Identifying and Implementing improved video conferencing practices at the University of Cambridge

This document has been prepared as part of an IARU Sustainability Fellowship between the Universities of Copenhagen and Cambridge, the aim of this document is to improve the knowledge base for VC facilities at the University of Cambridge, as well as carry-out qualitative data collection on how people at the university will use these facilities. This involved carrying out interviews, surveys and contacting individual departments.

1. What is Video Conferencing?

Video conferencing can be described as a method of communicating between two or more locations, where sound and vision are transmitted and received, enabling simultaneous interactive communication (Down, 2009). This technology has a special past within the University of Cambridge, as this is where the first ever internet webcam was pioneered in 1991. A technology which led onto the development of modern video conferencing (“Trojan Room coffee pot,” 2014).

This technology was originally set-up to be used by multi-national companies to link offices across the world. As the technology has improved and its use has increased the costs associated with installing video conferencing systems have fallen, this is due to competition between different companies driving down prices and encouraging innovation. This has allowed VC to spread across many other relevant sectors such as education and governmental institutions. Although VC started off as a means for businesses to communicate, as this sector started placing greater focus onto the use of VC for economic benefits VC has been adopted by 75% of organisations of various sizes and many levels in industry. These companies adopting VC have seen an average of 20% reductions in travel and through these savings are able to justify further investment into facilities to further increase their VC potential (Weinstein & Nilssen, 2013).

Although video conferencing can seem to be a relatively new technology in places such as schools, there has been a large amount of exposure to its use within modern media. For example, in news coverage presenters frequently carry out interviews using a high quality sound and picture. The value of installing VC within a university depends on a theory known as Metcalfe’s Law where the value of a telecommunications system is proportional to the square of the number of users connected to the system, in other words for communication to be effective there must be a high usage (“Metcalfe’s law,” 2014).

There are a number of reasons for why VC has grown in popularity since its creation, technology and equipment in general has progressed at such a fast rate it has now become available on a much wider scale at a reasonable cost. Where past high quality video connections would have required a dedicated connection between the sites such as satellite link ups, this can now be done via normal internet channels through dial up connections. And this technology has become free open source software on many modern handheld devices with applications such as Skype, which give a lower quality experience but can give the same benefits to the user. This was shown in a large survey carried out on VC users, which showed that a number of devices are used beyond the traditional settings such as inside rooms or at computers (Weinstein & Nilssen, 2013).
2. Why organisations decide to Videoconference

Although VC has originally been utilised by corporations as a means to increase efficiency, many organisations have included it as a means to promote sustainability as well as meet economic targets. The reduction in travel costs is ideally achieved by the person or organisation through being able to identify the types of meeting which are able to be replaced by video conferencing which can range from an international conference with many delegates travelling between university campuses for one-on-one meetings. A survey carried out by polycom (leading video conferencing business) showed that the main uses in universities are for ‘teaching home-based students and access to subject matter experts’ (Polycom, n.d.).

Economic savings through travel reductions can provide a useful incentive when using tools, which calculate the return on investment (ROI) which installation of VC systems can have through directly reducing travel expenses but also increasing the productivity of staff as less time is spent travelling. ROI calculators can be used on a range of scales, showing the personal economic gains, these calculators can be used to show the benefits of video conferencing overtime for a whole organisation, and will generally show a trend where the more meetings that take place the more higher return on investment that these facilities will have (Conferencing Advisors, INC, 2014). These benefits in time saving also reflect into personal life of employees as less time is spent travelling and therefore away from home. Considering that a leading survey has shown that 52% of university tutors think that the main reason for the lack of video conferencing is cost, then there is potential in advertising this aspect (Polycom, n.d.). There has been evidence to show however, that this is not the main driver for using VC, as the ability to increase productivity was seen as much more important, more benefits come from the softer side of increased decision making and business agility (Weinstein & Nilssen, 2013).

It is therefore, most useful to use VC in what could be termed mundane meetings where occur frequently and the benefits of face-to-face interaction may not be as useful. The ROI of these can be calculated using a simple set of factors for, the time saved not in transit (positive), desirable business trips (negative), extra time outside of work (positive) and being able to build face-to-face relationships (positive) (Conferencing Advisors, INC, 2014).

Another benefit to universities is found within the scope of potential students, as interviewing potential candidates would have previously required costly flights meaning which may have not been possible for some students. VC allows for anyone with an internet connection and computer to have the same possibilities. Going back to the sustainability which VC embeds, this can allow opportunities to mitigate their energy use through reducing the need to travel, especially within the sector of scope 3 emissions (Polycom, 2013). It can be important to remember that although these reasons can be beneficial to universities, VC may often be used out of necessity as it in line with the modern world.

Personal values towards VC can have personal preferences which can alter their opinion towards VC which develop over time. A sustained rejection of Video Conferencing could apparently be held within some people who have had a bad first experience with VC; this could have been through trying to use Skype or a similar facility with very little instruction leading to technical problems, this may have also have happened many years ago when the technology and connections were nowhere near as secure or high quality. These experiences can apparently stay
within users for many years, making them often the most difficult to change (Rogers & Hopkins, 2014).

3. Instigating Institutional VC

A number of steps need to be taken before VC is used to its fullest extent within an organisation. This firstly requires that there is a demand for the service, or a realisation within the organisation that video conferencing can benefit it’s employees/ customers. From here the necessary funds are acquired to install the facilities. This can occasionally be a challenge for small organisations or research groups; an example of this is the Isaac Newton Institute for Mathematical Sciences which has a VC suite, which was made possible through a grant given from the Royal Commission for the Exhibition of 1851 (Isaac Newton Institute, n.d.).

After this has been done a suitable room needs to locate and the equipment must be installed in a professional manner to avoid future difficulties. From there it is a case of installing the infrastructure and a network which links all necessary devices across the university together. The installing of software can often include a number of other features separate to video conferencing such as presentation of a PowerPoint presentation, data sharing, or connecting to a DVD showing.

This does not however, take in any factors relating to the adoption of VC within the university, as the infrastructure can be created but if the staff and students see no reason to use it then it will be obsolete. Here there will be a number of reasons for this and often will not be a rejection of the technology but either a lack of exposure and promotion of VC or that the types of work carried out do not require VC, these are just some of the reasons.

Polycom created a guide which includes steps to increasing VC utilisation, the first being to create VC champions within each department, or potentially in the case of Cambridge each College. These people can add credibility and set examples for other staff members, this use of ‘champions’ has been used in other areas especially within sustainability with Green champions being part of the Green Impact programme which runs in many UK institutions (green impact, n.d.). These people tackle practical issues and also challenge bad practice and is known to be an effective way of top-down approaches to an issue, and engaging staff on the topic. It can also simply work in a way where people require VC and as a result will take it on themselves to use guides and educate themselves, such as the ones provided through VC sections on other university websites as will be seen later.

Another step is a checking of the network systems, as this is often what can put professionals off VC with technical failures. So checking the performance can create more confidence within VC and a better experience all round. This principle applies to more than just the connection, it can also refer to the scheduling system and how much the system works through intuition. These can often be most effective when they are combined with the systems already in place for connecting people, such as with WebEx being easily integrated within Microsoft Office software and contacts already in place. "Integration of a VC solution with existing IT elements – directory services,
calendar, UC platforms – and a comprehensive end user training strategy are critical to long term success and widespread usage in the organization.” (Info-Tech, 2014).

When any new service is being installed and implemented within a university, one of the most challenging parts of this can be communicating this new service with the wider university, it is advised by Polycom that this is done in more than the normal channels such as information leaflets of emails. They advise doing events such as a grand opening, live demonstrations, events where the insecurities of people towards VC can be challenged. It can also be varied in what particular aspects are advertised, as there may be relatively little engagement with the framing it as sustainability benefits. Whereas, viewing VC from an efficiency and economic catalyst may be far more effective. This will be discussed more in later sections (Polycom, 2014). Early engagement within VC facilities can be one of the best methods to improve uptake, this will benefit IT personnel though relieving workload in training later on. It has been suggested that comprehensive end user training plans are critical to ensuring long-term usage (Info-Tech, 2014).

A transport project for the University of Oxford points out how the promotion of sustainable modes of transport need not be done by the sustainability team, but more by HR or people trusted, and are closer to people. Aiming for the finance department could be another way of doing this could be through financial divisions, as they will be more interested in the financial benefits which VC offers. As each department will have a financial sector, the use of VC’s financial benefits could be aimed here, though the use of Return on Investment calculators. This is because they have more responsibility to meet financial targets than the users of transport.

A proposed way to gather information which could bring the benefits and concept of VC to a greater range of people is through social media, such as Facebook and Twitter. However, it is often the case that University staffs do not follow the correct page or would not use social media at all for gathering this type of information (Dalgaard, 2013). However, this particular case study will be dealing with universities which can often have difficulties in communicating new services to potential users.

Within universities systems of VC are used and can be set up within infrastructure to different degrees depending on the use by the university. A system which distributes high quality VC within the UK and international campuses, this is provided as a free service to universities across the UK. This has saved the higher education sectors around £66 million annually and 10,253 tonnes of CO₂ emissions, along with this there are swathes of information encouraging uptake of services where on average 40% savings can be made on meetings (janet collaborate, 2013). Janet has many functions, one being the technology which allows for easy connections between a variety of devices, training courses, security. Where one of the most beneficial functions is Online booking management which provides users with an interface to manage contacts and conferences with little training (janet collaborate, 2013). This services has recently changed to become v-scene, however many websites still list this service under JVCS. Janet is used within the University of Cambridge and this is also available to all full time staff (Rogers & Hopkins, 2014).

4. Uses of VC within Education
VC was originally set up for meetings which it is still widely used for today, this can be used for international/ national conferences which are under 20 participants, as VC can become limited
with large numbers of people and screens. Its use is becoming more common for meetings of all other kinds, such as across the campus of a university or on a national scale as the benefits of VC can be applied at all scales.

As with most new technologies there is opposition, as VC removes face-to-face interaction and also a level of connection which may be lost through its use. This can act as a disincentive, especially within research and academia which the University of Cambridge thrives on. As many academics benefit in their careers from being present at international conferences there can be a number cases in which VC is not suitable. This was highlighted by a peer saying that it is common case that a researchers academic qualifications and therefore their income may rely on their attendance at international conferences. It may often be the case that instead of replacing face-to-face meetings altogether that VC is used as a supplement around a few meetings each year which do require travel, this is in recognition with how a risk of remoteness may occur if all meetings are carried out via VC (Rogers & Hopkins, 2014). This will be dealt with further in future sections.

Within the use of VC for university interviews may these be for international students or other reasons. It was found that there had been problems in securing the legitimacy of the interviewees responses as unless the interview was being conducted in a secure location which the university had organised previously, it was difficult to know if the interviewees responses were their own and not being queued up by someone else, as well as losses in spontaneity and subtle body language. (Rogers & Hopkins, 2014). This can be combined with data sharing for comparing CVs. This means that students who would have previously been excluded because they could not afford this travel, are now able to talk with the university through these methods.

With schools starting to use technology the use of VC in education is becoming more prominent for providing online lectures to students in other countries or vice versa, this opens up a large potential for specialist lectures to be given to students at the university. This lecture could even be given to multiple sites all over the world, making education on specialist subjects much more accessible. The benefits of VC are astoundingly positive and although it has been around for many years technically speaking, it’s place within institutions is still relatively new and requires work and also a change in peoples understanding of communication in order to fully understand how to efficiently use VC facilities.

5. Approaches of Universities
The following sections lists universities and institutions which can provide an insight into the best approaches which have been taken to instigate VC. A Welsh College named Coleg Meirion-Dwyfor has been leading the UK in terms of vc usage, using the same system as the university of Cambridge JANET the college uses 25-30% of all UK calls made with this system. The reason for this high use is due to the nature of the way in which the college runs. Firstly it is located in a remote area, and is closely intertwined with two other colleges and secondly, the college also provides Welsh language distance learning. For both of these practices to function efficiently inherently involves video conferencing. From a behavioural perspective the uptake of sustainable behaviour is embedded (Davies & Rees, n.d.). This example shows that the nature of the way education happens can be crucial in creating usage. In this case it is combined with the way the colleges are separated within the geography of the area.
This has been one of a number of vc successes in Wales, as universities receive support from the Welsh government and the Welsh Video Network. Swansea university in 2010/11 saw their six vc suites being used for 791 conferences in a year and an internal survey showed that 79% of people had used the vc suites and half of people said that vc replaced face-to-face meeting (von Rothkirch & Hall, 2011). There is a similar case for the university of Bangor where teaching of Welsh language has hugely benefited from VC and on average has saved 320 miles per person at a cost of £200 a year, creating savings of £120,000 a year. For each of these cases which resulted in an extremely high use of vc it should be noted that the service was provided for free by the institution. These examples show that support from something like the welsh video network can be crucial in the success, this may be down to creating an user friendly system across the country which is available to everyone, making it very accessible.

The approach from the University of Bedfordshire has many campuses and international partners and in an attempt to reduce its travel costs and carbon emissions invested heavily in vc infrastructure. After this was made 80% of the calls made were internal and benefited communication across the university, as well as economically providing a good return on investment. This success was attributed to the ‘user-friendly booking system’ and having portable vc devices which could be taken to users. (Wells, n.d.). The same approach was taken by the University of the West of England who created a 5 year plan with HP Technology Services Integrated Consulting and Polycom to create easy desk-to-desk communication (HP, 2012). So far it has been made clear that institutions which see a dramatic increase in VC can achieve this with significant investments into infrastructure both internally and externally. This applies to universities which may have been a relatively blank canvas in regards to VC to start of with, so there were fewer preconceptions within the staff at the institution. This may not necessarily be true for the University of Cambridge.

Of course when doing what was said previously, this can take a large level of investment and belief in the technology. The University of Warwick in 2010 installed 5 state of the art telepresence systems by Cisco. From making this investment on the best available technology as well as a realisation for portable technology they further promoted this though a number of ways, such as the VC service absorbing all of the costs centrally and furthermore, all calls were managed centrally. In addition to this a flexible approach was taken to meet user requirements along with a vc specialist for support, resulting in 40-60 calls per month (Owen, 2012).

These methods used by the previously specified universities are often related to putting a secure infrastructure in place, or providing a method of education which intrinsically requires that VC is used. There is little literature surrounding the engagement side of VC as a result. The University of Oxford has approached this topic through the creation of a ‘Business travel toolkit’ (Wigzell, 2012), which offers advice to staff planning a business trip on the most appropriate travel arrangements, for staff wanting to make time and cost savings. Advice is mainly focussed on non-travel alternatives which offers audio and VC as beneficial through stating:

a) “Convenience
b) Cost savings for travel, accommodation and staff time
c) Ability to link several sites simultaneously
d) Access to remotely located experts
e) Having a set time for the meeting encourages more control and less time wasted on non-agenda items.

From here it links to a centralised list within the Oxford administration which lists all VC facilities within the university. There are two lists, one provides a list of venues which have rooms and equipment with full IT support, open to all members of the university. The second list is for services which can be booked via the JANET VC service. Other information links to further information on the website and email. This section then goes onto describe WebEx and Skype which allows staff to have the tools to ‘seamlessly collaborate and share information’. Where with WebEx staff can share presentations and their entire desktop (Alder, 2014), whereas Skype is a more mainstream VoIP (Voice over Internet Protocol) and is known for being more user friendly, however as with all software installation snags can be had so configuration instructions are provided by the university. If any further help is required a short course is offered by the computer services for how to use Skype within the University system and more generally on VC (Rahtz, 2014). Although these user guides provide helpful information in a clear layout, they are commonly underused, or people who are looking for travel options are not engaged enough to actively go out and seek alternatives to travel.

Further non-travel initiatives being done by the University of Oxford includes a system for monitoring staff air travel, for which the facilities for doing this will be improved within each department. A system for monitoring staff air travel would make the potential of regulation or decisions about the most sustainable form of travel more likely to be integrated and moderated by the university, this approach may allow for decisions on travel to be more impartial and in line with policy. In a more commuting based approach to VC, the use of a University Flexible Working Scheme is to be introducing, allowing staff to work from home or other locations through VC. This has already been carried out at St. Andrews, done in the aim to give flexible working hours and reduce the number of journeys made by staff.

Cranfield University recognised a need for VC within the university and carried out a study on the ways this can benefit innovation and research on a global level. This firstly involved a recognition that the use of VC was vital in order to link disparate locations between industry and students, this led to acknowledgement of a technical solution. Cranfield University decided on WebEx due to its customer support and easy integration in Microsoft Office applications, providing an ‘enterprise focused solution’, this is open to use by all staff and students (CISCO, 2010).

A project manager at Cranfield University also calculated the time, cost and carbon savings from VC meetings rather than face-to-face in Italy as shown in Figure 1.
This type of calculation can potentially be integrated within travel booking systems, allowing people who travel to get instantaneous feedback on the savings which they can make. This data can be more useful for research groups and departments which are looking to boost efficiency in these respects.

6. VC management
At Harvard University VC is done through each school and through a central IT service desk, this is similar to the layout at the University of Cambridge where. This method allows for each school to have their own dedicated VC services which can work independently from the centralised Video Conferencing Services or IT services. This is done for a number of reasons, the most important being the direct accessibility (Rogers & Hopkins, 2014). Dependant on the user charges can also have influence over usage and setup across universities, for example the University of Cambridge charges for its use of centralised VC, this could potentially encourage users and departments to invest into their own facilities if they require a large amount of usage.

This is potentially what happened within the University of Cambridge as many departments used to use VCS to such an extent that they decided to get their own facilities, providing some explanation for its current usage (Rogers & Hopkins, 2014). When this is done, each department decide on the investment and quality as well as the technology which they use in VC, creating a more inconsistent system. This is where departments decide if they want to incur the charges themselves for external usage; resulting in cases where use of VC facilities is restricted to only internal staff and students (Rogers & Hopkins, 2014).

7. VC at the University of Cambridge
There is very little policy which can be seen as directly relevant to VC, especially at the University of Cambridge which has in the past made no special effort towards the facilities (Rogers & Hopkins, 2014), however there is room for it’s addition within some sections of already existing policy. VC features within the University of Cambridge Carbon Management Plan (University of Cambridge, 2010), under recent initiatives to reduce scope 3 emissions, being specified as a method to reduce Business Air travel.

Using data from the University of Cambridge Carbon Management Plan (University of Cambridge, 2010), 54% of Scope 3 emissions were from Transport (Air International Student), whereas only 2% of this comes from Transport (Air Business), with the same for Transport (Business). However, Transport (Staff Commute). All of these areas have potential to be reduced through replacing some of these trips with VC however, it would be near impossible to calculate this as a
number of variables and different reasons for travelling are included within these figures. Although there is currently no binding statement which says that there should be a strong preference towards the use of VC, it could be taken forward in any future revisions, or used by VCS if any improvements were to be made in the name of sustainability.

The Carbon Management Plan states under Recent Initiatives for Reducing Carbon Emissions – Scope 3 for Business travel Air in particular as the University Travel Insurance System being revised to include a ‘mode of travel’ question, this is important as it allows greater reporting of air travel data and therefore the carbon emissions related to this to be calculated more easily (University of Cambridge, 2010). This section can also make room for adding if people have considered non-travel as a mode of travel. As part of this same section is University Travel Expenses Policy which allow for environmental considerations to be taken into account in deciding travel for university business, this was initially intended to encourage rail travel over short-haul air travel, but could also be extended towards further sustainability efforts through the use of VC. These same parts of the Carbon Management Plan are also seen in the Workpackage Goals and Actions section where a 36 Month Goal is to encourage low emission travel which VC could be part of.

The main way services at the University of Cambridge are displayed are through the website, and this will be the first point of call for anyone searching for VC at the university, it is therefore important to make this page as user-friendly as possible. Website contents of the Video Conferencing section of the University of Cambridge are set out listing the two official VC suites of City and West Cambridge Studios. These are detailed as part of Figure 2 later on.

Although each of these headings is useful they could be ordered differently, for example placing Locations and Options more towards the top for users. Currently there is little direct connection provided between the Video Conferencing Service and any broader university policy along with few efforts to promote the service in the past, this may be the reason behind a low use of the facilities. “Successful use of VC and collaboration tools is as much about organisational issues as it is about technology” therefore, it must be embedded as part of an institutions communications strategy; further relationships can be formed with policies for travel, flexible working and sustainability.

When consulting with the VCS it was found that the advertisement for the services in the past was done through the use of talking about reducing the need for travel as this was better for advertising, other methods in the past to outreach have been through departmental newsletters and an attempt to go in the university newsletter. A number of seminars and talks have been given in the IT community; however these do not broaden the user base that much. There have also been demonstrations of the services made at conferences and similar events, which have had the same issue (Rogers & Hopkins, 2014).

Another aspect of VCS to be pushed in advertising is its incomparability in quality compared to the services of Skype; user-friendly free software such as Skype has given many people easy access to one-on-one VC. It should however, be promoted how the services provided by VCS are much different to these, providing a much higher quality to a different standard to that of Skype which can often break (Rogers & Hopkins, 2014). It may be the case though that traditional advertising
methods are not the most effective way of dealing with this, as people may not want to necessarily be ‘pushed’ into VC as for universities such as Colorado State University “it functions more so as a resource that is available, but not always used”. Natural growth is common in VC facilities, Newcastle University found a huge growth in usage where between August 2013 and July 2014, 233 videoconferences were supported despite no advertisement occurring. Moreover, their department reports to the sustainability team and University Senior Management regularly.

Current usage of the three VC suites provided by the university are currently used around 5 times a week, which is not high enough as “until they are all day, every day they are not used enough” (Rogers & Hopkins, 2014). These suites are currently the primary facilities provided to people looking to VC at the university. In order to gauge the extent to which VC is being carried out at the rest of the university a questions will be included in the survey.

There will inevitably be limitations to the amount of travelling which can be replaced through VC, especially within the University of Cambridge there will be a certain prestige associated with staff and researchers being present at a number of events such as conferences, which will often require international travel. This resistance to use within academics comes down to the recognition and respectability which can be gained through attending these international conferences, and also networking in a way which would not be able to happen through VC. A reason for further resistance could be due to technological advancements not being clear to people who may have used more primitive forms of VC in the past. Bad first impressions may have occurred when people used these forms back when connections were much more unreliable and lower in quality, however the technology has improved since then but this impression may still remain (Rogers & Hopkins, 2014).

8. Website layout of the University of Cambridge
The first section of the website is the cost of the facilities, in bullet pointed lists the introductory page then goes onto list benefits, locations, uses and options. All other information is listed under links at the side under Studio Locations, Availability and Booking, Our Equipment, Equipment hire, web conferencing and consultancy, Code of Practice.

In this introductory page the benefits are listed in no specific order with very no help for further explanations. The wording of some of these benefits is also not the most positive and effective way of framing the topic. They are shown in Figure 2:
There is also a lot to be said about the importance and priority of some of these over others. Under the locations listing having direct link here to room bookings could be more functionally useful.

The service provides a timetable to show when bookings are occurring, however, based on the information provided by the team it may be the case that these are not properly updated as there is often very few bookings shown online. Furthermore, although users can see when the room is available there is no way to directly book the facilities; this could be useful for repeat users and also in saving staff time. There are also difficulties in the booking calendar as there is only a single booking shown for both of the VC suites; therefore there is the possibility that someone looking to book a free suite is not able too. The only way to book rooms is through email or telephone, there is room for improvement in this booking system, as it has been found that within a number of other universities bookings are automated through the centralised room booking service, on top of this booking management is also online via v-scene and the services provided by Janet.

The Our equipment section can easily become intimidating to users with little experience in VC. This is because many people will approach the service with a number of people and a time and some other small services, this section should provide more to advise on how each piece of equipment functions, making it more user friendly.

A large part of this section and for the suites is the pricing of the equipment, as this will in some cases act to deter many people with an overload of technical information. This section could more easily be laid out in a table type system listing how each piece of equipment can carry out...
different functions. This section does make clear though the importance which the VCS put on consulting and providing training for each piece of equipment.

9. Website layouts of other universities
Booking a VC facility has been approached in many different ways. These systems have the opportunity to be either entirely based on webpage form, or simply an email address. This places different levels of work on the service which provides the facility and can ensue varying degrees of trust upon the user, along with adequate levels of training provided. A prime example of automated booking system is the University of Stirling; this is for staff only and runs through JVCS, now v-scene. The two VC suites are shown with a form following which includes a variety of inputs which are as follows;

a) ‘Video Conference Details
b) Contact Details
c) Other Venue(s) - Stirling
d) Other Venue(s) – External
e) Presentation Materials
f) Any other information’

(University of Stirling, n.d.)

A feature of the University of Virginia is that on their website with a title page of basic descriptions how to get started with VC, this comes along with quickstart guides and meeting tips, (University of Virginia, 2012).

A difference with websites is the amount of information which is displayed on a single page, the depth of the content displayed on this and this is also related to the layout of the website and the ease of use. For example the website page from Stanford University has clearly set-out advice including a number of features which benefit the user. For example, links to request VC are clearly shown. There are also short descriptions of the facilities with in-text links.
Figure 3. Website layout of VC services at Stanford University (Stanford University, 2014)

The layout for Figure 3 is much different to that displayed on the University of Cambridge website as there is a large quantity of information given, opposed to the bullet points. This information however, is laid out in more of a guide to the different services provided and aspects to give users specified help. This can be done in comparison to a layout such as University College London where the ability to find information is not as intuitive (ISD - University College London, 2014). This may be due to the sheer amount of information given and also the types of facility available being shown through unclear links. It may be the case however, that although there is potential for information on the website to be displayed more clearly, this may not have a huge potential to inspire change but it can in the future have potential in helping people access the service with potentially minimal inputs required.

10. Survey Design of Past and Potential Users

Engaging in sustainability can be a complex matter and often when carrying out surveys the responses suggest a biased view of what the general view may be. This is because often the people who fill out surveys are those who have a pre-existing engagement or interest, it can be assumed therefore, that these people who filled out the surveys are those who may want to be further engaged in the future with VC.

When surveying potential users at the University of Cambridge a number of factors were taken into consideration, for which a survey had to be designed around in order to gain useful information. As a result the survey gathered information on the role of the respondent within the
university, as the most likely target audiences are staff and academics. However, due to the organisation of the University of Cambridge and Universities in general, getting publicity for the survey was one of the biggest challenges. This was done through using the networks available, such as those within the Environment and Energy Coordinators Network and correspondence with VCS and Computer officers throughout the university.

As with all surveys there is the risk of having a biased sample, or only the survey out to people with a vested interest. This problem is very difficult to avoid and the way this was avoided in this survey was to use as many different networks as possible, and although the Environment and Energy Coordinators Network is formed of people with a particular interest, it is comprised of people all across the university. An incentive of a £25 Amazon gift voucher was offered as part of a draw, this was done to hopefully encourage people to carry out the survey.

Questions in the survey were designed to gather information on the individuals’ exposure at the University of Cambridge and their experiences with it, including how they book, use and for what purpose, as well as a variety of other questions on how they would like VC at the University to be. Special care was taken when designing the survey on the ordering, flow, length and specificity, especially in regards to multiple choice questions. The completed survey can be seen in Appendices 1.

The survey of past users was of a similar structure; however the questions were more directed towards how their experiences with VC had been in the past, and what would be required to improve these. There were only a limited number of participants for this survey which were acquired from the VCS. For both surveys care was taken in ensuring that each question was placed correctly so that it flowed smoothly, and that there were areas for

11. **Results from Survey of Potential VC Users at the University of Cambridge**

The survey yielded 155 responses, from 75 departments and subsections across the university. The role within the University of 37% of respondents was as Assistant Staff, where the majority rest of the roles were from other staff types and academics/ postgraduates. Only a few responses came from students which was done purposefully, but is also due to the survey being carried out during summer when most students are not studying. Out of everyone surveyed just over half (50%) said that they do not use VC, alternatively nearly half of people said they use VC, and 49% of people did not know about the existence of VCS.

Of the people who used VC and knew of VCS, 50% of these people knew about their access to VC facilities within their department while majority of the rest said no whilst some were unsure.
Figure 3. Results from Survey of Potential VC Users at the University of Cambridge for Question 6. ‘If you have used these facilities in the past how would you rate your experience with the Video Conferencing Service?’ based on answers from 44 respondents, with 5 being excellent and 1 being poor.

Analysis of satisfaction with those who had used VCS had been done on a rating system shown in Figure 3. This shows that users had a good to very good experience with VCS. For respondents who answered no to questions 3 or 4. They were forced to skip questions 5 – 8, as they were not applicable.

Of the respondents who use VC, 63% of them knew of the facilities within their department, when asked who they book with a similar answer was given where 65% of people book the facilities through their department. All respondents who said they do not/weren’t sure about accessing VC facilities in their department booked primarily with VCS. There was however, a quarter of people who did not know how to book facilities, who could be a target market for VCS.

The survey found that a high number of people (45%) book VC within their department over VCS. This may be due to peoples greater knowledge of the facilities within their department than those of VCS, along with a number of factors such as ease of access and accessibility. However, it was found that VC technology was largely used for non-work purposes; this most likely is down to some vagueness within the questionnaire about how the use of Skype, Facetime and other user friendly forms of VC fit into the survey. Question 9 was designed to identify the different purposes for which people use VC, the results of which are shown in Figure 4.
Figure 4. Results from Survey of Potential VC Users at the University of Cambridge for Question 9. ‘For which purposes have Workplace/ Centralised VC suites or Personal devices been most effective?’

The greatest uses for both VC methods were One to one meetings with peers, and interviews with prospective students. These received a much greater number of respondents generally, a great variety of other methods were specified (Appendix 2), it may be the case that One to one meetings scored highly for both types because they offer a vague description for the more specific types of one to one meetings specified, such as may be the case with interviews or Phd Viva’s. Interestingly more people would use personalised devices for one-to-one meetings with peers for domestic calls, this is most likely due to people wanting to carry out calls internally within universities for which personal devices would be much more easily accessible.

The largest differences came with Thesis defences which were much more effective on personalised devices. Whereas, unsurprisingly workplace/centralised devices were more effective for conference participation. The results of Figure 4 show that generally more effective VC came from personalised devices.

If the University of Cambridge is to improve its services it is vital that they know for what types of travel VC would be able to replace, adding direction towards actions taken to promote VC.
The type of travel most appropriately replaced is flying both nationally and internationally, this stands out as recognition that many meetings are not necessary to be in attendance. However, low score for international conferences show that these are unlikely to be replaced. These results show no insight into if people would accept VC as a replacement for flying, or alternatively what would encourage them to make these changes.

As discussed previously there are a number of reasons to why people would decide to videoconference but it is important to know what the main infrastructural/technical problems to
why people at do not videoconference as these can be much more difficult to overcome. The largest was found to be a lack of facilities for other people at the university and the second largest being the costs associated with doing so. When looking at individual reasons for not VC it can become much more complicated, where personal preferences become involved in dealing with these.

Figure 5. Results from Survey of Potential VC Users at the University of Cambridge for Question 12. ‘What prevents you from using video conferencing?’

The largest prevention aside from ‘Other’ in Figure 5 is that individuals who people want to connect with do not have the correct technology to videoconference. The greatest number of respondents were in the other section, this is due to a large number of responses around not having the correct information to videoconference and also that there is no need for VC within the work being carried out.
Figure 6. Results from Survey of Potential VC Users at the University of Cambridge for Question 13. 'Ideally where would you like to use video conferencing?'

The most ideal place for people to use VC at the university is in their office shown in Figure 6, which allows for a large ease of access. The two other largest categories were in a dedicated suite or conference room; this is most likely when a more formal setting is required. These two places may seem like obvious choices however, it is important to have information on where users of VC would like to use it, so that needs can be recognised.

The same recognition of user needs also needs to be known with the benefits of VC which appeal to users the most, knowing this will allow information campaigns and structuring of VCS at the University of Cambridge to be directed towards catering for certain desires.
The most beneficial aspects of VC as shown in Figure 7 were reduced travel costs and reduced travel time/time spent away from the office. The majority of ‘Other’ responses were for environmental/sustainability considerations. This was not included in the survey results because a focus was being placed on the individuals’ wellbeing and working conditions, for which sustainability does not directly affect.

What appeals to the respondents most when deciding whether to use VC is the reduced travel costs and the reduced travel costs, shown in Figure 7.
A significant part of this project is aimed towards encouraging the use of VC, as part of VCS and generally across the University. In order to do this it is essential to know the ways in which people access information of this kind, so that the most efficient mode of communication is used as to not waste resources and time. This was found in Figure 8 to mainly be through Departmental emails and the Website.

12. Results from Survey of Past VC Users at the University of Cambridge
This survey was carried out primarily on past users of Video Conferencing Services provided at the University of Cambridge, this survey was carried out to gauge how satisfied users of this service were in order to gain an understanding of positive areas or the service and the areas requiring attention. This survey was carried out on only 4 people due to the limits in the amount of data available for past users. Although a relatively small sample was taken, it is still possible to gather some potential conclusions from the responses. Which are as follows:

- VCS is mostly used for overseas meetings
- Users rate their experience with VCS very highly
- Most valuable benefits are primarily reduced time spent travelling/time spent away from the office and secondly, reduced costs associated with travel
- “the payment system is a little primitive” was stated as a hindrance to use of VC
- VCS would be used more if it were located departmentally and provided at no cost
- “I really want to see Adobe Connect pushed to the masses. The project currently is about 2-3 years old, with absolutely no communicated strategy involved.”

13. Information Gathered through Compiling VC Facilities Across the University of Cambridge
Parallel to this study information was being gathered across all university departments on the VC facilities which they have departmentally, this was also carried out on different faculties, research institutes and subdivisions depending on their size, totalling 142 different parts of the University to be contacted. This was being carried out in order to gain an understanding for the first time of what each part of the University of Cambridge was doing in regards to VC. This was done through contacting the relevant people such as Computer Officers and Receptionists from each department. From this research it was found that many departments had no facilities, and if they wanted to use some they would often install Skype and carry out a videoconference that way, often commenting on the difficulties and low quality which this ensued. This

14. Analysis of survey results
Although around 50% of people at the university said that they had used VC, there still could have potentially have been a grey area when people were responding to if they use VC, this is because some people consider Skype to be included and others don’t. Furthermore, around half also said that they knew about the existence of VC in their department. Due to other universities rarely publishing data on their usage it is difficult to gauge if this is high or low; based on the statistics shown by leading universities it is possible to say that there is still room for improvement.

Information was gathered on the differences in which people use VC in Figure 4. There was very little difference between whether people used portable or centralised facilities for most types, apart from for PhD Viva’s and defences which both saw a preference towards portable devices.
This is potentially because they are more personal. And unsurprisingly conference participation saw was preferred in conference environments. This shows otherwise that although there are a variety of uses for VC, they are not dependent on location. It was also seen within Figure 4 that a much higher proportion of people had used VC for one-on-one meetings, this is the case because the responses to the survey created a situation where many other responses will also fall under one-on-one meetings.

Although VC was originally created under the premise of being used exclusively for conferencing the results of Figure 5 show that it has gradually moved away from this towards a technology which is versatile and can be used for many different situations, many of which are not instantly obvious. A number of these are shown in Appendix 2 which lists a number of purposes for which people use VC. The benefits of this is that it shows that users of VC no longer interpret the technology as being used only for that purpose, this means that it’s use by many separate people is more likely without the need to promote this aspect so much.

Figure 6 shows how most people would want to carry out VC in their office, the relevance of this is to the services which are currently provided by the VCS which currently focus on the VC suites where almost no information is provided on their website for VC users who want to carry out meetings through their individual computer. A large number of modern laptops have AV capabilities built in and for computers which do not the equipment has become relatively cheap. A high proportion of the ‘Other’ responses in Figure 5 included statements such as “lack of reliable and convenient facilities on my devices that are compatible with technologies in other institutions” and “If the facility was available at own office equipment instead of having to move to the facilities”, there are a number of other comments which follow these trends. These comments can lead to concluding that a system is required which allows desktops not only within the University but between universities to be installed on desktop and personal computers, as well as more professional systems. This is possible through the services provided by JANET and v-scene, which provides VC connectivity across the UK. This however, is currently not connected to nearly all University of Cambridge and as was seen in other Universities, a large commitment is required to install these systems and behaviours which lead to their use, but large benefits can occur when done correctly.

In communicating with potential users of VC it is useful to know why these people have decided to use this, this is so that marketing and creation of information about the service can be tailored. The information provided in Figure 7, can be used by VCS by for example, knowing that potential users value reduced travel costs there can be a greater inclusion of this given on the homepage for VCS, along with some additional guidance and tools such as ROI calculators which show the direct savings which are made from VC. The same can be done with time savings. Using travel data from each department, it will be possible to give estimates on the time and money saved through VC if they were considering investing in VC facilities. The information in Figure 7 is also useful in structuring what pieces of information are prioritised within the website, as at present the headline is ‘saving your money and Planet Earth’ (University Information Services, 2014) which could potentially, based on survey responses be Saving you time and money.

At present very little has been done to promote VC at the University of Cambridge. And only around half of people surveyed knew about the existence of VCS, it is therefore safe to assume
that promotion or marketing will be required in the future to promote either VCS, or the creation/development of facilities departmentally. Figure 8 shows that the main method for receiving information on new services is through Departmental Newsletters and the Website. This will be useful if any major changes or advances are being made in VCS or to the structure of VC at the University of Cambridge in general, this could be for example the changing of the services provided by VCS becoming free to use, or the production of a guide to VC facilities available at the University.

It was difficult to gather direct information regarding the pricing of VC because this was not the intention of the survey, this would be appropriate if it was being used to promote or change the need for VCS to charge. There are however, some mentions to this topic within the questionnaire. However, there is no specific section. It can be interpreted from responses though that paying for services has not been the main drawback to why people do not VC even though it is tenuous to say so. This data is also problematic in the way it does not specifically focus on those who pay for the services, as it is always free departmentally this aspect would ofcourse not be appropriate.

15. Communications Material
Communications material for VC most often comes in the form of best practice guides for how to use equipment and carry out at a videoconference in a professional manner. However, the situation at the University of Cambridge only deals with these two issues to a small extent. During research it was found that a number of issues in communicating certain aspects of VC to appropriate communities around the university. The use of guides such as those seen at the University of Oxford can provide within a single guide information on all services provided, in a way which does not provide an overwhelming degree of technical information to the reader. It is however, not known how much guides like these have been used and to what effect they have had.

Over a half of survey respondents did not know of or use VC at the university. Therefore, it is safe to say that there is still work to be done in promoting Video Conferencing Services along with promoting other methods of VC which are available through a variety of other departments. The most effective way to do this based on Figure 8 would be through departmental emails or on the university website/newsletter. The most likely point at which this could be used is if large scale changes occur within VCS such as with infrastructure or if usage became free as part of the facilities provided by VCS, promotion through this method could be very beneficial. The results that show that people largely access information through the website could be used to encourage VCS to add more features to the website.

Further changes could be made structurally to the website, at present the order lists cost at the top. Although this is a factor it does not need to be at the forefront of communication in VCS. A more inviting way of doing this could be through giving a small written description of the services provided providing integrated links. For example: The University of Cambridge has three fully functioning suites run through VCS (University Information Services, 2014) and facilities across the rest of the University within departments.

Depending on what is being communicated departmental emails can provide all the necessary information to people individually, this could be a simple as linking them to a resource bank which
provides a range of information may this be within their department or as part of a centralised system.

16. Booking VC
Booking VC at Exeter it is done through the normal room booking channels of the university during which a box is checked that VC facilities are required, after this an email is sent asking for the Audio visual support required, for which information on the meeting is given. With this a guide is given to provide a small amount of information on how to most professionally carry out a videoconference. Along with this booking it also states that IT Support/ Learning Spaces Support must also be booked through a separate portal. After this happens Learning Spaces Support meet before and provide training as well as giving demonstrations (University of Exeter, n.d.).

17. Charging for VC
The University of Cambridge currently charges for its VC services at:

- £40 (ex VAT) per hour manned office-hours
- £40 (ex VAT) per hour unmanned ex-office-hours
- £112 (ex VAT) per hour manned ex-office-hours'
  (University Information Services, 2014)

It is normally up to the decision of the IT services who provide VC if they want to incur the charges themselves or pass it onto the customers. Video conferencing has a number of costs associated such as setting up and installing the system which will be the largest initial cost, after this there are costs associated with setting up secure ISDN lines and high speed connections, as well as often having IT staff for the running and training of the facility. The decision of whether to charge for the services provided has been under much discussion by the Video Conferencing Services at the University of Cambridge. As it may be the case that charging for the use of these services, especially in the way Cambridge does may be of putting to some people who were thinking of using the service more so when free options are available.

Many Universities studied have found to provide free VC services to their students and staff, however it is often the case that when out of hours or ISDN call costs occur that they will pass on these costs to the customer. This is true for Glasgow and their facilities are “available for any external organisation to videoconference ‘in’ with any member of Glasgow University staff” (University of Glasgow, 2014).

For all of the cases where VC was set up through the Welsh Video Network it in an extremely high usage and the service was provided for free by the institutions. Other universities offering free VC to staff and departments were contacted through personal communication and include the University of Binghampton (with a high variety of uses such as dissertations), Colorado State University who have no centralised facilities and everything is done departmentally (all rooms used at least twice a day), University of Glyndwr, Newcastle University (free coordination testing and technical assistance provided to users, furthermore departmental facilities aren’t particularly well used) has seen increased in use on average 30 – 35% a year since 2011, Staffordshire University (over 10 uses per week), Goldsmiths University of London (services supplied to all departments via the IT Services Department).
Making people pay for this service creates a different type of clientele, as according to VCS (Rogers & Hopkins, 2014) there are users who pay for the service but “grumble” about it, and users who won’t pay at all. Furthermore, problems occur through charging for VC because no invoices can be given by VCS, this can use large amounts of staff time and potentially cost more administratively than the money earn through charging for the service (Rogers & Hopkins, 2014).

When paying for VC there is no way of gaining financial support for doing so, there is a variety of ways to gain support to pay travel expenses such as bursaries but there is currently no similar support for people who wish to videoconference instead of travelling (Rogers & Hopkins, 2014).

As the survey was directed towards behaviours and attitudes towards VC there were no questions which directly asked if people would use VCS more if it were provided for free. And although there were mentions of this

18. Ideas to encourage use of VC
A survey carried out on travel managers and their attitudes towards VC showed ideas relating to the way in which “travel hierarchy” links to booking videoconferences. As the way booking occurs can provide different levels of thought by the user on how necessary their journey is (James & Hopkinson, 2011).

- “limit on travel budget if staff cannot prove that there was no alternative to travel (such as use of VC technology) guides for completely new users - how to book, what they can expect, advantages of VC use
- Monitoring and publicising usage of VC, and turning this into a positive success story. i.e. by using VC kg CO2e saved.” (James & Hopkinson, 2011)

As part of the website a section could be included on how to use the equipment, although the equipment may seem difficult to use for an outsider with no experience. A well-made user guide can take users through the process without the need for lengthy and costly training (University of Binghampon, 2012).

19. Workshops/ training
A method previously stated to help increase usage of VCS was to outreach into other departments and provide training and workshops, this has been given in the past to new staff and was found to be very effective (Rogers & Hopkins, 2014). As seen in the survey, one of the most common reasons for rejecting VC was due to a poor understanding of the software and equipment and having past experiences which have led to people viewing VC in general with these same failings. It was found that there was very little understanding of the reasons to why the services provided by VCS would have been higher quality than departments simply installing a skype. There are ranges of ways in which this training can be done, and it will largely depend on what systems are being set up to be used.

The use of workshops and training ties into the same tactic of education as the website will hope to achieve. As at present there is little information provided for people who wish to carry out VC. As this information is not completely available through VCS, this may have lead to so many people turning to use the services within their departments which have been seen to be mostly substandard. There are many approaches which can be taken to training, and this is dependent
on whether this is being provided to the staff who require it at the time, or if it is being given to the wider university.

20. **Infrastructural Considerations**

Using software which integrates with the university software already in place can allow different types of VC technology to be linked up; allowing VC to be used for both conferences and face to face through a number of different devices such as mobile phones. This can be done through services such as Microsoft Lync, or BlueJeans which is used by Colorado State University. This allows for simple VC connections through a web browser, through integrated solutions such as this the need for dedicated VC suites is essentially eliminated. This is not intended to make traditional VC suites obsolete, but to support the facilities so that the demands are met.

A situation may often occur where a university has specialist equipment, but users at the end are not equipped to the same level. This is part reason to why Skype has increased in popularity to such an extent, Goldsmiths University of London saw this as a much higher demand than that of VC support, along with Skypes ability to connect easily with many destinations. To increase the usage of Skype it has been installed as standard software on all centrally bookable teaching spaces; with equipment to support it. This allows for a low quality VC in every teaching space.

At no specific point during the survey was it asked if the services provided by VCS should be free to use, it was however, within parts of some questions it was asked if the cost had any impact on their usage which was found to be an insignificant factor. At the University of Cambridge, the relationship which many people who use video conferencing was through their departments which in all cases offer VC services free to staff.

21. **Conclusions**

Over the course of this project the initial scope of investigating the use of VC at the University of Cambridge turned out to be a much more complex issue than initially anticipated. The project was not so much about behaviour but about the way the infrastructure within the university at present fits in with the way in which people would like to use VC and the ways in which this is currently organised. Hopefully the information gathered in this document will be applicable for use by the University of Cambridge and other Universities who may take a direct interest in the topic.

23. **References**


janet collaborate. (2013, January 3). Janet Videoconferencing: HAVE YOU GOT IT?


Wells, J. (n.d.). Videoconferencing at the University of Bedfordshire. JISC.

24. Appendices

Survey of Potential Videoconferencing Users at the University of Cambridge

This survey is part of an IARU Sustainability fellowship within the Environment and Energy section. The project is to identify and implement improved practices relating to videoconferencing. This survey is intended to aid this research as well as provide a basis for future developments within the facilities provided by the University of Cambridge.

Completing this survey, when email address is provided enters you into a draw to win a £25 Amazon gift voucher.

Video conferencing can be described as a method of communicating between two or more locations, where sound and vision are transmitted and received, enabling simultaneous interactive communication. Through the use of technologies such as Skype, WebX or more professional systems.

For further information feel free to contact Frederick.Lowther-Harris@admin.cam.ac.uk

1. What is the name of your department?

2. What is your role within the university?
   Please select one answer
   - Undergraduate
   - Postgraduate
   - Contract Researcher
   - Assistant Staff
   - Academic
   - Other:

3. Do you use videoconferencing?

4. Do you know about the Video Conferencing Services at the University of Cambridge?
5. Do you have access to video conferencing facilities in your department?

6. If you have used these facilities in the past how would you rate your experience with the Video Conferencing Service?
With 5 being excellent and 1 being poor

   - 1
   - 2
   - 3
   - 4
   - 5

7. Do you know how to locate and book video conferencing facilities at the University of Cambridge?

8. Do you use your personal video conferencing technology and equipment for work purposes?

9. For which purposes have Workplace/ Centralised videoconferencing suites or Personal devices been most effective?

Check the appropriate boxes

<table>
<thead>
<tr>
<th>Workplace/ Centralised</th>
<th>Personalised devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview with prospective student</td>
<td></td>
</tr>
<tr>
<td>Teaching online courses</td>
<td></td>
</tr>
<tr>
<td>Phd Viva's</td>
<td></td>
</tr>
<tr>
<td>Conference participation</td>
<td></td>
</tr>
<tr>
<td>Thesis defences</td>
<td></td>
</tr>
<tr>
<td>One to one meetings with peers (Domestic)</td>
<td></td>
</tr>
<tr>
<td>One to one meetings with peers (International)</td>
<td></td>
</tr>
</tbody>
</table>

In regards to question 9, are there any other purposes for videoconferencing?
10. For which purpose is video conferencing most appropriate to replace work travel? 
Please select one or more answers
- Domestic travel by car, rail etcetera
- Across University travel
- Flying (Domestic)
- Flying (International)
- Domestic conferences
- International conferences (1-2 days)
- International conferences (3 or more days)
- Other: ________________________________

11. What would make you more likely to use video conferencing? 
Please select one or more answers
- Easier to use technically
- More facilities
- More people at other Universities had the facilities
- If the cost of video conferencing at the University was less
- Video was available on my mobile device, tablet etcetera
- Other: ________________________________

12. What prevents you from using video conferencing? 
Please select one or more answers
- No access to video conferencing services
- Difficulty scheduling and/or initiating video calls
- Difficulty using conference room equipment
- Cost of the video conferencing service at University
- Don’t see the value in video-based communication
- Dislike being on camera
- Individuals I want to connect with are not available via video-conference
- Don’t understand how to use the software/technology
- Other: ________________________________
13. Ideally where would you like to use video conferencing?  
Please select one answer  
- General conference room  
- Dedicated video conferencing room/suite  
- In an office  
- In a cubicle  
- At home  
- On the road  
- Other:  

14. What benefits of video conferencing appeal to you most?  
Please select one or more answers  
- Reduced Travel costs  
- Less stress from travel  
- Greater ability to maintain relationships with peers  
- Reduced travel time/time spent away from the office  
- Ability to work from home  
- Increased productivity/efficiency  
- Other:  

15. How do you access information about new services at the university?  
Please select one or more answers  
- University Newsletter  
- Department newsletter  
- Departmental emails  
- Noticeboards  
- Website  
- Free training sessions  
- Stalls at events  
- Social Media  
- Other:  

16. To be entered into the draw for the £25 Amazon gift voucher please enter your email address in the box below.  

Appendix 2.  
Other Section Results from Survey of Potential VC Users.
<table>
<thead>
<tr>
<th>Questions</th>
<th>Purpose/Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>In regards to question 9, are there any other purposes for VC?</td>
<td>No that I would use. My use was to contact a manufacturer so we could speak about equipment development</td>
</tr>
<tr>
<td>10. For which purpose is video conferencing most appropriate to replace work travel?</td>
<td>All of the above</td>
</tr>
<tr>
<td>11. What would make you more likely to use video conferencing?</td>
<td>availability in more locations instead of having to go pick up hired equipment or attend at the v/c suite.</td>
</tr>
<tr>
<td>Interview prospective staff</td>
<td>ALL OF THE ABOVE</td>
</tr>
<tr>
<td>no</td>
<td>I used video-conferencing to contribute a talk to a one-day colloquium in the US, held at a time when it was difficult to get away from Cambridge</td>
</tr>
<tr>
<td>Business Leader Workshops</td>
<td>International team meetings, PhD vivas</td>
</tr>
<tr>
<td>Academic staff interviews</td>
<td>International Workshops &lt;3hrs</td>
</tr>
<tr>
<td>Meetings with international scientists (not one-to-one) and funders</td>
<td>Interviews</td>
</tr>
<tr>
<td>Interviews with job applicants</td>
<td>Interviews and meetings</td>
</tr>
<tr>
<td>Meeting with project partners, interview prospective collaborators</td>
<td>meetings in UK</td>
</tr>
<tr>
<td>one to one teaching</td>
<td>mentoring</td>
</tr>
<tr>
<td>Company leadership Workshops</td>
<td>Better quality video/audio and more stable connections.</td>
</tr>
<tr>
<td>International Workshops</td>
<td>cannot comment on the facilities here as I do not know!</td>
</tr>
<tr>
<td>Confidential locations</td>
<td>Better quality of call.</td>
</tr>
<tr>
<td>Mentoring</td>
<td>Don't need to use it really</td>
</tr>
<tr>
<td>Client meetings, discussions</td>
<td>regular meetings</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>MEETING WITH PROJECT COLLEAGUES (FOR WORK)</strong></td>
<td>Several of the options above</td>
</tr>
<tr>
<td>Staff use departmental and personal equipment</td>
<td>this is a poor question - mixing purpose and mode of travel</td>
</tr>
<tr>
<td>training courses/e-seminars</td>
<td>To prevent the need for meetings elsewhere that involve any travel</td>
</tr>
<tr>
<td>committee / project meetings</td>
<td>Training events; Working group/committee meetings</td>
</tr>
<tr>
<td>occasional supervisions if supervisor or student is out of the country, interviewing job applicants (for limited jobs)</td>
<td>We teach our students via webinars and teleconferencing</td>
</tr>
<tr>
<td>Cross-institutional working group and committee meetings (domestic and international); training event</td>
<td>We use it for interviewing international job applicants</td>
</tr>
<tr>
<td>I haven't used VC</td>
<td>When you know who you are conferring with in terms of examination. I am concerned with authenticity</td>
</tr>
<tr>
<td>Activity</td>
<td>Benefit</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>No</td>
<td>more demand in the sense of 10 above</td>
</tr>
<tr>
<td>webinars and international roundtable discussions</td>
<td>More familiarity with how it works and how it could be used</td>
</tr>
<tr>
<td>Interviewing job applicants, remote attendance of meetings</td>
<td>More information or advertisement on video conferencing</td>
</tr>
<tr>
<td>Bringing together a group of alumni</td>
<td>More other (non-university) contacts had facilities</td>
</tr>
<tr>
<td>Job interviews</td>
<td>More people at the agencies we work for with facilities, and I had a room to use it in (office crammed, scruffy and sometimes shared with someone else)</td>
</tr>
<tr>
<td>EU research project consortium meetings</td>
<td>More people in other organisations willing to use video-C instead of organising meetings</td>
</tr>
<tr>
<td>staff interviews</td>
<td>More publication of these facilities I didn't even know we had them</td>
</tr>
<tr>
<td>Job Interviews</td>
<td>MORE RELIABLE (TECHNICALLY)</td>
</tr>
<tr>
<td>Recruitment</td>
<td>More reliable connections so calls don't drop</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Interview job applicants</td>
<td>More technical assistance and promotion</td>
</tr>
<tr>
<td>Contractor meetings, Product demonstrations, Professional Development</td>
<td>not appropriate</td>
</tr>
<tr>
<td>Joining meetings</td>
<td>Not really relevant to my role, so hard to answer this one</td>
</tr>
<tr>
<td>Participating in selection meeting</td>
<td>Reliable connection</td>
</tr>
<tr>
<td>Covers it</td>
<td>videoconferencing available on local PCs/webex etc</td>
</tr>
<tr>
<td>Video Conferencing is useful for disparate teams to keep in touch, seeing a face when you are in contact makes it feel more personal</td>
<td>We already use it via our desktop machines &amp; mobiles to a good degree</td>
</tr>
<tr>
<td>Project meetings</td>
<td>we use SKYPE</td>
</tr>
<tr>
<td>Teaching standard courses</td>
<td>works better on office PC</td>
</tr>
<tr>
<td>Group meetings with several participants</td>
<td></td>
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<tr>
<td>-----------------------------------------</td>
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<tr>
<td>international workshop</td>
<td></td>
</tr>
<tr>
<td>Delivery of executive education where we want to bring in international speaker or connect a speaker based here to a short programme based at a company abroad</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Basic facilities (desktop machine, webcam and Skype)</td>
<td>Any of the above</td>
<td>ability to gain more immediate results instead of spending time arranging a face to face meeting</td>
<td>ask colleagues / staff</td>
</tr>
<tr>
<td>Currently use teleconferencing for virtual meetings, which is effective and easy to set up</td>
<td>at my desk</td>
<td>Ability to hold business meetings internationally; ability to host and deliver webinars</td>
<td>generally word of mouth</td>
</tr>
<tr>
<td>Depending on situation, it is also seen as being less personal than face-to-face. However, it does open up more possibilities.</td>
<td>Depends on the circumstances</td>
<td>Better for the Planet</td>
<td></td>
</tr>
<tr>
<td>Don't have the need</td>
<td>University buildings frequently offering</td>
<td>But there are many times when VC costs and difficulties outweigh</td>
<td>I don't but would like to!</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Conference facilities should have video-conferencing capabilities</td>
<td>the time and flight savings. Reading people's body language is crucial sometimes</td>
<td></td>
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<td>---------------------------------------------------------------</td>
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<tr>
<td>I was happy to use the University's facilities, and the member in staff who assisted (Rosemary Rodd) was very helpful. They are or feel, however, remote from the rest of the University, high up in the New Museum Site.</td>
<td>Decreased carbon emissions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased carbon emissions</td>
<td>No information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't know where it is, how much it costs, or how to use it.</td>
<td>don't really need it right now</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease compared to moving around for conferences / meetings</td>
<td>None of the above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>face to face better</td>
<td>not needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental benefit</td>
<td>Other staff members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getting access to conference spaces (already booked out etc.)</td>
<td>several of the above! particularly dedicated facilities but also general meeting facilities</td>
<td></td>
<td></td>
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<tr>
<td>Environmental considerations, carbon reduction</td>
<td>Word of mouth</td>
<td></td>
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<tr>
<td>Have not used VC before</td>
<td>instant response to questions which are difficult to write in an email or where one does not want to write an email</td>
<td></td>
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<tr>
<td>I am not prevented from using video conferencing</td>
<td></td>
<td></td>
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<tr>
<td>I don't know the costs, but if there are any this explains why my dept doesn't advocate its use. I have had quite a</td>
<td></td>
<td></td>
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<tr>
<td>reaching remote teachers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment</td>
<td>Reduced Carbon Footprint</td>
<td></td>
<td></td>
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<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td></td>
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<tr>
<td>I don't need it</td>
<td>Reduced Carbon Footprint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don't use it personally. The department has used it for interviewing</td>
<td>Reduced emissions</td>
<td></td>
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<tr>
<td>I have had little need to use video conferencing so have faced few barriers to date. However, as a PhD student I would find cost and access to services difficult (I think)</td>
<td>Reduced environmental impact</td>
<td></td>
<td></td>
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<tr>
<td>I have used it in previous employment but not here</td>
<td></td>
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<tr>
<td>I have used it when appropriate. do you mean skype video? or proper video conferencing in the special room? this is unclear - so your answers might be biased and not accurate if people define video conferencing as different things.</td>
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<tr>
<td>I use Skype on my laptop, didn't know other services were available</td>
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<tr>
<td>I, myself, don't have a particular need for it. I do recommend it to</td>
<td></td>
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<tr>
<td>Reason</td>
<td>Answer</td>
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<td>-----------------------------------------------------------------------</td>
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<tr>
<td>colleagues who ask for advice, but they rarely take it up, preferring to use free services.</td>
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<tr>
<td>lack of equipped quiet room in department easy to book</td>
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<tr>
<td>lack of knowledge of cost-benefits</td>
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<tr>
<td>lack of portability of good quality video conferencing services</td>
<td></td>
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<tr>
<td>Lack of reliable and convenient facilities on my devices that are compatible with technologies in other institutions</td>
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<tr>
<td>Like to travel</td>
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<tr>
<td>Need a quiet, smart room to use it in</td>
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<tr>
<td>Never occurred to me</td>
<td></td>
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<tr>
<td>No accessible space to call from</td>
<td></td>
<td></td>
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<tr>
<td>no need to use</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>No need within the work I do</td>
<td></td>
<td></td>
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<tr>
<td>no opportunities that require VC</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>No video conferencing facilities in our office</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Not always necessary</td>
<td></td>
<td></td>
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</tbody>
</table>
Not aware of facilities in the university

Not aware of options

Not knowing it's there

Not needed for job

Not practical in TES

Not required. Phone or email covers everything I need to do

Nothing does prevent me

Only when an in-person meeting is a better option (networking, relationship building etc..)

The existing facilities are not convenient.

The impersonality of delivering a paper from a video-conferencing suite to a remote conference.

The interaction isn't as great and the chemistry cannot be evaluated as well

time to organize logistics

Time-zone differences mean anti-social hours

Usually the other partner does not have a Skype account or that their company will not
allow them to use skype or related software.

We do it at our lab, with our own means of technology.

We have used Skype only - have not used the University's video conferencing suite