Steinfield, 1990) to substantiate their view, and this model suggests that an organisation's media choice is not only dependant on the media features, but also on a person's previous experiences with the media as well as the influence of others. Denstadli et al. (2012) conclude that the use of videoconferencing is strongly influenced by the users' norms and attitudes rather than its technical abilities.

A further strategy of organisations to increase their usage of videoconferencing technologies is to increase employees' access to the technologies (Aberdeen Group, 2011). Like all studies, this paper is not without limitations. Perhaps the biggest limitation relates to the use of a non-probability sampling method. This means that the results of this study only apply to the selected respondents,

and cannot be generalised to the broader corporate travel industry population. Secondly, the number of responses added another limitation as it allowed for only a limited range of analyses to be done. Should more responses have been attained, other results may have proven significant. The results of the study are also limited to the responses received in South Africa. As mentioned earlier, the decision on which method to use for meetings is driven by two types of factors, personal or business.

This study investigated the business factors influencing the method to use for meetings, but a future study could focus on identifying the personal factors that have an effect on the use of technology alternatives. Seeing that the results showed that the biggest barrier to the implementation of travel alternatives is the fact that organisations might resist change, future research could perhaps investigate the attitudes of business travellers towards travel alternatives. In conclusion it seems fair to say that South Africa is indeed following the rest of the world in terms of technology usage to replace business trips, and the factors that set South Africa apart from other technology using countries are not causing them to lag behind in terms of technology adoption. 'Thus, rather than one replacing the other, the two modes of meetings will probably coexist within and across today's postbureaucratic organisations and serve different communication purposes' (Denstadli, Julsrud & Hjorthol, 2012:68).

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