

INDUSTRIAL PROJECT ASSESSMENT USING VIRTUAL MEANS – A WAY FORWARD?

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ABSTRACT

The involvement of industry within university environments providing collaborative projects are well established and has provided some good results over time with many higher education institutions (HEI). The main issue with collaborative projects has been the time taken out of the workplace for the industry contacts and their availability to set and assess the project results in a timely manner, in person. This in effect may limit the enthusiasm for industrial partners to become involved in the setting of projects and allowing industrial staff time to commit to setting and marking the results.

The paper will focus on examples of industry collaborative projects where there has been an element of setting and assessing student's work using virtual tools such as teleconference, web based live meetings and video conferencing. The paper will focus on the industrial and HEI perspectives on the methods and develop a time and cost effective framework for future collaborations for all involved.

Keywords: Industrial collaboration, design projects, 'live' briefs, industrial briefs, virtual meeting tools

1 INTRODUCTION

The basis for this paper is my on-going work with a number of HEIs and setting industrial based projects with my employer. The projects have seen considerable success from an HEI and industrial perspective and virtual tools have been used to assign, interim assess and mark projects. The experience gained from these exercises has provided a framework for operation in future projects. The methods described also give students an insight into how modern companies network, communicate and assess information which is invaluable for life outside academia.

Coming from industry there were a few issues that normally act as a barrier to those wanting to become more involved. My time working for Nokia showed that a balance between work, life and some involvement with academia could be made with positive results in all areas

The barriers for individuals not getting involved are quite traditional and interesting. If we disregard individual's motivation – those that truly want to get involved and those who do not, we will see that there are two factors that can be clearly identified.

- a. The first is time. In my capacity as a global trainer I always looked at the work / life / time balance and any methods that could be used to reduce the amount of travelling or optimising the time spent in one office would be beneficial for time. Industry have embraced the use of virtual meeting tools, whether it be simply a telephone conversation to a fully interactive video meeting, virtual meeting tools are now being used at all levels from small business up to multinational conglomerates.
- b. Time is not the only benefit. Due to the reduced amount of travelling money savings can be seen as well as an increase in personal time with families and friends that can only be of a benefit to all. The use of virtual meeting tools can be used in a lot of cases however studies have shown for the best results it needs to be mixed with some in person interaction.

My personal experiences in collaboration with HEI's stem from personal contacts at three major UK Universities and the universities desire to have live project briefs from a well-recognised brand. My passion for developing the next generation of Engineers and Designers stems from my career and wanting to give something back to the next generation. The involvement with the HEI's and balancing this with a full time international role meant that time was optimal and personally I could not be at the HEI's on every occasion needed. There was a need to be more creative with time and looking at best

practice and time saving tools from industry showed there could be some good practice transferred to the HEI's.

2 INDUSTRIAL BEST PRACTICE AND PERSPECTIVES

Industry has the advantage of being able to implement and afford newer technology which has a time, money or other benefits for the business. The use of virtual meeting tools has been accelerated partly by the time saving nature of the tools, reducing the amount of financial expenditure from travel and the time saving from individuals being away from the place of work but also by the financial squeeze on business meaning that more cost effective communication methods are needed.

The tools used for virtual communication can be basically broken into three areas which in some cases interact with each other. These are:

a. Voice tools

In its most simplistic form this is picking up the phone and talking to the person you want to talk to. Multi user calls are also possible, with many operators offering business multi call lines with up to 99 users possible on some providers. Internet based services such as Skype or voice conference through IP also compete in this competitive market place. [2]

b. Text based communication tools

The ability to communicate and show presentations is a valuable. Tools such as Microsoft LiveMeeting and Communicator fill this gap and are used as part of the Microsoft office package or from a free download through Microsoft. [1]

c. Video based communication methods

Video based collaboration tools vary in complexity, from simple webcams built into laptops to immersive interactive dedicated rooms such as those provided by the Halo Company. When Virtual meeting tools are mentioned these are what most people think about

The use of the above tools not only saves time and money but allows for a truly international form of communication between different sites and manufacturers which can be in different time zones. It can, if used properly optimise the development and introduction of products. It makes business an international concern. This aspect of communication is important to stress and demonstrate to students, to give them an appreciation of the importance of virtual meeting tools in everyday life. It is also important to teach where they are best used, how to use them and the boundaries for its use.

Looking at the industrial perspective on these tools and my experience of using them in project related terms and training environments the following learning's can be concluded:

- Virtual meetings vs. face to face meeting split?
- Understanding your audience
- Keep communication simple
- A picture can say a thousand words
- Don't always rely on the connection
- Dealing with the time zones
- Dealing with the lack of personal queues

3 ACADEMIC PRACTICE

Academic experience in this area based on my experience has been limited and HEI's have not been progressive in using virtual meeting tools in projects with students. The HEI's have been aware of the tools and in some cases, how to use them however the opportunity to use them has been limited and not implemented. The HEI's have a traditional approach to training [3] however the infrastructure is already in place in most institutions to run basic voice conference activities through to interactive live meeting collaboration and in some cases video conference sessions in the larger lecture theatres. In most cases this needs to be pre-arranged and assisted by technical staff however it is possible.

Reasons for this vary. Need is one factor. Some courses do not justify using such tools and it would be a distraction to the more traditional teaching methods. Class size is another barrier. Larger lecture groups mean less interaction and some of the virtual meeting tools do not lend themselves to lots of people being in the teaching session.

The need to introduce visiting lecturers into the HEI's to deliver projects or critique work may drive the need for more flexible teaching methods to be used such as virtual meeting tools. Time is precious and visiting lecturers may not have the time to appear in person. If a framework for the operation of these tools is in place with the HEI's backed up with some good examples then more industrial based experts may want to become more involved with presenting at Universities.

The student element also needs considering. There are two sides to this. The first is the way that the students perceive how knowledge is taught to them and in some cases virtual means may not be the best way to illustrate complex issues. The techniques lend themselves to well-structured presentations that are to the point and not ambiguous. An example of this is a project brief or feedback on a problem or issue seen. This is parallel with industry practice where the tools are often used for structured meetings where the outline of the issues is known and objectives for the meeting agreed. The second aspect is the student's need to develop and appreciate the tools used in industry and exposing the students to the use of virtual meeting tools is way of providing valuable experiences before graduation. To summarise, the HEI's are still quite traditional in the ways that communication methods are used and taught to the students and this in some way does not completely prepare the students for life after university. At the same time a balance is needed between exposing the students to the tools and teaching them how to use them correctly and at the right times. These observations are based on work carried out with my industrial live projects at a number of HEI's over the last three years. The following paragraph explores some of these areas in more depth and expands out on the issues.

4 PROJECT EXAMPLES

I have a number of examples where virtual means have been used to deliver project briefs and lecturing sessions. The three examples I will provide are from work carried out at Bournemouth University delivering revision material to the 2nd year undergraduate cohort in their professional engineering studies module and to students at Bournemouth University on the product design course doing an industrial led project.

Brunel University – Professional Engineering studies revision sessions

In 2012 I delivered a series of six lectures as a visiting lecturer on Professional Engineering in the wider community at Brunel University and as part of this I asked to write an exam question on the subject. In connection to this activity and alongside some conventional revision lectures two one hour revision sessions have been prepared which are to be delivered virtually through telephone conference and live webcast to the students. The telephone call is from a free phone line at no cost to the student and can also accessed through a computer system. The webcast is through my company website and is an open access format that is accessible through the website. Questions can be asked via web chat.

The delivery of the material will take place in April 2012 and is designed to complement, not replace traditional lectures and offer those that would like additional support the help needed.

Pursuing this method saves me travel time, money and allows me to deliver the material whilst abroad.

Bournemouth University - Mobile phone accelerometer projects one and two.

In 2010 and 2011 I was asked by Bournemouth University to deliver an industrial based project to the 2nd year product design and 2nd year Design Project Management students. In both cases the students had the mobile phone accelerometer project to do, which involved working individually to solve a design brief. In both cases, due to restrictions with my availability the project was briefed and delivered to the students via Telephone conference and the slides presented via Microsoft LiveMeeting. This was received well by the students and any questions were addressed during the presentation and after via e-mail. The presentation was followed up by a visit to the students in person to answer questions and give an interim critique. For the assessment, the projects were submitted virtually and reviewed by the University and myself then feedback was given virtually. The feedback received from the staff at the university and the students was positive. They liked the real life aspect to the presentation method, the interaction aspect in the middle and generally the overall feel of realism. From my perspective it allowed me to travel internationally and deliver project briefs to the students and assess the work whilst maintaining my commitment to the university.

The above work has developed into a framework for operation which is now used by me to deliver projects virtually.

5 FRAMEWORK

The framework is simplistic and can be adapted to the delivery of project briefs or other information. There are six criteria that need to be satisfied before proceeding with a virtual delivery method and these are shown in figure 1.

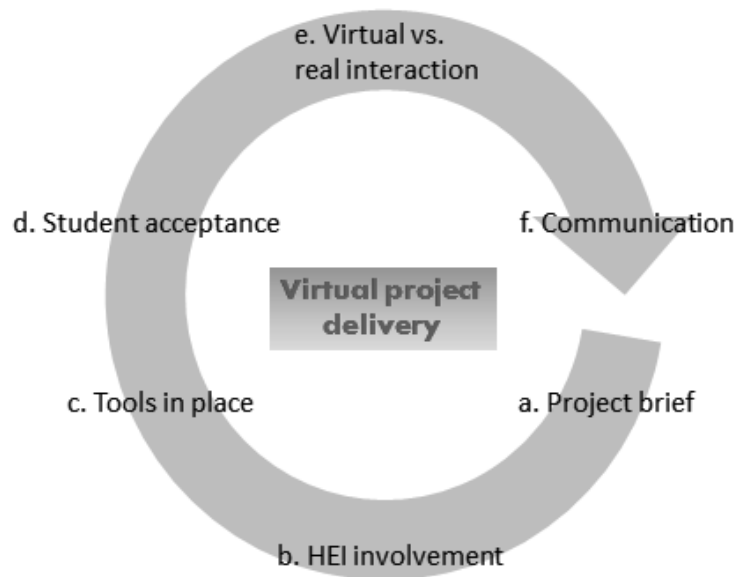


Figure 1. Six criteria for virtual delivery methods

An explanation of each is as follows

- a. The subject being flexible and simple enough to deliver virtually. The subject matter needs to be easily converted to voice and text without being too in depth or complex. Presentation material needs to be short and to the point. Objectives clear and what is required from the students clearly defined as do start and end dates.
- b. The desire of the HEI to support the method. The HEI needs to buy into the idea of delivering a project in this way. It is different to traditional methods and if the HEI do not want to deliver content in this way it may not be the best way to proceed.
- c. The HEI having the necessary equipment and support to deliver the content. The HEI need virtual meeting tools and the ability to operate them. Telephones, networked computers and video presentation equipment are necessary and the technician support which is flexible enough to operate them and react to issues that may happen.
- d. The students being open to using the delivery methods. The students need to be accepting of the idea of using virtual methods and be able to interact. This may need encouragement from the HEI staff to use the tools
- e. Do not deliver the entire project virtually. An element of personal interaction is key. The model used delivers the brief virtually, and then has a visit to the HEI to answer questions and provide an interim critique of progress and then final submission results via virtual means. It is critical to do this as the personal interaction element is critical. This has been learned from industry and is needed for success.
- f. The ability to close the loop between the students and individual setting the project is critical. The person setting the project should allow the students to communicate with them with questions and issues. Means to do this are ideally via e-mail or through communicator methods.

6 CONCLUSIONS AND THE WAY FORWARD

The use of virtual means to deliver material in HEI's is not a new concept however it is one which needs development and more effective deployment. The results of the projects I have worked on has yielded positive results from all involved and will be taken forward to future projects and ways of working.

The involvement of industrial visitors is critical to HEI's to maintain relevant content on their courses and any experience that can be given to the students in tools used outside of the HEI's for communication can only be a positive move for their personal development.

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