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THE BEST PRACTICE FOR VIRTUAL CONFERENCE / DISCUSSION IN HIGH TECHNOLOGY AREA

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This thesis is submitted in partial fulfilment of the requirements for the degree of Master of Research.

ABSTRACT

This thesis presents analysis of virtual conference. It describes the virtual AS-IS process model, the user groups and the features that are concerned with virtual conferencing. An analysis of asynchronous Vs synchronous conferencing for a high technology business environment is presented.

The identified best practise for virtual conference in high technology area and the resulting best practice checklist for virtual conference management and development are determined.

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NOTATION

DE	Decision Engineering Mission Member
DEMM	Decision Engineering Mission Members
SSADM	The Structured System Analysis and Design Method
DTI	Department of Trade and Industry
ITS	International Technology Promoters
DFD	Data Flow Diagram
LDS	Logical Data Structure
BSO	Business System Option
ELH	Entity Life History
MUVE	Multi-user Virtual Environment
MOO	Multi-user Dimension Object-Oriented
IRC	Internet Relay Chat
BBS	Bulletin Board System
CPN	Coloured Petri Net
CORK	Content Object Replication Kit
GUI	Graphical User Interface
DVLE	Distributed Virtual Learning Environment
WSC5	5th World Conference on Soft Computing
WSC6	6th World Conference on Soft Computing
TEAM	Team Based European Automotive Manufacture
IT&T	Information Technology and Telecommunication
CASE	Computer Aided Software Engineering
ISE	Information System Engineering
RAD	Rapid Application Development
DSDM	Dynamic Systems Development Method
CCTA	Central Computing and Telecommunications Agency
UML	Unified Modelling Language

CHAPTER 1 - INTRODUCTION

The aim of this chapter is to provide an overview of the research project and its importance to the sponsoring company. It will also provide an overview of the aim and the structure of the thesis.

1.1. Project Overview

As enterprises become more competitive and widely dispersed, and the competitive environment makes face to face time more precious it is becoming difficult to get the right people together at the right time to create, discuss and move forward ideas of organisational concern.

The Internet is now used by almost every contemporary enterprise around the globe and now with greater bandwidths people can conduct virtual discussions, anytime, anywhere, and at a minimal cost and implementation effort.

Cranfield University headed an overseas mission to Russia, which aimed at identifying the levels of technology used in Russia and to help establish the framework for future collaboration in Decision Engineering areas.

Decision Engineering is a discipline that aims to develop tools and techniques for informed operational and business decision making within industry by utilising distributed organisational knowledge and data.

The main focuses for Decision Engineering are:

- Cost Engineering
- Intelligent Systems
- Knowledge Capture and Reuse.

The Mission helped in developing the links with leading figures in the Russian engineering industry, and will contribute to improve competitiveness of UK industry by making it more aware of developments and technologies available in other countries. This will also help Russian Industry through technology transfer in Decision Engineering areas.

The objectives for the mission were:

- To identify the level of technologies used in Decision Engineering within Russian aerospace, transport, and oil and gas sectors.
- To understand the business model of co-operation between UK and Russian Companies and academic institutions for future financial benefits.
- To improve the competitiveness of UK industry by making it more aware of development in management of best practice in Decision Engineering in the Russian Federation.

One identified framework for future collaboration in Decision Engineering and achieving the mission objectives is through the use of virtual conference / discussion.

This research identified the user requirements for virtual conference / discussion in a high technology area, namely Decision Engineering and identify best practice in virtual conference / discussion.

1.2. Project Stakeholders

This project has three main stakeholders, the sponsoring company Department of Trade and Industry, the Decision Engineering Mission and the Department of Enterprise Integration, Cranfield University.

1.2.1. Department of Trade and Industry International Technology Service

The Department of Trade and Industry's (DTI) International Technology Service (ITS) helps British business to identify and learn from leading organisations around the world to improve their competitiveness at home and abroad.

The International Technology Service provides a variety of services which aims to achieve the above mentioned.

1.2.2. Globalwatchonline

Globalwatchonline provides UK businesses with immediate access to over a million documents from 600 global web-sites. It provides up-to-the-minute data on business and technology developments world-wide, incorporating a database search and auto-alert service.

1.2.3. Global Watch Magazine

Global Watch magazine brings news of the latest technological developments from around the world to UK businesses. Through case studies, reports on technology developments world-wide and details of events and missions, the monthly Global Watch focuses not only on businesses in emerging technology markets, but also on innovation in the traditional areas of industry.

1.2.4. International Technology Promoters

International Technology Promoters help UK companies learn more about, and access, technology developments and opportunities in key overseas countries. ITS has a team of Technology Promoters who focus on the Asia pacific region, North America and Europe. This service provides consultations, hands-on assistance or specific assignments for firms interested in improving their technological capability through international licensing and partnerships.

1.2.5. International Secondments

International Secondments support UK companies, financially and practically, in overseas secondments of individuals from any discipline to any country for periods of three to 12 months to learn best practice, understand new developments in technology and develop overseas links. The programme focuses on SMEs (small and medium-sized companies with up to 250 employees. (www.dti.gov.uk/its.html)

1.2.6. Overseas Missions

Overseas Missions back short fact-finding overseas visits by small groups of technical experts from UK companies, to identify and learn from the best practice and technological developments in leading companies overseas. ITS funds the travel costs and helps towards the sponsoring body's costs of organisation and promotion.

1.3. Decision Engineering Overseas Mission

Decision Engineering is an emerging discipline that aims to develop tools and techniques for informed operational and business decision making within industry by utilising distributed organisational knowledge and data.

The mission in Decision Engineering focuses on three main areas:

- Cost engineering
- Intelligent systems
- Knowledge capture and re-use.

The subject areas of the mission were: Cost Estimation and Cost Engineering in Aerospace, Transport, Oil and Gas Industry; Knowledge Capture and Reuse, Intelligent Systems application in Industry for decision making and collaboration.
The main objectives of the mission are to:

- Identify the level of technologies used in Decision Engineering within Russian aerospace, transport and oil and gas sectors
- To understand the business model of co-operation between UK and Russian Companies and academic institutions for future financial benefits
- To improve the competitiveness of UK industry by making it more aware of development in management of best practise in Decision Engineering in the Russian federation.

The aim of the mission was to explore any opportunity in Decision Engineering areas in Russia for the British Industry. Accompanied by representatives from Cranfield University, Rolls Royce, BTExact, Corus Rail Technologies, Elbrus Technologies Ltd, the Association of Cost Engineers and the DTI International Technology Promoter for Russia. Juan Matthews the mission team set itself the primary task of identifying the level of development and use of these technologies in Russia. This was arranged with the help of the British Consulate General in St Petersburg and the Assistant International Technology Promoter at the British Embassy in Moscow. Dimitri Popolov, the group's itinerary included visits to Moscow State University, the Russian Academy of Sciences, St Petersburg State Technical University, the Loffe Institute, the Aerospace Devices University and a range of large and small companies including Tupolev, Aviation Euro-Russian Consortium, LUXOFT, Petrocom, EPAM Systems, BeePitron and Digital Design.

It is observed that Russian academic Institutions are going through a transition to collaborate with commercial organisations and industry. The wealth of knowledge and motivation for research are very high. With Russian globalisation and cheaper cost base the researchers in intelligent systems and software development provide good opportunities for the British Industry. Russian industries are becoming more flexible and many of them are strongly motivated to enter the global market. Highly skilled software professionals at low cost and a smaller and agile management structure provide lucrative outsourcing opportunities for the British companies. In the areas of Cost Engineering and organisational knowledge capture and reuse through system development, there are opportunities to sell British skills and

experience to Russia. (R. Roy, V. Taatoukhine, *Decision Engineering: Informed Operational and Business Decision Making with Industry*, 2002)

1.4. The Structured Systems Analysis and Design Method (SSADM)

This project is concerned with the capture of user requirements for Virtual Conference. Through the extensive literature review (Chapter 2) SSADM was identified to be the most appropriate methodology in the identification of these requirements.

Therefore this section will describe the structure that SSADM suggests should be adopted.

SSADM consists of 5 main modules, which are in turn broken down into a complex hierarchy of stages, steps and tasks.

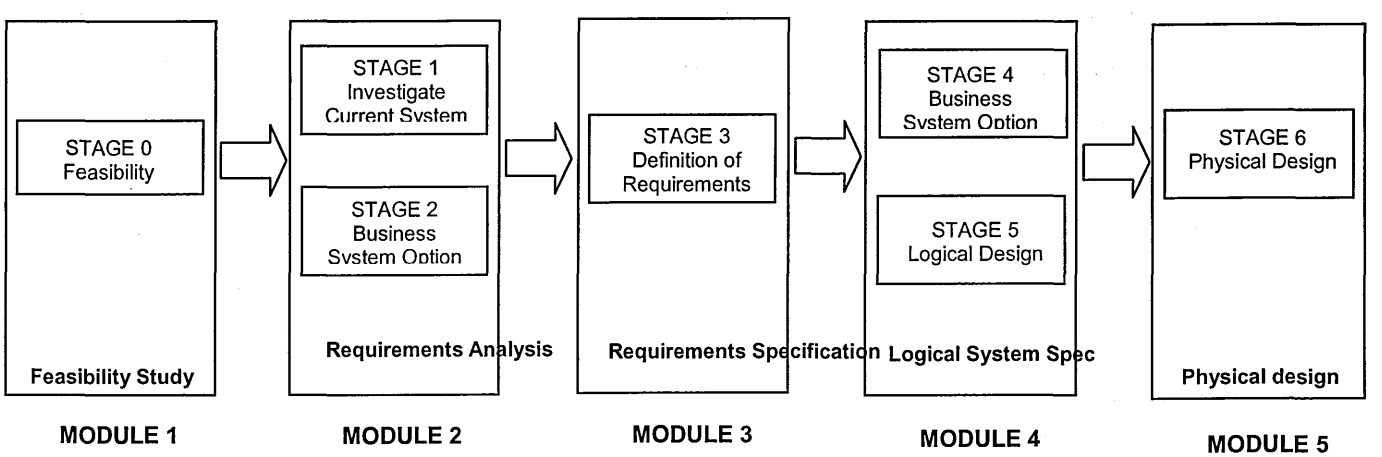


Figure 1: Module & Stage Framework of SSADM

- Feasibility Study; Module 1 the feasibility study consists of a single stage (Stage 0 Feasibility), which involves conducting a high level analysis of a business area to determine whether a system can cost effectively support the business requirements. In stage 0 an overview DFD is produced together with a

high level LDS. At this stage the DFD will represent the existing system warts and all and the LDS may be incomplete and contain unresolved M:M relationships.

- Requirements Analysis; Module 2 requirements analysis consists of 2 stages; Stage 1 Investigation of Current Environment and Stage 2 Business System Options (BSO). During stage 1 the systems requirements are identified and the current business environment is modelled in terms of the processes carried out and the data structures involved. During stage 1 DFDs and an LDS are used to produce detailed logical models of the current system. During stage 2 up to 6 business system options are produced and presented. As a result one of these options (or indeed a hybrid solution) is adopted and refined. During stage 2 DFDs and LDS are produced to support each business system option and the final chosen option. The transition from stage 1 to stage 2 is a key part of SSADM, this is where we move from a logical model of the current system to a logical model of the required system. I.e. this is where the DFDs and LDS have to be refined to cater new and changed requirements.
- Requirements Specification; Module 3 Requirements Specification consists of a single stage (Stage 3 Definition of Requirements) which involves further developing the work carried out in module 2, detailed functional and non-functional requirements are identified and new techniques are introduced to define the required processing and data structures. In stage 3 the DFDs and LDS are refined and cross validated in the light of the chosen business system option. The LDS is enhanced using relational data analysis (normalisation). The DFDs and LDS are validated against the ELHs also produced during this stage. DFDs LDS and ELHs are used as input the subsequent stages of SSADM.
- Logical System Specification; Module 4 Logical System Specification consists of 2 stages; Stage 4 Technical System Options and Stage 5 Logical Design. In stage 4 up to 6 technical options (specifying the development and implementation environments) is produced, one being selected? In stage 5

the logical design of update and enquiry processing and system dialogues menus etc, are carried out.

- Physical Design; Module 5 Physical Design consists of a single stage (Stage 6 Physical Design) in which the logical system specification and technical system specification are used to create a physical database design and a set of program specifications.

This project is concerned with module 2 and 3 of SSADM, the Requirements Analysis and the Requirements Specification. SSADM is discussed in more detail in chapter 2.

1.5. Thesis Structure

The structure of the thesis is illustrated by figure 2 and it relates to the research programme outlined in chapter 3.

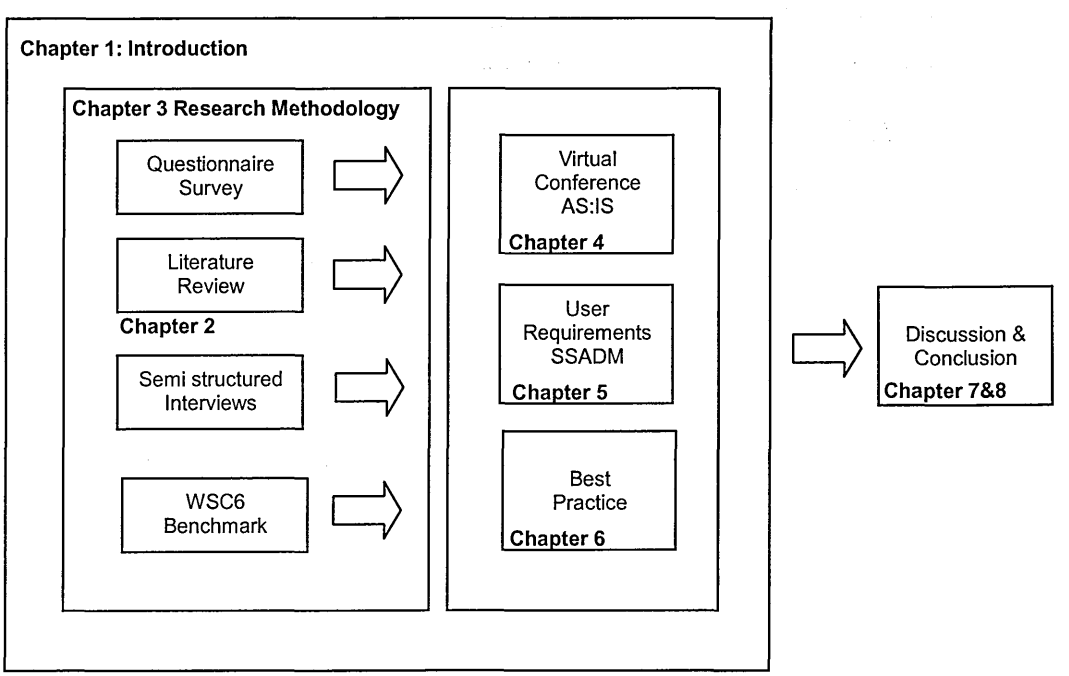


Figure 2: Thesis Structure

Chapter 1 outlines the project and sets the context for the topic of research. It then presents the project stakeholders.

Chapter 2 presents an extensive examination and analysis of the different applications of virtual conference. It presents extensive examination of software requirement capture techniques through a review of the appropriate literature, which sets the ground for the rest of the research.

Chapter 3 provides a detailed set of project objectives and boundaries and presents the research methodology.

Chapter 4 presents the analysis and lifecycle of real and virtual conference and presents state of the art in virtual conference.

Chapter 5 provides the analysis of the user requirements, identifying what is required for virtual conference in Decision Engineering through SSADM.

Chapter 6 presents the identified best practice in virtual conference in high technology area.

Chapter 7 will discuss limitations of this project and its contribution to knowledge.

Chapter 8 identifies and discusses the conclusions to the project.

1.6. Summary

In order for the future collaboration between Russia and the UK in Decision Engineering and achieving of the mission objectives, it has been identified that a 'way forward' is that of the use of a virtual conference.

For the use of virtual conference to be achieved successfully it is necessary to identify user requirements and best practice in virtual conference in a high technology area.

Therefore an extensive literature review in virtual conference and requirement capture techniques is presented.

CHAPTER 2 - LITERATURE REVIEW

This chapter will review the extensive literature that is related to this project. As outlined, this project is concerned with the capture of user requirements for virtual conference in high technology area. Therefore the literature review will focus on previous work with regard to the area of virtual conference management and design. The use of virtual conference for education and business purposes and user requirements for capture approaches and techniques.

2.1. Virtual Conference

Virtual conferences are the gathering of people on the Internet for a variety of purposes from formal meetings to information exchange, to ideas generation and social exchange. The virtual conference uses a variety of communication tools that enable people to participate without being in the same geographical location. It includes both synchronous (real time) and asynchronous (any time, any place) conferences and uses different types of software. (On-line Conferencing, 2001)

2.1.1. Definitions

In the past few years, group work and collaboration using online environments has become an important research topic because of the interconnectivity enabled by the Internet, and more specifically, the World Wide Web.

According to the book *The Virtual Community*, Howard Rheingold defines virtual communities as "social aggregations that emerge from the Net when enough people carry on...public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace". This general definition takes in a variety of different kinds of communities, which rely on different kinds of computer communication.

Virtual conference is considered, according to *'Designing the virtual campus',* as a virtual place that provides a virtual community with information and interaction. (Design Studies, 1999).

The virtual conference consists of many components that add up to the sum of 'Virtual Conference'.

Design Studies (1999) suggest that a virtual conference consists of a synchronous virtual place, which contains classrooms, offices and resource rooms all accessed by a web page and a desktop browser. A virtual conference is suggested by Groeling (1999) to be an asynchronous message board where email like messages are posted on to a web-page for people to access. Where as, K. V. Rao's (1998) work on the historical development of a virtual community suggested that virtual conference beginnings consisted of an email network. This shift in the perspective of what is a virtual conference has changed due to the technological advancements in the Internet, the World Wide Web and the speeds and compression rates of data.

2.1.2 Virtual Conference

The 8th International World Wide Web Conference organisers suggest and present their interpretation of a virtual conference as a 2D format. The conference contains the following areas Conference Program, Week-At-A-Glance, Birds-of-a-Feather, Tutorials, Workshops, Developers Day, and Pre-Conference Courses. This can be seen to be a very readily used format in that contents are presented to the participants in a 2D format and the participant interacts with area that are conventional to a real conference.

Were as webconference.com present and suggest that virtual conference should contain real-time interaction through the use of video casting and live audio streaming. They suggest that every participant needs to be online at the same time for the interaction, presentation, lectures and workshops to be presented. They do

suggest however that like the previously mentioned 2D formatted conference the participant should be guided and be presented with areas similar to that of a real conference.

2.1.3. Virtual Community

The Internet has helped to reduce the barriers of access to information and help reduce the differences between big and small companies since they all share the same Internet web space in the same way. Internet can be seen as a global phenomenon creating a world with no boundaries and a powerful medium that makes distances irrelevant in building communities.
K. V. Rao (1997) described the building of virtual community using the Internet and how the first virtual community was achieved. In general, news and discussion groups were the means to which people made contact within this first online community.

One basic kind of computer-mediated communication tool in which communities flourish is the Bulletin Board System (BBS) which Rheingold (1993) claims first appeared in 1979. The early BBS contains several electronic bulletin boards: other users call the owner's computer with a modem connected to their computer. They then read what the other users have written, and write their own message back. In this way users discuss their interests, discover each other's personalities, make friends, and make enemies. A BBS looks a lot like an email; the major difference is that the messages are available to anyone that subscribes to BBS. As the people read and reply to these messages they get to now each other and a sense of community develops.

Another different format for virtual communities is Internet Relay Chat (IRC). This software allows groups of people to communicate and interact through their computers at the same time. The talking occurs by typing messages into a shared window. Since it happens in real time, IRC allows for a different kind of personal interaction from those using BBS. One aspect is that the person is not visible unless talking. Like BBS, IRC has its technical limitations: it is limited to the

exchange of text between people-there is no 'environment' for the user to interact with. BBSes allow asynchronous communication and IRC allows synchronous communication.

There is another more complicated technology and the state of the art in virtual conference, in which virtual communities communicate the Multi Users Virtual Environments (MUVE). A MUVE is an inherently collaborative computer environment that provides facilities for navigation around virtual places and actions by the participants as well as communication. The reasons for joining a MUVE is not just to talk to other people, but to establish an identity that lasts beyond the session during which you are connected. The development of identity in MUVEs is a topic of great interest to researchers. Early MUVE were commonly called MUDs (Multi- User Domain) and MOO (Multi-user Dimension Object-Oriented). Recently, MUVEes have ceased to be limited to text-only environments, and Web interfaces have now been developed (Design Studies 20, 1999).

2.1.4. Virtual Education

The majority of studies into virtual conference have been concerned with the benefits or issues that virtual conference can have in the areas of academic and education environments.

A good example of this is at the Architectural and Design Science, University of Sydney. They have done work in designing and implementing a virtual campus. The work was focused on the design of a virtual campus that provides an environment on the Internet for learning and community development in similar ways to a physical campus (Design Studies 20, 1999). The environment that they are using is the MUVE as previously mentioned in 2.1.1. The objectives of the work was to support the following:

- Communication among students, instructors, and administrators:
- Online access to learning materials, lectures, and departmental services:

- A central campus environment for students to effectively 'bump into others' in the halls.

It provided two types of interactivity - interaction among people in the learning environment and interaction between students and online learning materials. The work also described the design process for a virtual place to be very similar to that of the design process of a physical place. Tim Groeling (1999) focused on one area of virtual conference which is the use of message boards in learning, examining why these fail to live up to their promise as a teaching tool. The work compares costs and benefits for the use of message boards. One main conclusion from the study is that people costs - in terms of learning costs, monitoring costs and opportunity cost far out way the benefit when using the message board. Also to reply to a posting, the user will receive no informational benefit, meaning they have little or no incentive to take part in this action.

Collaborative knowledge building using text-based via synchronous and asynchronous discussion forums and visual techniques in the form of virtual objects, pictures, and photos was studied and a qualitative evaluation of the activates performed in this environment was undertaken by M. Beatrice Ligorio (2001). The main focus of this work was that of creating a virtual world that was generated in the context of a joint research project between The Netherlands and Italy whose aim was: - the facilitation of cross-cultural communication between schools. The virtual world was called Euroland. The study identified the different activates eliciting the interaction of different communication formats within a virtual environment. The communication formats were visual/iconic versus text based communication and synchronous versus asynchronous communication. Design and development of a prototype system of the virtual community based interactive learning environment, which supports human-human communication in addition to human-computer communication, with emphasis on social interaction was studied by Qun Jin, (2002). He proposed a conceptual framework for 'every-citizen' learning communities based on the Internet tool Multi-user Dimension Object-

Oriented (MOO). The work also discussed the basic guidelines, design issues, and several available solutions to realise a learning community. Other work in the area of virtual learning was a study of the three challenges encountered in the context of supporting network-based collaboration among middle and high school science students: integrating synchronous modes of interaction minimising consumption of bandwidth, and adapting non-collaborative software components for collaborative use. The study then moved to the development of a Content Object Replication Kit (CORK), a toolkit for building interactive Java-based collaborative systems for use on the web (Interacting with Computers 13, 2001). C. Bouras and A. Philopulos (2000) work was concerned with a web based Distributed Virtual Learning Environment (DVLE) that could be used as a tool for distant learning. The focus was on the design of the Graphical User Interface (GUI). The works developed models and architecture descriptions, functional specifications for lecture's virtual rooms, chat virtual rooms and discussed implementation issues.

2.1.5. Virtual Conference Interface

Another area of research that has been undertaken in relation to the virtual conference is the interface to which the virtual conference is accessed. All research has a common theme in that the interface to which the conference is fundamentally accessed is through a desktop browser.

One study was concerned with the investigation of the architectural requirements of tele-virtual conference and proposed a high level design of an Intelligent Multimedia Interface Unit capable of supporting tele-virtual conferencing in multimedia home computers. The three areas of investigation were the audio-processing module, video processing module and the media synchroniser. The interface was able to support panoramic, life like three-dimensional video images and stereophonic audio, so as to synthesise tele-conferencing environments (IEEE Transactions on Consumer Electronics, Vol 38, No, 2, 1992). Other work aimed at creating an approach to the multimedia based net-centric conference environment. The work explains problems associated with the well-known yet old-fashioned

parliamentary procedure, *Robert's Rules of Order*, which they suggest must be formally modelled and adapted to the modern net centric virtual conference where synchronism is hard to enforce. A prototype of their web browser based approach to developing 'Collaborative Net' was then developed. (IEEE, 1997). The work used Colored Petri Net (CPN) to model Robert's Rule of Order. This model describing the processes was then used to develop the 'Collaborative Net'. Robert's Rule of Order is concerned with the session and floor control rules commonly used for parliamentary procedures in Congress, corporations and institutes.

2.1.6. Virtual Conference Organisation and Management

Another important aspect of virtual conferences is the management and organisation issues that arise when participating in a conference. The majority of the research has been set in the context of academic conference management and organisation. Work by Olson et al, (1995) suggested that distributed working does require more of a group overhead than face to face meetings.

A paper on Virtual Conference Management System (Information Networking, 2001) was concerned with the development of a complete suite of integrated tools to support the planning, design and implementation efforts during the deployment of new network conference scheduling of an existing network infrastructure. The work was conducted in the context of an academic conference. The system identified 5 users:

- System administrator
- Conference Holder
- Referee(s)
- Author(s)
- General User(s).

The work modelled the processes that the above mentioned users would undertake and developed architectures accordingly. Design and implementation issues of the tools were also discussed.

A case study of *Organising an Online Soft Competing Conference* (2001) namely WSC5, was developed. The work summarised experiences from organising such a conference again the setting for the conference was an academic one. The case study described issues that should be made aware when conducting a conference. The main theme to these issues was that of management such as, the organisation of electronic files containing submitted paper, and the organisation of mirror sites to host the conference. The work also identified that it is very important to obtain feedback from the participants to see which parts of the conference were successful and which were not. Another project (D. Lawrence, R. Roy, and P. K. Chawdhry 2000) focused on the use of web space to host a virtual and terrestrial academic conference. The work deals with interactivity and organisational issues and compares three types of conference experience: traditional, virtual and webcast. The work is broken down into areas of Organisation: Social View and Technical View. Technical features and interactivity comparisons such as the content of information, effectiveness of delivery, type of information, mode of interaction, social need, psychological need, robustness, spontaneous creativity and role of media vis-à-vis the content.

2.1.7. Virtual Business

Virtual conference can greatly help business in that it can create high ROI by reducing or completely eliminating the need to travel to attend meetings or discussions of organisational concern.

A case study on the assessment of the current capabilities for distributed collaboration internal to Jet Propulsion Laboratory, as well as external was undertaken. (J. D. Baker, R. Bergman, 2000). The work provided a vision of greatly enhanced distributed collaborative capabilities in the near and far future. The work

was focused mainly on distributed collaborative engineering and science. Two areas of focus were the virtual workspaces and virtual conferences. The work was sectioned into; what work they do at JPL, the features that they require for collaboration environments for each of the data types and they discuss available tools for collaboration and then the work discusses the issue of implementation.
Work by Chris Carter and Andrew Mays (2001) presented a case study based on results of the Team-based European Automotive Manufacture (TEAM) project. TEAM investigates how advanced information technology and telecommunications (IT&T) could support co-operative working along the automotive engineering supply chain. Based on user requirements analysis, a software demonstrator was developed that incorporated video conferencing, shared white board, application sharing and product data management tools. The areas the collaboration were concerned with were that of:

- Communication
- Shared workspace and mutual awareness,
- Shared information and information management
- Group activity support.

The work suggests the system must be robust, easy to integrate with other company legacy systems, and the impact on the user and organisation must be carefully considered.

2.2. User Requirements Capture

Software success depends on developing a collaborative partnership between software developers and customers. Too often, though, the customer-developer relationship becomes strained or even adversarial. Problems arise partly because people don't share a clear understanding of what requirements are and who the customers are. (Karl E. Wiegers, 2000)

2.2.1. Definitions

Requirements capture is concerned with understanding needs. It is an analytic process in which representations of the system are produced that not only describe what is required but also help the designer to analyse situations. The result of the requirements capture process is

- A representation of the problems with the current system
- A representation of the requirements for a new system.

Dean Leffingwell and Leslee Probasco states the Rational Unified Process definition as:

- A requirement describes a condition or capability to which a system must conform: either derived directly from user needs, or stated in a contract, standard, specification, or other formally imposed document.

Requirements can also be seen as a software business term that refers to the agreement between a client and the suppliers of the software system about precisely what the system should do. Issues have to be worked in sufficient detail so that developers can actually get to work designing and building the system. Most requirements are not obvious. Rather they result from an intense collaboration among a business, user experience, and software engineering advocates charges with figuring them out.

2.2.2. Ten Requirements Traps to Avoid

Requirements capture should be done early in the software development lifecycle, as it is economical to think about what the system should be capable of. But once you start writing code, it becomes expensive, in time and money, to add or change a feature or function. Poor requirements are said to be a leading source of cost and schedule overruns.

'10 Requirement Traps to Avoid' is work that as its name suggests gives 10 possible area in which a requirement analysis should be aware of. The areas are as follows: (Wiegers, Karl E 2000)

- Confusion over "Requirements"

The work suggests that the simple word "requirements" means different things to different people. Another suggestion is that the users provide "the requirements," but developers still aren't sure what they're supposed to build.

- Inadequate Customer Involvement

This suggests that many projects seem to rely on telepathy as the mechanism for communicating requirements from users to developers.

- Vague and Ambiguous Requirements

Ambiguity is the great problem of software requirements. A more insidious form of ambiguity results when multiple readers interpret a requirement in different ways. Each reader concludes that his or her interpretation is correct, and the ambiguity remains undetected until later—when it is more expensive to resolve.

- Un-prioritised Requirements

Declaring all requirements to be equally critical deprives the project manager of a way to respond to new requirements and to changes in project realities (staff, schedule, and quality goals). If it's not clear which features you could defer during the "rapid de-scoping phase" late in a project, you're at risk from un-prioritised requirements.

- Building Functionality No One Uses

It is suggested that you should be aware of customers who don't distinguish glittery user interface from the essentials that must be present for the software to be useful.

- Analysis Paralysis

If requirement development takes a long time, it is suggested you might be a victim of analysis paralysis. Analysis paralysis results when the viewpoint prevails that construction cannot begin until the SRS is complete and perfect.

- Scope Creep

Most projects face the threat of scope creep, in which new requirements are continually added during development. Scope creep is most likely when the product scope was never clearly defined at the beginning. Requirement changes that "sneak in through the back door" rather than through an established and enforced change control process, lead to the schedule overruns characteristic of scope creep.

- Inadequate Change Process

The project does not have a defined process for dealing with requirement changes.

- Insufficient Change Impact Analysis

Sometimes developers or project managers agree to make suggested changes without carefully thinking through the implications.

- Inadequate Version Control

If team members can not distinguish different versions of the requirement documents with confidence, your version control practices are falling short.

2.2.3. Keys to Excellent Software Requirements

Section 2.2.2 suggests that while the above ten points are not the only ones that are likely to give problems they are among the most common and most severe. To avoid or control them, it is suggested that one assembles' a robust toolkit of practices for eliciting, analysing, specifying, verifying, and managing software requirements as stated below:

- Educating developers, managers, and customers about requirements engineering practices *and* the application domain
- Establishing a collaborative customer-developer partnership for requirement development and management
- Understanding the different kinds of requirements and classifying customer input into the appropriate categories
- Taking an interactive and a step by step approach to requirements development
- Using standard templates for your vision and scope, use case, and SRS documents
- Holding formal and informal reviews of requirements documents
- Writing test cases against requirements
- Prioritising requirements in some analytical fashion
- Instilling the team and customer discipline to handle requirements changes consistently and effectively.

The work concludes, suggesting that none of these solutions will work if you are dealing with unreasonable people who are convinced that writing requirements is time wasting bureaucratic overhead. (Karl E. Wiegers, 2000)

2.2.4. Requirement Capture Techniques

There are many requirements capture methodologies used by industry today, all of which are tailored to specific company practices, industries and software languages, or hardware platforms. There are even approaches adopted from disciplines as diverse as architecture and anthropology. While being systematic always helps, it is fair to say that none of these methods are clear winners.

Many techniques are used for eliciting user requirements, all of which attempt to include the voice of the customer in the product design process.

The Structured Systems Analysis and Design Method (SSADM)

In the early days of large scale information systems development many organisations used the Cobol programming language together with indexed sequential files to build systems for customer billing, payroll, stock control and a variety of other business areas. Developments at this time were characterised by:

- limited user involvement
- inadequate requirements elicitation
- use of ad hoc analysis and design techniques
- absence of CASE support for analysis and design
- time consuming use of 3GL tools
- In-flexible file and 3rd generation database management systems.

Frequently the results of this approach were systems, which, on delivery, did not satisfy business requirements. This caused extensive maintenance requirements and thus an increase in the applications backlog. A variety of problems may have caused the mis-match between system functionality and business requirements:-
A lack of ownership of and commitment to the system from users as a result of the low level of involvement;

- business requirements may have changed between inception and delivery
- requirements may have been misunderstood
- inadequate analysis and design tools and techniques may have been used
- a combination of all of these problems.

The response from the information systems community to these problems was the development of structured methodologies for ISE. The purpose of these methodologies seems to have been to:

(a) Formalise the requirements elicitation process to reduce the chances of mis-understanding the requirements and

(b) To introduce best practice techniques to the analysis and design process.

Initially developed under Learnoth Burchett Management Systems Ltd, SSADM (in common with other structured methodologies) adopts a prescriptive approach to information systems development. It specifies in advance the modules, stages and tasks that have to be carried out, the deliverables to be produced and furthermore the techniques used to produce the deliverables. SSADM adopts the Waterfall model of systems development, where each phase has to be completed and signed off before subsequent phases can begin.

SSADM (Structured Systems Analysis and Design Methodology) is a system of regular and orderly procedures, used in the analysis and design stages of systems development.

SSADM is popular among system analysis because it considers many different aspects of a project, functional and non-functional. It has a well-defined structure, which improves its usability on large multi-analysis projects and has clear management guidance through the associated management package, PRINCE. (Mander and Polack, 1995)

"SSADM has been used by the government in computing since its launch in 1981. It was commissioned by the CCTA (Central Computing and Telecommunications Agency) in a bid to standardise the many and varied IT projects being developed across government departments. The CCTA investigated a number of approaches before accepting a tender from Learmonth & Burchett Management Systems to develop a method." (Eva, SSADM Version 4 - A Users Guide)

Since 1981 SSADM has been further refined and version 4 was launched in 1990. SSADM is an open standard, i.e. it is freely available for use in industry and many companies offer support, training and Case tools for it.

Avison and Fitzgerald (1995) summaries the problems of the applications backlog along with a number of other issues which are potential weaknesses of 'traditional' approaches to information systems development. One of the responses to these problems from the information systems community was the development of structured methodologies for Information Systems Engineering.

RAD (Rapid Application Development, Martin, 1991) approaches began to be adopted in the late 80's and are based on a number of fundamental premises, the most important being the acceptance that business processing requirements will inevitably change during the development cycle of a system. In order to work with this fact of systems development like the RAD approach mandates as follows: -

- the use of 4th Generation Tools (to enable quick delivery);
- an interactive model of systems development which allows backtracking in the light of changing requirements;
- the use of evolutionary prototypes (SSADM adopts the adage that a picture is worth a thousand words, RAD goes a step further and advocates that a working model is worth a thousand pictures);
- a very high level of user involvement in the development process to aid in communications and to encourage feelings of commitment and ownership;
- the empowerment of highly skilled, multi-disciplinary teams consisting of users, analysts and technical specialists.

The RAD approach has been used successfully in many organisations and is currently gaining more formal support with the advent of DSDM (Dynamic Systems Development Method, DSDM Consortium, 1995), a framework for RAD.

Middleton et al (2001) identifies three main weaknesses of SSADM.
It is based on the waterfall model of software development,
There are limitations in trying to standardise professional practices for activities, which are so little understood.

The high level of prescription that accounts for much of the size and complexity of the methodology is not useful for practitioners. Three techniques are prescribed in such detail, without empirical justification, are not found to produce benefits and therefore ignored.

Mander and Polack (1995) found different problems in SSDAM specifications of different case studies and promote SAZ method integrating the formal notation Z into the structured SSADM

Ashworth (1998) compare SSADM with different methods and concludes that SSADM has been successfully used in different projects and has improved the quality of system analysis and design.

SSADM is one example of a structured methodologies, a variety of others are widely used in ISE.

Structured Analysis, Design and Implementation of Information Systems (*STRADIS*)

STRADIS is a methodology developed by Gane and Sarson (1979). The methodology is based on the philosophy of top down functional decomposition and relies on the use of Data Flow Diagrams.

Tourdon System Method

YSM: (Yourdon, 1993). YSM is similar to STRADIS in its use of functional decomposition, however a middle-out approach is adopted and slightly more emphasis is placed on the importance of data structures.

Method to Study and Realise Information Systems for an Enterprise

MERISE: (Quang and Chartier-Kastler, 1991). The methodology is widely used in ISE in France, Spain and Switzerland. MERISE consists of three 'cycles', the decision cycle, the life cycle and the abstraction cycle. The abstraction cycle is the key; in this cycle both data and processes are viewed firstly at the conceptual level, then the logical or organisational level and finally at the physical or operational level.

EUROMETHOD

EUROMETHOD: (CCTA, 1994) Euromethod could be described as a framework for the integration of existing European methodologies rather than as a methodology in its own right.

A framework for comparing methodologies developed by Avison and Fitzgerald (1995) is presented. The framework consists of 7 elements:-

- *Philosophy*: In their terms a philosophy is a principle or set of principles that underlie a methodology. In fact they define a *methodology* as a set of techniques underpinned by a philosophy.
- *Model*: The model is the basis of the methodologies view of the world, e.g. the Waterfall and Spiral models of Information Systems Engineering.
- *Techniques and Tools*: Typically a methodology adopts a set of integrated techniques, such as Entity-Relationship Modelling and Data Flow Modelling and may use CASE tools to support the techniques.
- *Scope*: The scope of a methodology defines its start and end points within the ISE lifecycle.
- *Outputs*: The outputs define the deliverables to be produced during the phases of the methodology.
- *Practice*: This element looks at the use of the methodology in terms of the differences between the theory and the practice.

- *Product*: This element looks at the nature of the product itself, in terms of documentation, CASE tool support, training courses etc.

2.2.5. Requirements Capture & UML

Many software teams are discovering that mixing use-case modelling techniques for requirements expression along with traditional methods of documenting specific requirements within a "*software requirements specification*" (SRS) document provides an efficient means to record the complete set of detailed requirements for a system or application to be built. (Dean Leffingwell, Leslee Probasco, 2001).

The authors suggested that a fully specified set of use cases for a system often does a great job of stating many of the requirements for that system. But just as often there are also a significant number of requirements that do not fit well within this modelling technique. Especially for non-functional requirements (e.g. specifications for usability, reliability, performance, maintainability, supportability), it is usually best to use tried-and-true traditional method for stating requirements.

Traditionally, requirements specified in an SRS are simple declarative statements written in a text-based natural-language style. Use cases should be viewed merely as an alternative for specifying requirements; moreover they describe complete threads, or scenarios, through the system which provide additional value in understanding the intended behaviour of the system. Use-case modelling is a hallmark of the Unified Modelling Language (UML) and the Rational Unified Process (RUP) as well as being a central feature provided by visual modelling tools, such as Rational Rose. In most circumstances use cases should simply be applied as an *added form of expression which increases understandability*, as opposed to simply replacing the specification of requirements in the traditional fashion.

The Use Case Model

Use pronounced "youce," not "youze" cases were introduced as part of an object-oriented development methodology by Ivar Jacobson in *Object-Oriented Software Engineering: A Use Case Driven Approach* (Addison-Wesley, 1992). More recently, Larry Constantine and others have extended the concept into a general technique for requirements analysis and user interface design. Each Use case describes a scenario in which a user interacts with the system being defined to achieve a specific goal or accomplish a particular task. Use cases are described in terms of the user's work terminology, not computerise. By focusing on essential use cases, stripped of implementation constraints or alternatives, the analyst can derive software requirements that will enable the user to achieve their objectives in each specific usage scenario.

2.3 Gap Analysis

Virtual Conferencing has been studied by different authors who propose more detailed methods of participating in a virtual conference as the internet and technology has evolved. Education participation and development of virtual conference has been seen to be that the largest area of study along side the management issues in academic conferences. The area of virtual community creation and the tools used to enable virtual community have been presented.

Were the studies fall short is the application of Virtual Conference to the business environment and the study of the management and best practice of a virtual conference in a high technology area as well as in-depth analysis of user requirements for virtual conference in high technology area.

2.4. Summary

This chapter has presented the extensive literature reviewed for the completion of this project with regard to virtual conference and requirement capture techniques.

It has also presented the gap in knowledge that this research fills. Therefore the next chapter will present the objectives and research methodology that was used in the project.

CHAPTER 3 – RESEARCH OBJECTIVES AND RESEARCH METHODOLOGY

This chapter provides a deep insight into the project, presenting the project objectives, scope and deliverables, and an analysis of the research methodology designed to achieve these objectives.

3.1. Project Aim

The aim of the project was to identify best practice in virtual conference in high technology area namely Decision Engineering, investigate state of the art in virtual conference / discussion and to identify user requirements for virtual conference.
The identified requirements would then be used for the development of a prototype virtual conference for decision engineering.

3.2. Project Scope

The boundaries of the project are defined around the capturing of user requirements and developing a SSADM requirement specification document for the 'Decision Engineering Mission Virtual Conference'. This specification is then passed on for the development of a prototype and a SSADM technical specification.
It is within the 'way forward' for the Decision Engineering Mission that a virtual conference was first considered as a means of further achieving the mission objectives. For a deeper understanding of the mission objectives please refer to chapter 1.3 of this thesis.

3.3. Research Objectives

In order to achieve the aim of the project the objectives were set to investigate and develop the following:

- Virtual Conference AS:IS
  - To develop idef0 models of the processes which are involved in real and virtual conference
  - To identify the types of virtual conference, the features and user groups of virtual conference
  - To identify works and survey commercial virtual conference products.

- User Requirements for Virtual Conference
  - To undertake requirements capture using SSADM for the use of virtual conference in Decision Engineering environment.

- Best Practice
  - To identify strengths with already existing virtual conference
  - To propose solutions to problems users defined in virtual conference
  - To utilise results to suggest best practice
  - A best practice checklist.

3.4. Project Deliverables

The outcome of this research consisted of the following, grouped around the research objectives.

- Life Cycle Models of Conference
- Paper based models of the whole life cycle of a virtual conference and its components.

- State of the art in virtual conferencing.
- A report on the state of the art in virtual conference and its use in industry.

- User Requirements for Virtual Conference

- A report stating the identified user requirements for virtual conference
- SSADM software requirements specification

➢ Best Practice

- A paper based handbook on the management and use of virtual conference for a high technology area.

Along side these deliverables, a conference paper was delivered.

3.5. Research Methodology

With the project scope and objectives identified, the project was structured into two areas of analysis.

➢ User Requirements Analysis of, Decision Engineering Mission Members, and World Conference on Soft Computing Attendees.

➢ Real and Virtual Conferences. What are they? What is state of the art in virtual conference? What are the management aspects of virtual conference?

The research methodology applied to satisfy the previously mentioned objectives consisted of:

- Background research
- Questionnaires sent to DE Mission members, WSC6 attendees, Decision Engineering Conference attendees and Industry
- Semi-structured interviews with real and virtual conference developers and WSC6 attendees
- The Structured Systems Analysis and Design Method (SSADM) Requirements Analysis

- Validation.

The research took a flexible design approach. The design developed and emerged during the data collection and early stages of the research due to these stages having no experimental variation of variables.

The research methodology was broken down into the following stages:

3.5.1. Background Research

The aim of this part of the research methodology was to identify how the project fitted into the Decision Engineering Mission objectives and to set the basis for the research activity.

The background research consisted of an extensive literature review of virtual communities, virtual education, virtual conference organisational and management, and virtual conference in the business environment. Also the research consisted of an extensive literature review in to requirements capture techniques and requirements capture best practice as presented in the previous Chapter 2.

An understanding of questionnaire design was also key to the success of the project.

Content analysis was done on all of the about sources of literature. This is an indirect quantitative analysis of what is contained in all the literature documents. This technique was used due to it having the following advantages:

- They are unobtrusive and non reactive
- They can provide valuable cross validation of other measures, either in support or disconfirmation of them
- They encourage ingenuity and creativity on the part of the enquirer.

Additionally observation techniques were employed. Participant observation was used were by the author participated in a live conference or an archived

conference. Also the author used unobtrusive observational techniques to observe people participating in an archived or live conference. The use of theses methods were due to the following advantages:

- It directness, you do not have to ask people there views or feelings
- Data can complement other techniques
- Seems to be pre-eminently the appropriate technique for getting at real life in the real world.

3.5.2. Questionnaires

A set of three self-completion questionnaires were designed and developed as part of the design methodology. The questionnaires were developed for three target samples, Decision Engineering Mission Members who consisted of Rolls Royce Plc, Corus Rail Technologies, BTExact, AcostE, Elbrus Technologies, and Cranfield University were key individuals were questioned. The 9th ISPE International Conference on Concurrent Engineering: Research and Application attendees of the 'Decision Engineering' workshops. The 6th Online World Conference on Soft Computing in Industrial Application attendees (WSC6). All questionnaires were developed on a common theme, which was to identify the user requirements that they required for Decision Engineering virtual conference. The questionnaires were then modified or extended depending on the sample. WSC6 virtual conference was used as a benchmark. The questionnaire then identified the issues of concern people had with the conference.

Questionnaires were used as the most appropriate technique due to the following advantages:

- Provide a relatively simple and straightforward approach to the study of attitudes, values, beliefs and motives,
- High amount of data standardization
- Low cost compared to other techniques
- Sample frame bias is low

3.5.3. Interviews

Semi-structured interviews were an additional part of the research methodology. The first interview was conducted face to face with a member of the Cranfield Universities Conference Centre development staff. The aim was to identify the processes undertake within a conference and to discuss their experiences with regard to management and participation issues. The second interviews were conducted over the phone with WSC6 participants. The aims of these interviews were the same as the questionnaires, but allowed for more discussion with regard to the issues they had with the WSC6 conference. Semi-structured interviews were used due to the study focusing on the meaning, and requirement of virtual conference to the participant, as well as the individual's perceptions with virtual conferences. Face to face interviews were chosen due to them offering the possibility of the interviewer to modify the line of enquiry, following up interesting responses and investigating underlying motives in a way that postal or other techniques can not do. Semi-structured interviews were chosen as the most appropriate technique due to the following:

- Control over question order good
- Use of open ended questions
- Very high response rate
- Response bias low
- Control of response situation good
- Quality of recorded response good.

3.5.4. SSADM Requirements Analysis

The use of the Structured Systems Analysis and Design Method (SSADM) was another key part of the research methodology. The aim was to develop a detailed requirement specification that would allow another researcher to prototype the virtual conference.

Analysis of the current environment was firstly undertaken (freeware discussion forum) and fully documented. The questionnaire results and interviews then

provided additional requirements, which were added to the current environment documentation to create the business solution option. Additionally this technique was chosen due to considering many different aspects of a project, functional and non-functional and it having a well defined structure.

3.5.5. Validation

There had been continual validation of the results, firstly the lifecycle models were validated by the Conference Development staff member. Member checking was used as a validation technique concerning the staff members. It involved returning the identified process model to be validated and to check for any bias the author may have contributed. Milestone results were presented to the client for validation. Weekly review meetings were undertaken with the project supervisors to identify progress and problem areas within the project.

3.5.6. AS: IS Model

An AS:IS virtual conference process model was identified through analysis of literature and through the analysis of WSC6 and current products on the market. The identified component processes identified from each of theses sources were then added together to create a current and accurate representation of the AS:IS process of a virtual conference. Semi-structured interview as previously mentioned, with a member of the Cranfield Conference Development team was conducted with the intention of identifying the processes that are involved in a real conference. This then resulted in a process that incorporated real conference process and additional process identified from literature, WSC6 and other virtual conference products.

3.5.7. Best Practice

The best practice research methodology was achieved by identifying strengths with existing virtual conference and the proposal of solutions to exciting problems which were identified in the semi-structured interviews and conducted questionnaire survey and by literature content analysis and participant observations. The

questionnaire survey identified issues people have with current virtual conference as outlined in chapter 5.

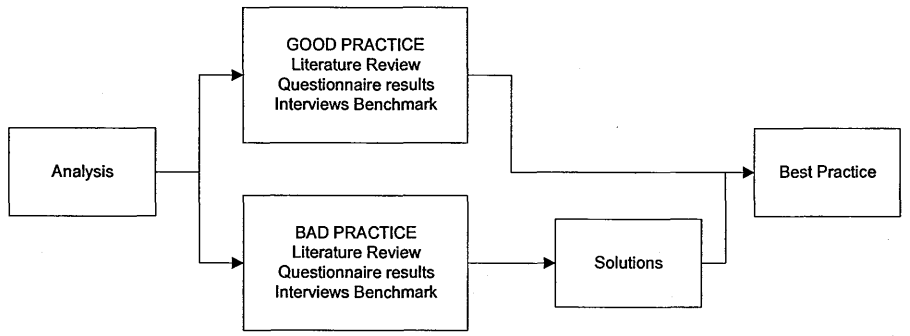


Figure 3: Best Practice Framework

3.5.7. Research Methodology Process

The following shows an outline of the research methodology process.

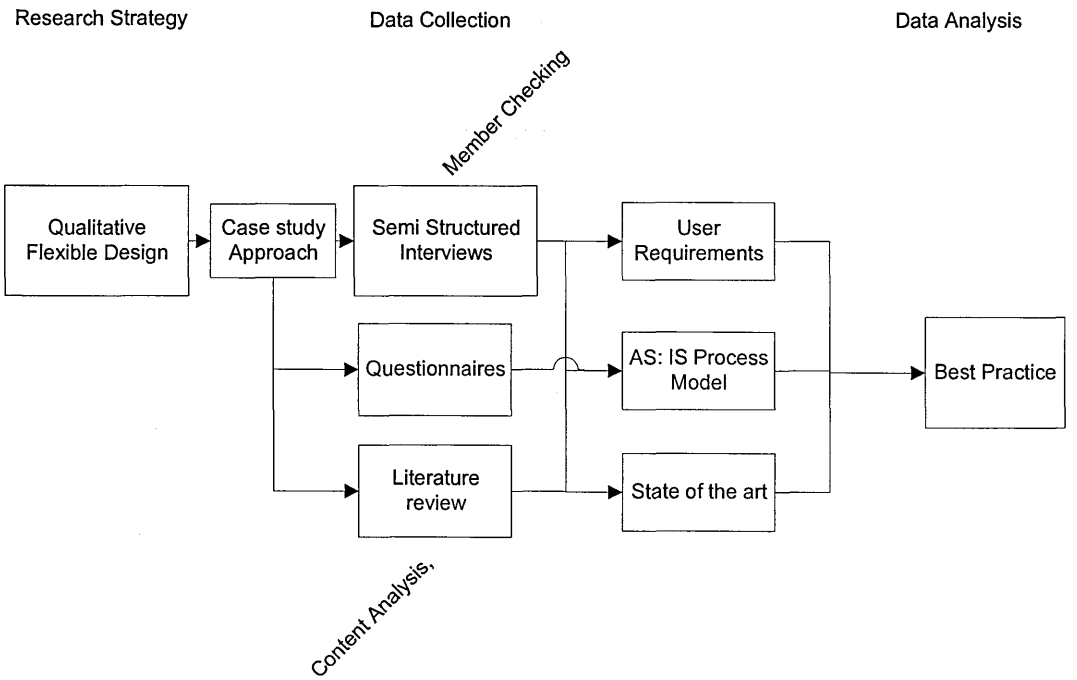


Figure 4: Research Methodology

3.6. Summary

In order to deliver best practice in virtual conference, in the high technology area this project has carried out an analysis of the user requirements for virtual

conference, an analysis of conference processes, and an analysis of state of the art.

A set of objectives and deliverables were then set. The research methodology was designed to achieve the objectives and deliverables. The research methodology consisted of:

- Background research
- Questionnaires sent to DE Mission members, WSC6 attendees, Decision Engineering Conference attendees and Industry
- Semi-structured interviews with real and virtual conference developers and WSC6 attendees
- The Structured Systems Analysis and Design Method (SSADM) Requirements Analysis
- Validation.

Now that the project objectives and methodology have been set the next chapter will present the finding and result for Virtual Conference AS:IS.

CHAPTER 4 – VIRTUAL CONFERENCE: AS-IS

This chapter will present the findings and results that are concerned with the user groups, processes and the state of the art in virtual conference.

4.1. Methodology

The objective of, developing lifecycle models of conference processes and to identify state of the art in virtual conference was achieved by the use of, an extensive analysis of literature, the analysis of current products on the market and semi-structured interviews of Cranfield Universities Conference Centre development staff. The 6th Online World Conference on Soft Computing in Industrial Application was also used as a benchmark virtual conference.

4.2. Real and Virtual Conference Definition

'Real' conferences are the gathering of individuals at a location with the intention of sharing ideas through lectures, interactive workshops, tutorial and keynote speech's. They are also areas in which individuals discuss ideas and network with one another.

Virtual conferences on the other hand are the gathering of people on the Internet for a variety of purposes from formal meetings to information exchange, to ideas generation and social exchange.

4.3. Conference User Group

The following section will present the identified user groups through extensive analysis, concerned with a real and virtual conference.

4.3.1. Real Conference User Group

Through the previously mentioned methodology the conference user groups were identified.

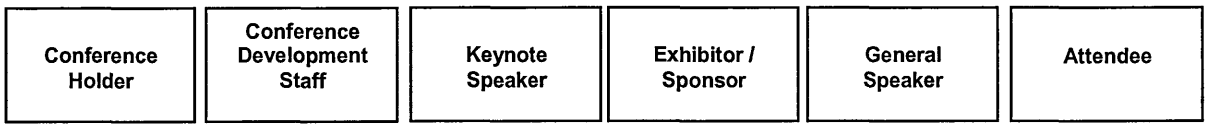


Figure 5: Real Conference User Groups

The conference holder is an Enterprise or person(s) that had initiated the request of holding a conference. The conference development teams are an internal or external Enterprise or person(s) that organise and develop the conference, while meeting the required objectives from the conference holder. Exhibition and Sponsors are external organisations that would be allocated space within the conference to exhibit their products or services. Conference contains two types of speakers. The keynote speakers usually will present a speech at the opening or closing of the conference. General speakers are people who present their research in workshops, lectures and tutorials. And lastly the attendees are as their name suggests the attendees of the conference.

4.3.2. Virtual Conference User Group

The user groups in a virtual conference can be seen to be slightly different due to the medium to which the conference is delivered, via the World Wide Web. The user groups consist of the following:

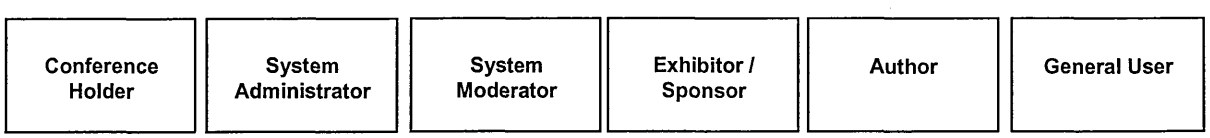


Figure 6: Virtual Conference User Groups

The conference holder is the same as in the real conference. They are an Enterprise or person(s) that has initiated the request of holding a conference. The Conference Holder can also be the location to which the conference is being held,

for example it may be an Internet Service Provider, or a location on an organisation's server.

The System Administrator has total control over the conference and will deal with all activities that are pre conference going live. The System Moderator deals with all activities during the conference. The Authors are the individuals who submit the content of the conference in the form of papers and presentation materials. The general users are the attendees of the virtual conference and are the target audience for the conference holder.

4.4. Conference Process

The aim of identifying the process within a real conference was that the process would be implemented into a virtual environment, namely the Internet. The ideas behind this were that the user would then interact with the environment, in as near as possible way, using the same methods and procedures as they would when attending a real conference. This 'near as possible' environment would then be achieved by the user following the same processes in the virtual environment as they would in the real environment.

4.4.1. Methodology

The AS:IS virtual conference process overview model shown in Figure 6 was identified through analysis of literature and through the analysis of WSC6 and current products on the market. The identified component processes identified from each of theses sources were then added together to create a current and accurate representation of the AS:IS process of a virtual conference. A semi-stuctured interview with a member of the Cranfield Conference Development team was conducted with the intention of identifying the processes that are involved in a real conference. This then resulted in a process that incorporated real conference process and additional process identified from literature, WSC6 and other products. Addition identified processes can be seen in Appendix C.

The conference process consisted of three key areas:

- Organisation
- Participation
- Follow up.

The three areas can be seen in Figure 5, organisation section A, participation section B and finally follow up section C.

These three areas are broken down as follows: Section A. the organisation activities would consist of advertising, creating interest and the identification of the key individuals within the conference topic area. There would be then a call for papers. The call for papers would be targeted at the key individuals related to the conference topic area. The key individual would be speakers and lecturers on the topics of interests. Once an abstract of the submitted papers has been identified as being acceptable to present in the conference, copyright forms would be sent out for the authors to complete. If the papers were unacceptable then notification would be sent to the author. The conference site would then begin to be designed and the authors would submit their final full papers and presentation materials.

At this point participants would be targeted with the intention of pre-registration.

In Section B registration would consist of the reviewing of the schedule should you have pre-registered and choosing areas on interest to participate in. You then attend the conference, register if not previously registered and attend a welcome meeting.

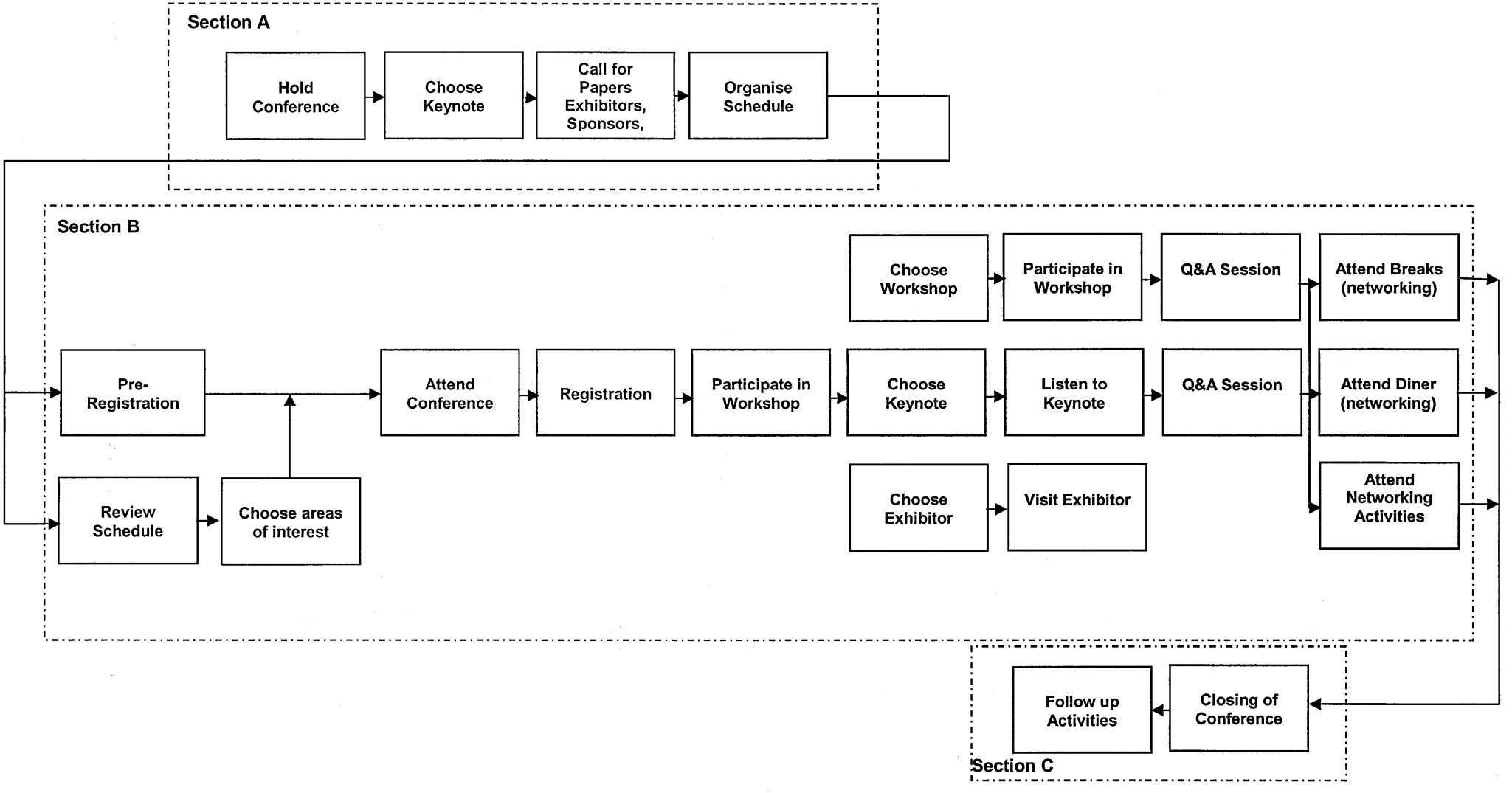


Figure 5: Conference Process Overview

The next stage 'participation' consists of the choice of workshops, keynotes and exhibitors. The choice of areas of interest would then be attended. There would then be a question and answer section to air views or issues to do with the topic of interest. This activity would involve the choosing of a session to participate in then contributing comments and questions to the session through a text based message board. Then you would return to the message board to see if there is a reply to the previously posted message.

Section C consisting of the 'follow up activities' which is concerned with post-conference. These activities consist of lead management, improvement and attendee feedback, also the publication of proceedings.
IDEF0 models of the virtual conference process can be seen in appendix D of this thesis.

4.4.2. Validation

The identified conference process was validated through an interview with a member of the Cranfield Conference Development Staff.

4.5. Virtual Conference Representation

A real conference is held, usually in a conference centre. The conference would consist of many different rooms that contained different workshops or lectures.
The representation from real to virtual could be achieved by designing the site as follows, Hand, C. (1994):

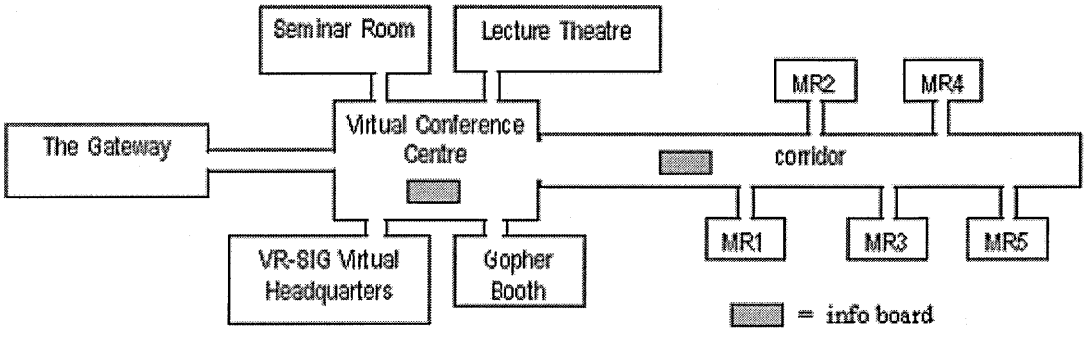


Figure 6: Conference Virtual Representation

4.6. Virtual Conference Features

It has been identified that there are two types of virtual conference, asynchronous and synchronous. Synchronous is concerned with real time communication. Synchronous conferencing requires participants to be on-line at the same time in order to participate. Where as asynchronous the participants can be online at different times and in different locations. Postings by the asynchronous conference participants are read and responses sent at different times. Asynchronous conferencing is able to link geographically distant participants and enable them to participate when they are able. Synchronous virtual conference can be seen to be the 'state of the art' out of the two.

4.6.1. Synchronous Virtual Conference

Synchronous virtual conference can be seen to be state of the art over its counter part asynchronous. This type of conference incorporates many technologies to improve and extend the conference experience.

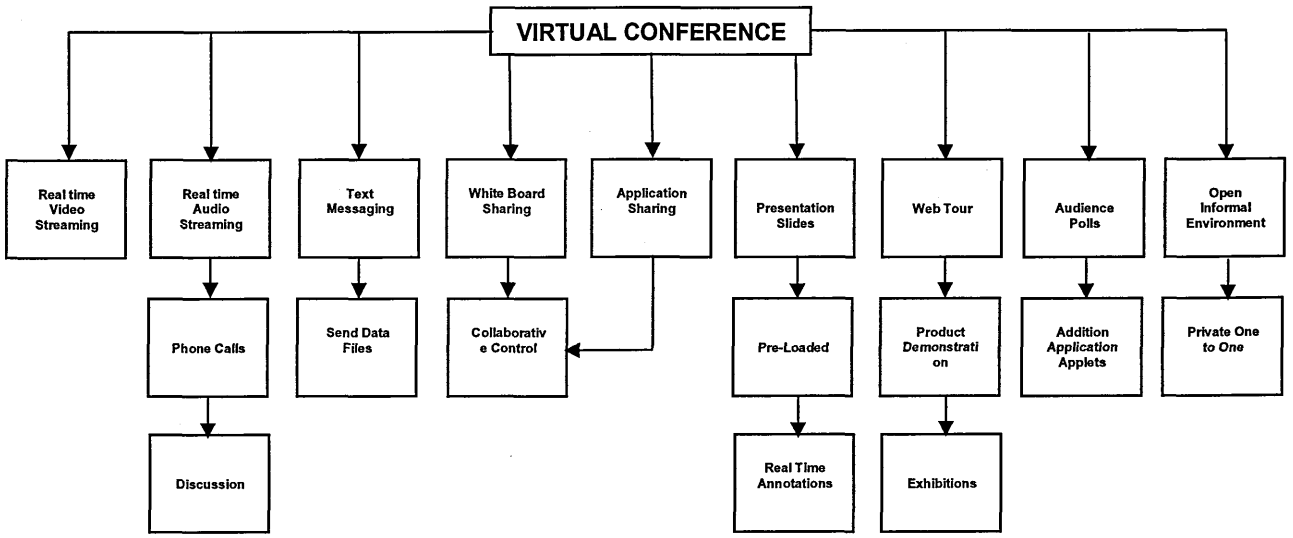


Figure 7: Synchronous Conference Features

Features incorporated in a synchronous virtual conference include video and audio steaming. The presenter of the workshop or lecture would present their material to a global audience through the use of video in real-time. Participants also have an additional benefit of being able to listen to the lectures live and phone in to the conference for live discussion or question and answer sessions.

Real time text messaging 'IRC' is another feature of synchronous conferencing. This allows for the participant of the conference to communicate through the use of text. This tool also allows for the sharing of data files between the on-line participants.

White board and application sharing are features that allow for the users to share a common application. The application or white board allows for collaborative control by the users in the virtual environment.

Presentation slides can be incorporated into a synchronous virtual conference and allow for real time annotation.

Exhibition areas can be an important feature of virtual conference and can incorporate web tours. The web tours can allow for an interactive demonstration of the exhibiting companies' products or services.
The exhibition area can be an addition means of income should the exhibitor be charged for they're exhibiting space within the conference.

Synchronous conference also allows for audience polls, which can be done through applets. These polls can add to the user interaction experience and can identify valuable data about the participants, depending on the poll questions.

An open informal environment can also be a feature of synchronous virtual conference, which allows the participants to have private one to one discussions; this is an ideal environment for networking.

4.6.2. Asynchronous Virtual Conference

Asynchronous virtual conferences are conferences that have no on-line user interaction. The technologies used in an asynchronous conference can be very similar to that of a synchronous except that the synchronous conference will have archived content. The features are as follows:

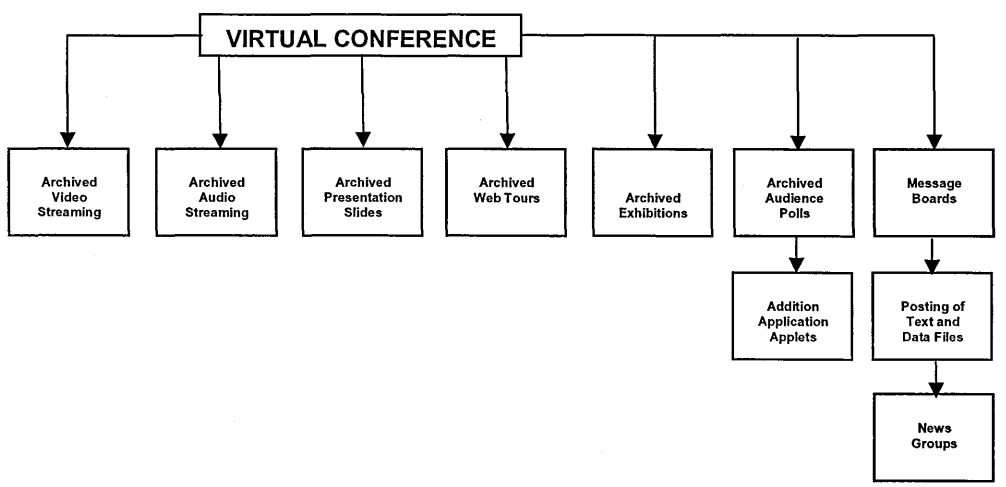


Figure 8: Asynchronous Conference Features

An asynchronous conference can contain video and audio as its content but this would be in an archived format that would be located on a server and accessed by the client on request any time any place. The speed and quality of the video or audio is dependant on the users Internet connection bandwidth.

Presentation slides, web tours, exhibitions and audience polls can all be features within an asynchronous conference but they would also be in an archived format. The main feature for interaction, discussion and networking within an asynchronous virtual conference is a message board.

The message board is an environment, were text messages can be posted and read by any user of the conference. In the context of the virtual conference this message board is, were users will post the views on presented papers that are of interest to them. This represents the question and answer sessions of a real conference.

It should also be mentioned that once a synchronous conference has finished if the content is recorded and archived it could then become a asynchronous conference. The content would be then viewed on demand.

4.7. Synchronous Vs Asynchronous Conference

Depending on the objectives of the conference depends which is the most appropriate method of holding a virtual conference.

Synchronous Conference	
Strengths	**Weaknesses**
Real time interaction. Heightened interaction experience. Closer representation of real life.	Time zone issues. High bandwidth connection required. High preparation effort. Complex organisation effort. Limited to use during single period of time.

Table 1: Synchronous Conference Strengths and Weaknesses

Synchronous virtual conference will take a considerable effort in the organisation, even more so than in a real conference.

Asynchronous Conference	
Strengths	**Weaknesses**
Good for technical discussion (gives the recipient time to consider rely) Any time any place Lower preparation effort Lower organisational effort Not limited to active time	No real-time interaction Time of message rely unknown

Table 2: Asynchronous Conference Strengths and Weaknesses

The United States Conference on Catholic Bishops is an example of a synchronous conference that uses real-time video broadcasting. The site has been designed so that once the synchronous conference has ended the content has been incorporated in to synchronous format. Another example can be seen at the Rural Heath Conference 2002. An example synchronous conference can be seen at the AID2002 conference.
(http://www.atlanticvideo.com/clients/ccom/).
(http://www.abc.net.au/rural/worldhealth/video.htm)
(www.aid2002.com)

4.9. Summary

This chapter has presented the first objective virtual conference AS:IS. It has presented the conference user groups the conference process and asynchronous and synchronous conference features, through the analysis of literature, semi-structured interviews and the analysis of WSC6. It has also presented asynchronous vs. synchronous conferencing. The next chapter will present objective 2 user requirements results and findings.

CHAPTER 5 – USER REQUIRMENT CAPTURE (SSADM)

This chapter will present user requirements identified for the use of virtual conference in a high technology area, namely the Decision Engineering Mission.

5.1. Methodology

The objectives of identifying user requirements was achieved by the use of questionnaires that were targeted at Decision Engineering Mission Members, the analysis of literature and the use of the 6th Online World Conference on Soft Computing in Industrial Application (WSC6) virtual conference as a benchmark. An additional questionnaire was targeted at WSC6 attendees with the aim of identifying requirement and issues with the participation of virtual conference.

5.2. Decision Engineering Mission Members (DEMM)

In total the Decision Engineering Mission Members consisted of eight persons ranging from organisations such as Corus Rail Technologies, Elbrus Technologies, Cranfield University, Rolls Royce, AcostE and BTExact.

A questionnaire was targeted at the Decision Engineering Mission Members with the intention of identifying what it is they require when participating within a virtual conference.

The questionnaire targeted at the Decision Engineering Mission Members identified what features the DEMM would like to have when participating in a synchronous virtual conference and the features required when participating in an asynchronous virtual conference. Other identified areas from the questionnaire were the goals the DEMM had with participating in the DEM and a conference on DE. Also other questions identified how the DEMM would view the conference a failure. Additional questions were asked concerning if the DEMM would be willing

to answer none specific questions to the mission and if they would be willing to be a moderator for the conference when it went live.

Finally the DEMM, being from leading UK businesses, were used as an indication of whether virtual conferencing was used as a tool in industry. The results from the questionnaire indicate is that asynchronous virtual conference is not used as a tool in industry.

5.2.1. Decision Engineering Mission Member Goals

It was identified that the Decision Engineering Mission members had a range of objectives for participating within the Decision Engineering Mission. They are as follows:

- To learn more about Russian IT sector and Aerospace
- Networking with Industry base of Russia
- To develop relations with the technology transfer department of the DTI
- Investigate the possibility of collaboration with Russian companies
- Assess opportunities for technology transfer in UK railways
- Learn more about the process of preparing for and arranging a mission.

These entire objectives coincided with the main objectives of the Decision Engineering mission which were to:

- Identify the level of technologies used in Decision Engineering within Russian aerospace, transport and oil and gas sectors
- To understand the business model of co-operation between UK and Russian Companies and academic institutions for future financial benefits
- To improve the competitiveness of UK industry by making it more aware of development in management of best practise in Decision Engineering in the Russian federation.

Alongside the objectives of the DEMM, the primary goals of participating within a virtual conference were also identified. They are as follows:

- To identify a way forward for the dissemination of results from the DE mission
- Networking in the Industry and research base of UK
- Networking with Russian Companies interested in DE technologies
- Understand more about mutual working models
- Provide advice to UK companies wishing to interact with Russian companies
- Develop links with Russian companies' associated with railway technologies
- Increase awareness of member companies.

Addition information was identified in the questionnaires, such as how they would class a virtual conference a success. The results are as follows:

- Positive feedback from participants
- Suggestions on the way forward about Decision Engineering in Industry
- The discussion develops a focus.

Recommendation

Having considered the goals and success indicators from the Decision Engineering Mission Members, recommended solutions were developed with the aim of achieving the DEMM goals, within the context of a virtual conference. The solutions can be related to the relevant goal or success indicated as shown in Appendix D of this thesis.

The chosen solutions are as follows:

- Site links to Decision Engineering and information participating company information
- Show contact details of industry research base of DEMM
- Use topics and subtopic to create a focus

- Use lead management mechanisms within the site
- Create an area of the conference that can be used for one to one contact
- Links to AcostE site.

In addition to identifying the goals of the mission members, failures and problems were identified from WSC6 attendees.

5.2.2. Issues with Virtual Conference

The following will list the problems with Virtual Conference identified through the analysis of the questionnaire results.

- Attendance very low
- No novel discussion
- Negative suggestions about the virtual conference and environment
- Discussion does not develop a focus and maintain that lively focus
- Vague and high level objectives
- Information generated during discussion can not be used for a purpose at a later stage
- Participants do not view the conference to be of value
- Participants participating in the conference rather than logging on to down load the papers
- Organisers do not send copies of the proceedings.

Recommendations

These issues can be overcome by the following recommendations and should be incorporated and considered when developing a virtual conference.

- Have incentives such as free proceedings to encourage participation, or non-profit.

- The moderator's role must incorporate the activity of removing any negative comments, and if the attendance is low must contribute to the postings
- The moderator would add positive feedback within the posting
- Moderator will email relevant people to participate when a posting has been posted in their registered topic of interest
- Moderator must be committed to the conference during its active period. Set an amount of time to contribute to the conference
- Send reminder emails to keep participation
- Have a ranking system, the more a participant contributes to the discussion the higher in the ranking they become. Allows the participant to engage in personal achievement
- Link paper downloads to the discussion forum
- Participants can only down load addition papers if they have contributed to the discussion
- Restrict access to people who do not contribute to the discussion.
- If people are interested in the topic this will lead to natural participation.

Appendix D contains a table used as an aid in the identification of the above mentioned solutions.

The questionnaire also identified other requirements with regard to the DE participating in the conference.

The main feature of a conference is that it is capable of containing papers and presentation materials for which the user can access and read and discuss. To allow the virtual conference to do this requires that the data to which will be uploaded, be identified. Figure 8 indicates the required file formats, which are to be uploaded.

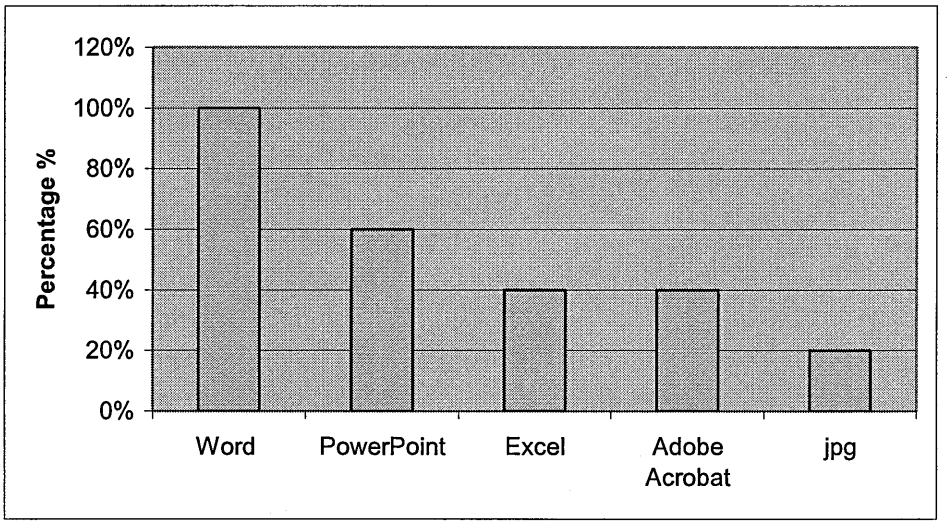


Figure 9: DEMM Requested Upload File Formats

The questionnaire identified what feature requirements the Decision Engineering mission members required in the context of asynchronous virtual conference. Figure 10 below indicates the results.

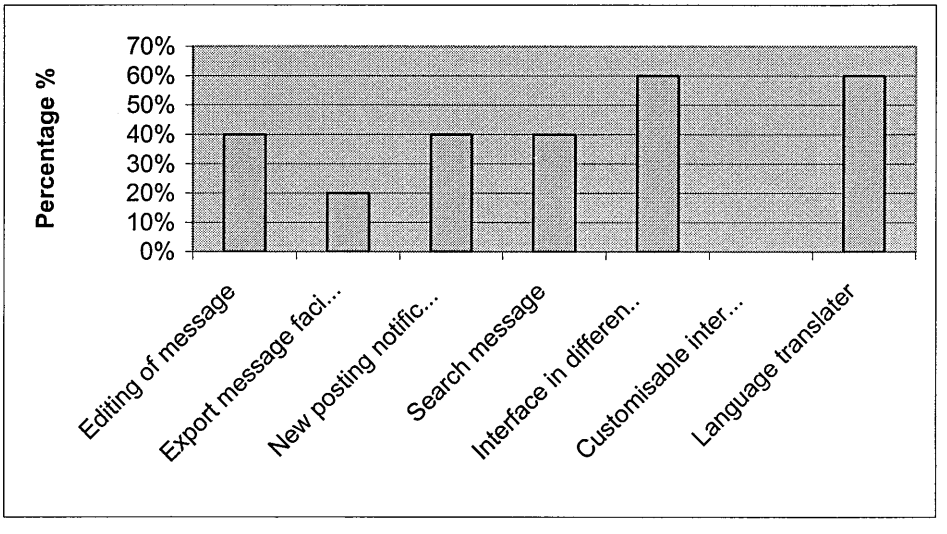


Figure 10: Requested Asynchronous Conference Features

The results indicate that the automation of interface in different language, namely Russian and a feature of a language translator was of most importance to the DE Mission Members.

Feature Requirements for asynchronous conferencing were also identified. The results are shown in figure 11.

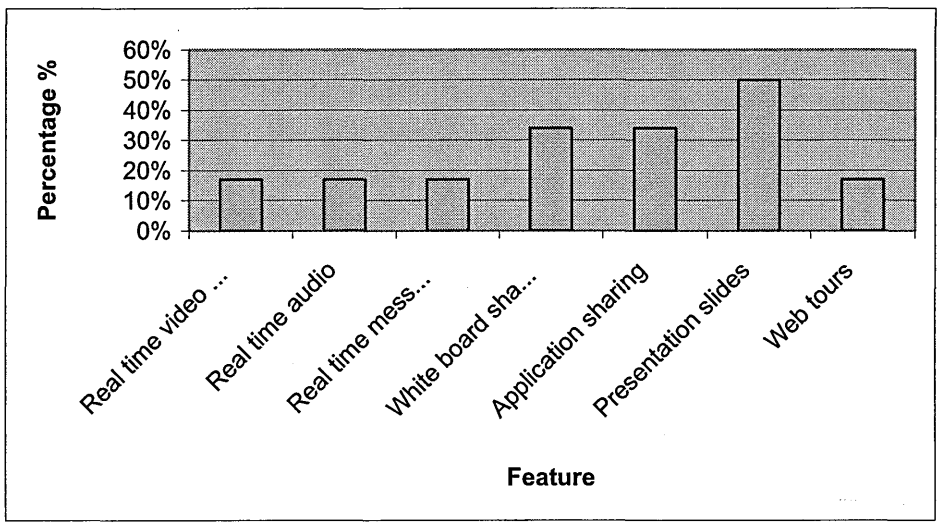


Figure 11: Requested Asynchronous Conference Features

Figure 10 indicates that the use of presentation slides with real time annotation was of most importance, with application and whiteboard sharing features second in importance.

5.3. User Requirement Capture using The Structured Analysis and Design Method (SSADM).

The decision to use SSADM for the analysis and development of a software requirements specification was chosen due to SSADM considering many different aspects of a project, functional and non functional, and that it has a well defined structure, compared to other system development methodologies.

This project was concerned with Module 1 and 2 of SSADM. Module 1 the Requirements Analysis Module and Module 2 the Requirements Specification.

Once these modules were successfully completed the Requirements Specification was passed to another researcher who would use the documentation to develop a working prototype virtual conference. The full documentation can be seen in Appendix A.

5.3.1. Discussion Forum Analysis

One of SSADMs first stages is to identify and analysis the current system. In the case of this project analysis was undertaken of a freeware discussion forum.
The SSADM procedure was fully followed and a resulting set of Data flow and logical data flow diagrams were developed. For a more in-depth explanation please see Chapter 1.

The literature review, questionnaires and identification of conference AS:IS had identified addition requirements that were to be incorporated into the data and logical data diagrams and addition documentation. Also using the WSC6 as a benchmark identified addition requirements.

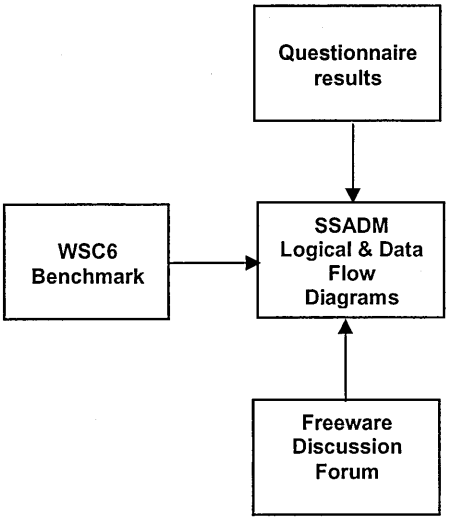


Figure 12: SSADM Analysed Components

Figure 12 shows the identified and analysed components that were incorporated together to give virtual conference.

5.3.2. WSC6 Identified Requirements

WSC6 was used as a benchmark virtual conference. It was used as a starting point. The identified requirements were then added to the SSADM documentation, and the associated diagrams extended.

5.3.3. Questionnaire Survey

The questionnaire survey aimed at WSC6 participants and the DEMM identified how the virtual conference would be seen to be a failure. Solutions to the identified issues of participation within virtual conference where then incorporated to give the final SSADM results. These have been presented in Chapter 5.

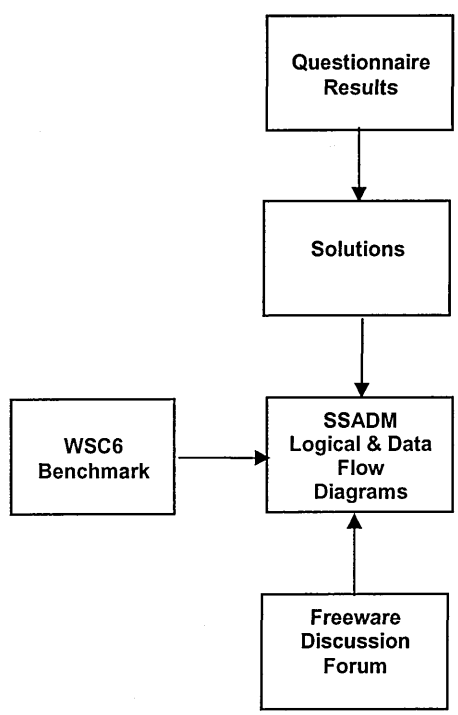


Figure 13: Component Framework for the Development of SSADM Documentation

Figure 13 shows the developed framework that was used to identify all requirements for virtual conference.

5.4. SSADM Results

The end result for the user requirements capture objective was a SSADM Requirements Specification Document. Figures 14 -19 show the stages of development and resulting data flow and logical data flow diagrams concerned with the requirements analysis stage of SSADM. The stages of development consisted of firstly identifying the current system, in the case of this project, the discussion forum. The resulting Data Flow Diagrams can be seen in Figure 16. The data flow diagrams describe the data that flows around the system, the entities of the system (the ellipse shape) e.g. a user or moderator and the processes that happen within the system by either the system itself or an entity. As addition requirements were being identified from analysis of literature and WSC6 and questionnaires they were incorporated in to the data flow diagrams. Lower levels of top-level processes can be seen in Figures 17 and 18. Additional to the analysis of the data flows, data stores were identified and processes were associated to the relevant data store as shown in Figure 17. The end result being the best option in meeting the objectives is then presented as the Business Option Data Flow Diagram as seen in Figure 14. Once the requirement analysis had been identified and documented as data flow diagrams, the next stage is adding the addition requirements to create the full requirement specification, which can be seen in Appendix A.

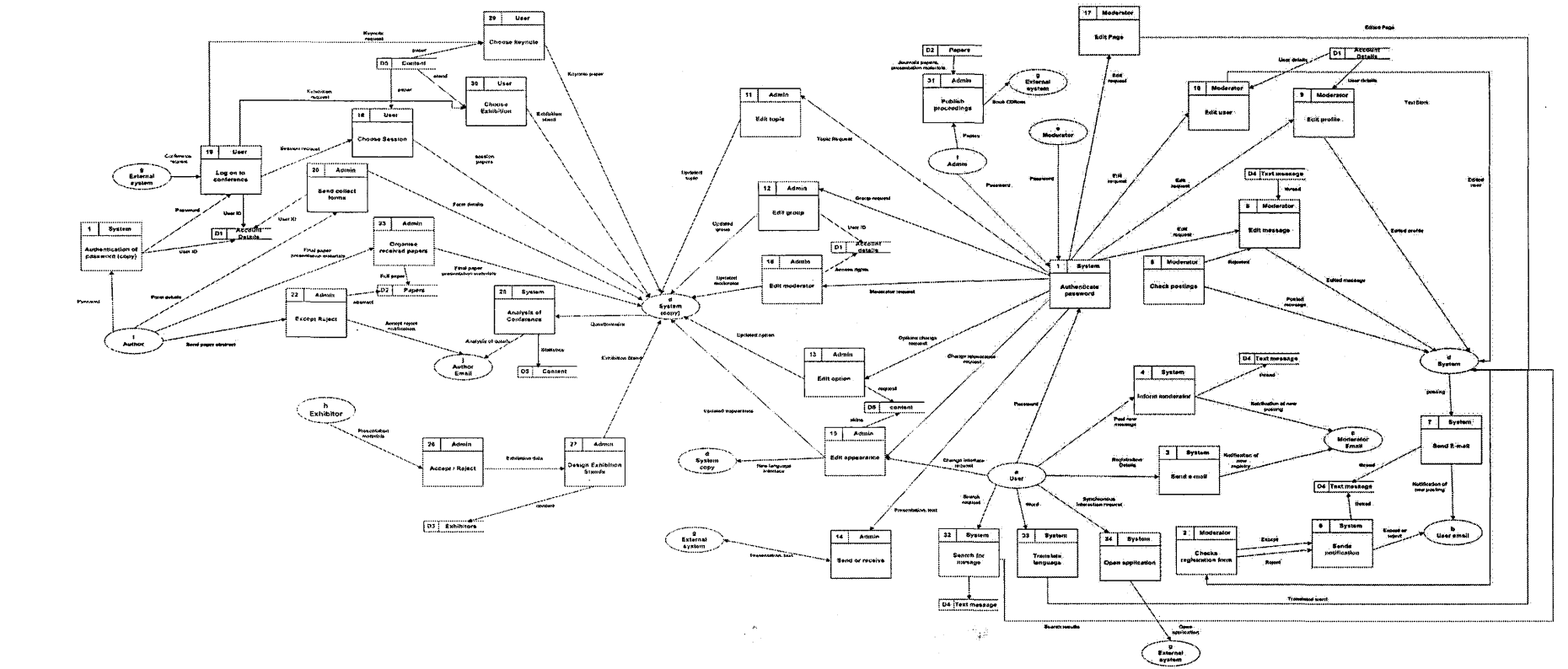


Figure 14: Business Option Logical Data Flow Diagram

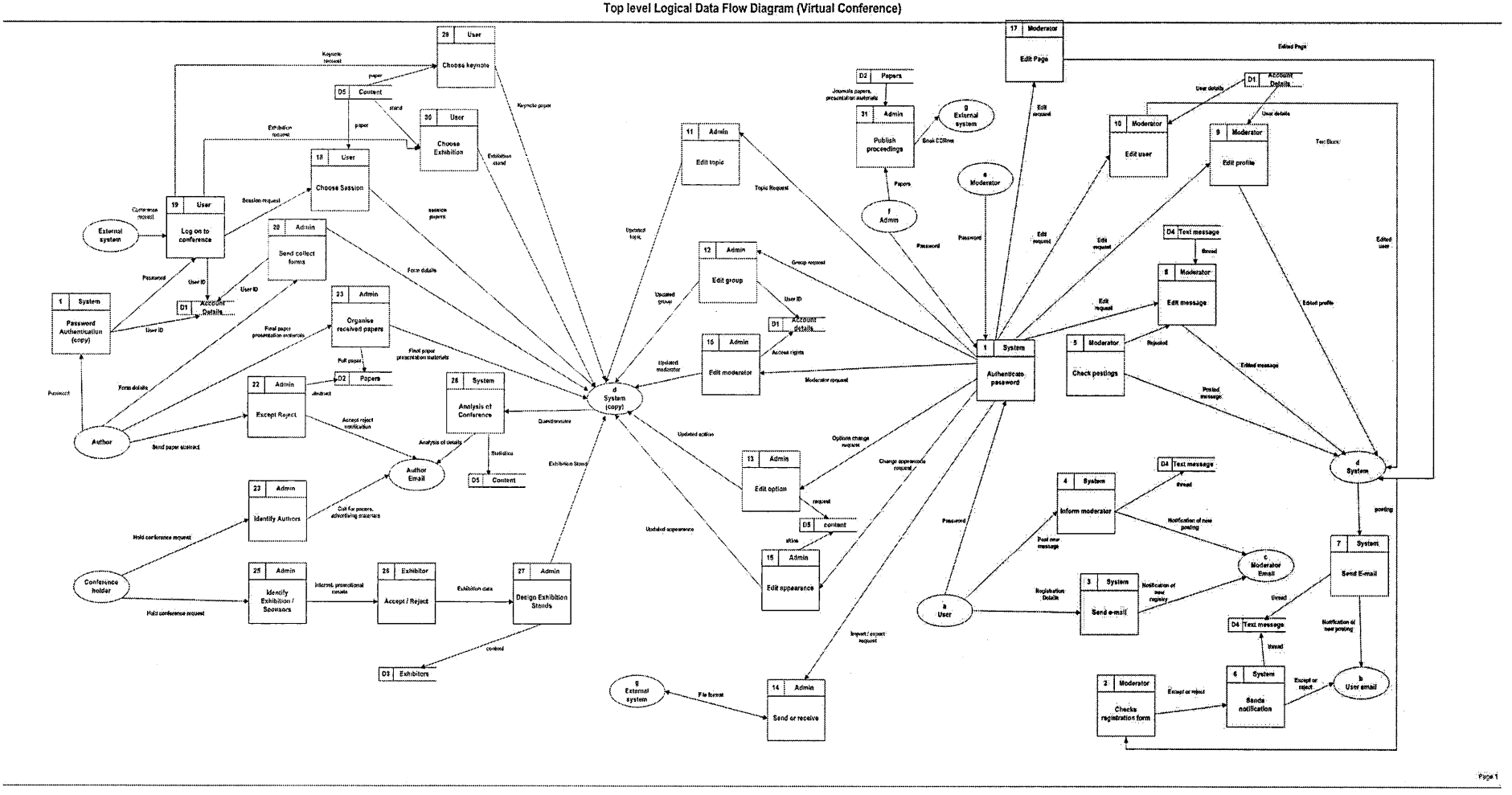


Figure 15: Logical Data Flow Diagram

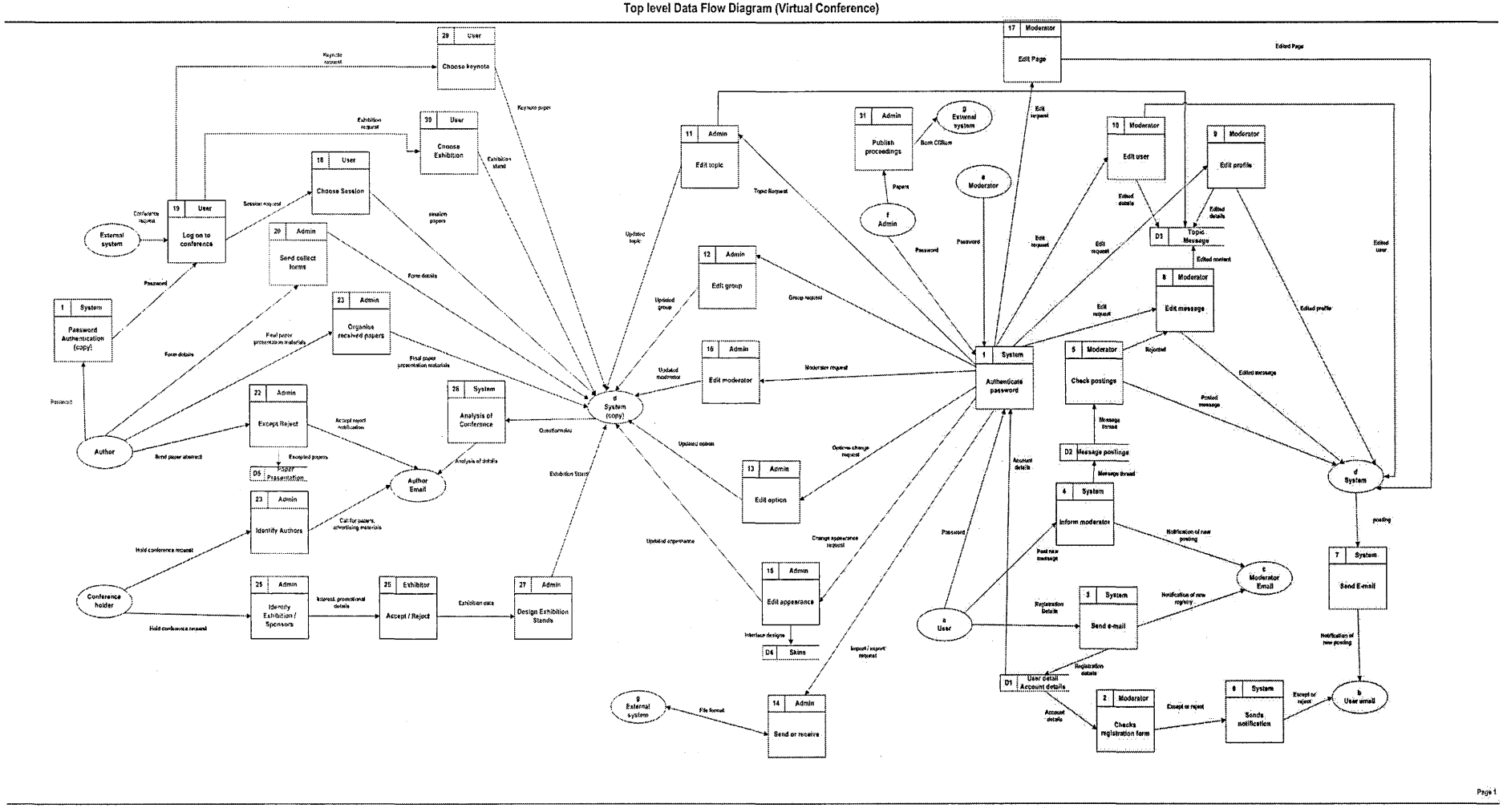


Figure 16: Data Flow Diagrams

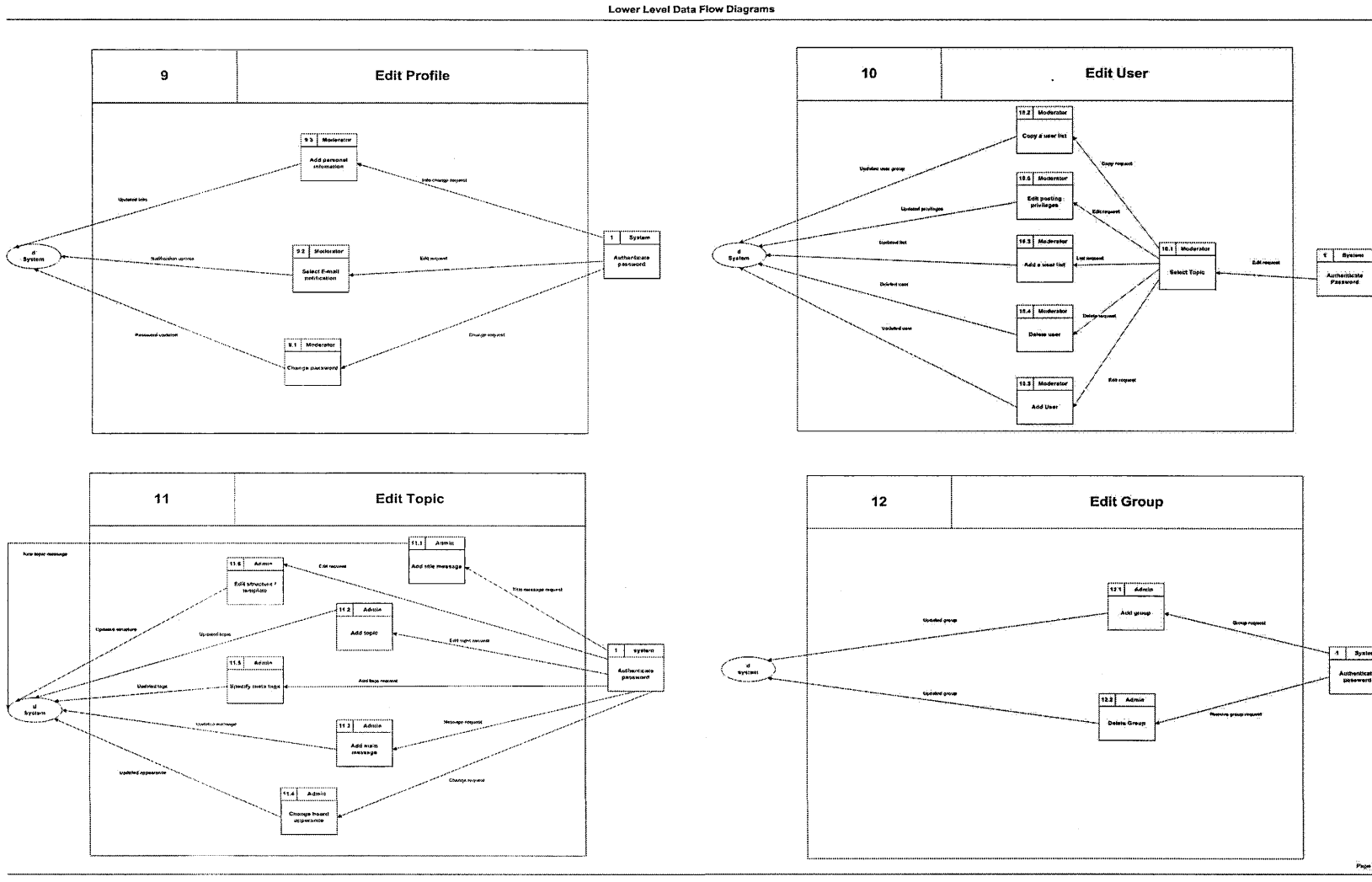


Figure 17: Lover Level Data Flow Diagram

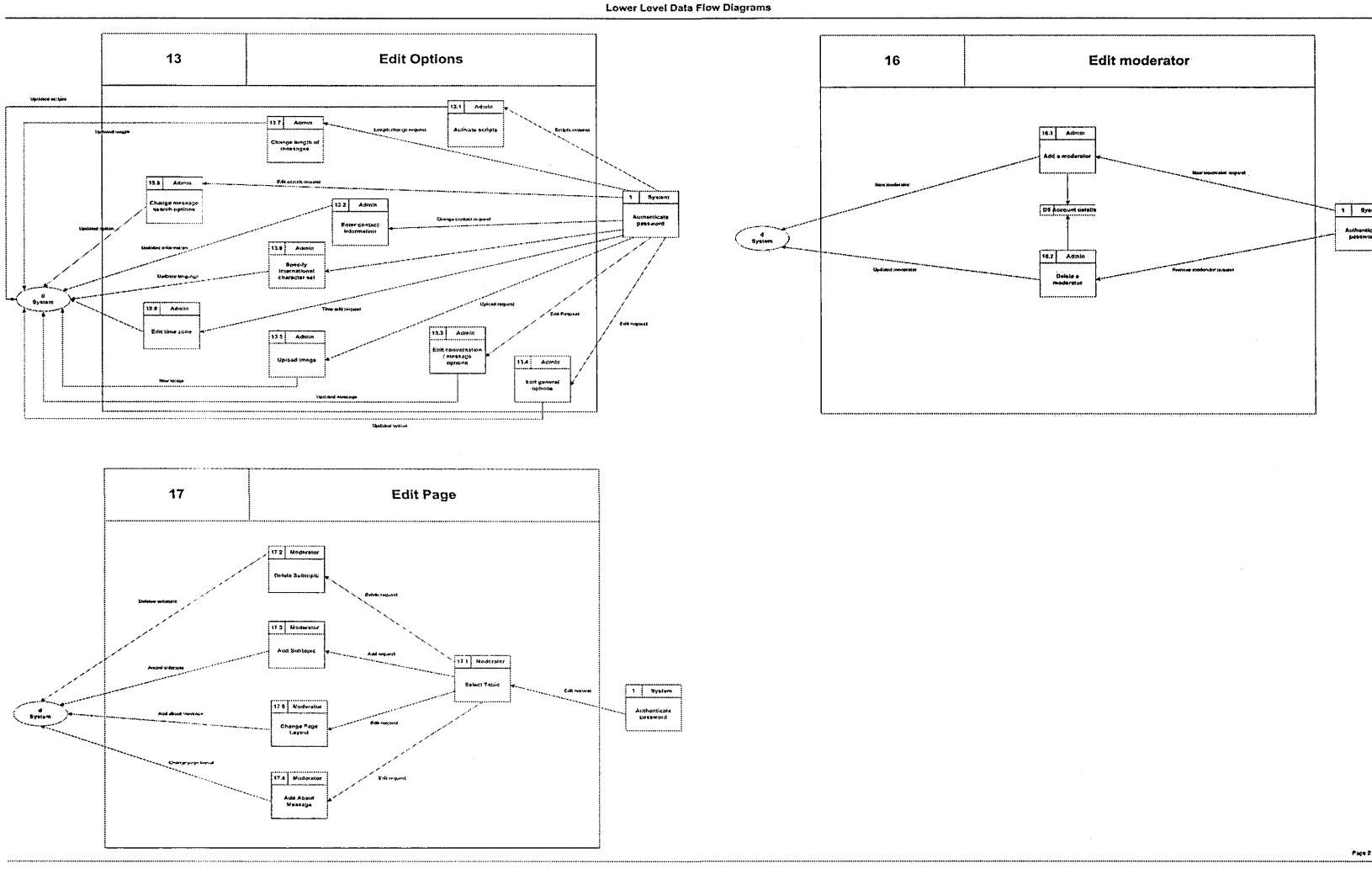


Figure 18: Lover Level Data Flow Diagram

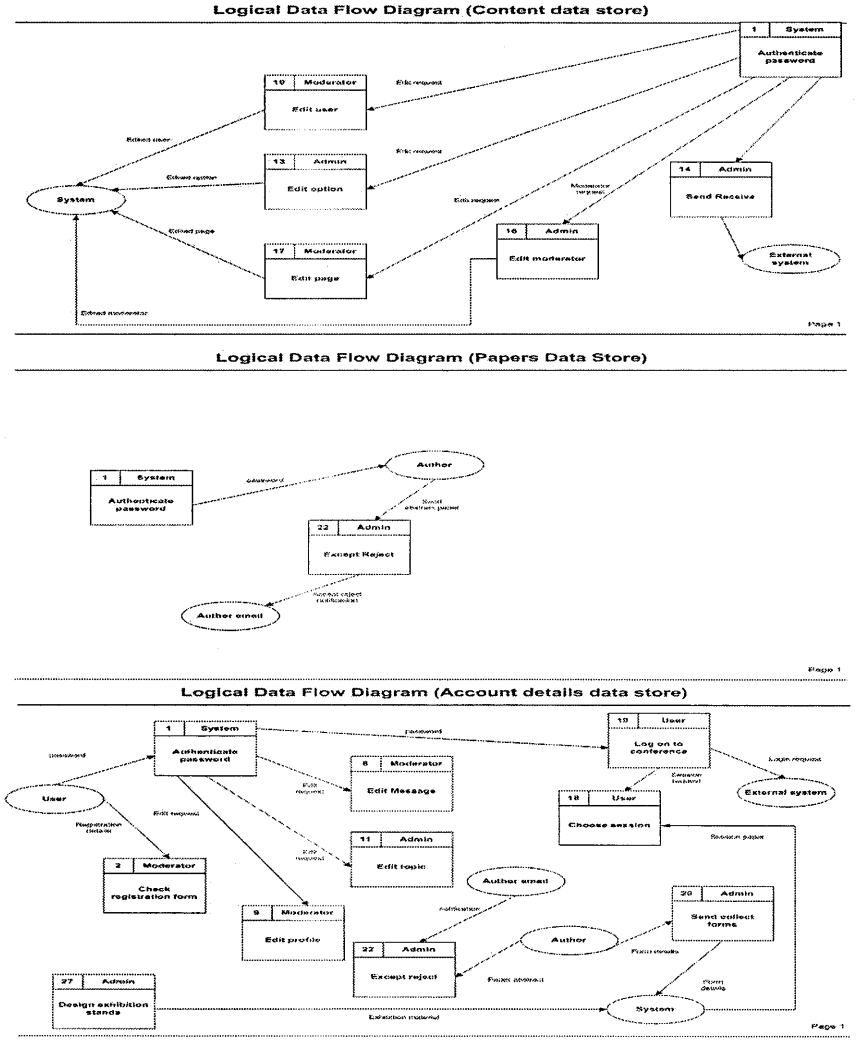


Figure 19: Data Store / Logical Data Flow Diagram

5.5. Summary

This chapter has presented the user requirements that were identified by the Decision Engineering Mission Members as of important when participating in a virtual conference on Decision Engineering. It has presented the methodology that was used to obtain the requirements. This chapter has also presented recommendations to issues and problems that have been identified through the extensive literature and questionnaire survey.

The results to virtual conference AS:IS and user requirements have now been presented. Therefore the third and final objective will be presented, 'Best Practice in Virtual Conference'.

CHAPTER 6 – BEST PRACTICE OF VIRTUAL CONFERENCE

This chapter will present the identified best practice for virtual conference. The findings have been grouped into key activity areas and will be presented through the following sections, Planning, Promotion, Preparation, Production, Post Event.

This section will also include a "virtual conference best practise management checklist" that should be followed when developing a virtual conference.

6.1. Methodology

The objectives of identifying strengths with existing virtual conference and the proposal of solutions to exciting problems was achieved through the extensive literature review and conducted questionnaire survey. The questionnaire survey identified issues people have with current virtual conference as outlined in chapter 5.

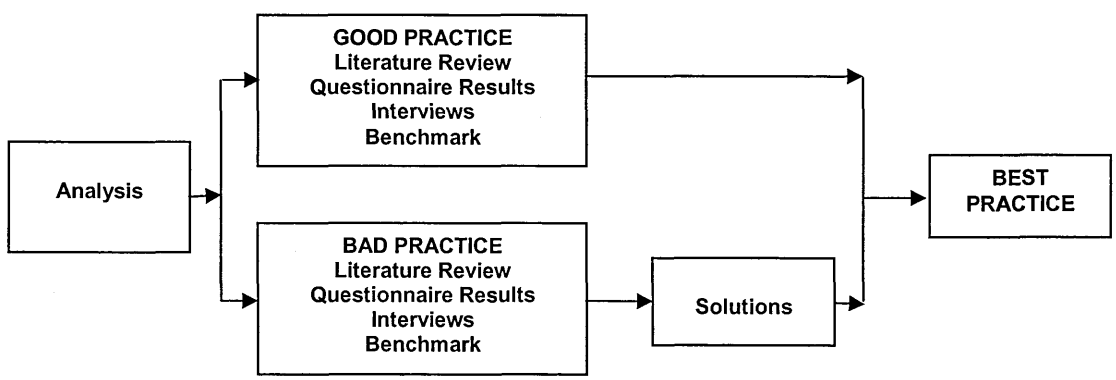


Figure 20: Best Practice Framework

6.2. Planning

This section will describe the identified best practice in the planning activity of virtual conference.

6.2.1. Synchronous or Asynchronous

It has been identified in Chapter 4 that there are two types of virtual conference, asynchronous and synchronous.

Depending on you conference objectives greatly depends on which is the most appropriate to us in the designing and running of the conference.

It has been identified that for geographically dispersed audiences and discussion of a highly technical nature, asynchronous conference is the most appropriate. Since communication is asynchronous, participants can take their time ordering and composing their thoughts.

Synchronous conferencing requires every participant to be online at the same time. These raise issues of time zones, one participant may need to be online at for example, 04.00am to participate. Synchronous conference allows for the participant to participate anytime anywhere. On-Line Conferencing White Paper,(2001).

6.2.2. Virtual Conference Objectives

To start the planning of the virtual conference it has been identified that you should answer the following questions:

- What are the objectives of the conference?
- Why are you holding this conference?
- What do you want to gain from this conference?
    - Is it for information sharing or idea generation?
    - Are you trying to expand the knowledge base in your workplace?
    - Are you exchanging views about an issue?
    - Are you attempting to enlarge a network of colleagues?
    - Are you promoting constructive debate?
    - Are you intending to develop a virtual community that shares your organisation's mission?

- Are you developing a public virtual space for citizens to voice their concern?

These objectives need to be communicated to the participants to guide their participation, and should be broken down in to various subsets so that they can be readily quantified as goals. On-Line Conferencing White Paper,(2001).
This stage is also were the topic of the conference is clearly identified. The topic will aid the identification of the target authors and participants. ConferZone White Paper, (2000).

6.2.3. Authors and Participants

Participants and authors are the main contributors to the success of the conference. The objectives should be the guide to identifying the target groups. List acquisitions of potential participants and authors should be identified. On-Line Conferencing White Paper,(2001).

The authors have to be experts and peers in their chosen area, this aids in obtaining participants due to the, social need to interact with the peer group which is as strong a motivation for participation as the technical content. A decision also needs to be made on the format of the presentation material and notified to the authors.

Author Submission

Submission of papers from authors should be in the form of PDF or PostScript version plus any addition presentation content as html. This allows for a printable version for participants and eliminates macro virus if .doc files are used. Also the addition benefit of using PDF is that it can not be easily edited.

If pictures are to be submitted as part of the presentation material, then there must be clear instructions to do so or that when uploading there must be a mechanism that allows for picture not to be forgotten. The mechanism should

show a checklist that should be completed by the author before the submission allowing everything that should be submitted, to be submitted.
There must be only one mechanism to allow for the uploading content.

Papers should be asked for in one folder named after the paper number, for example "paper001". This folder would include the index page of the web presentation, "index001.html", and the PDF or PostScript paper as "paper001.pdf" or "paper001.ps". Also the presentation material should be included as "pres001". Also there should be an example web presentation for the authors to view. Martikainen, J., Tanskanen, J., Gao, X. Z. and Ovaska, S.J. (2001).
Authors should also be made aware of optimising techniques and general design techniques so as to keep the conference content to a sufficient standard.

Authors should be advised to take their file to a different computer so as to check whether their presentation is platform independent. Martikainen, J., Tanskanen, J., Gao, X. Z. and Ovaska, S.J. (2001).

Submission should be made by ftp if possible as some organisations have size restrictions on in and out going mail.

6.2.4. Exhibitors and Sponsors

Co sponsorship and exhibitions from international or national organisations can improve the public image of the conference. It is also an area were extra revenue can be generated.

6.2.5. Length of Conference

The length to which the conference is to be active should be based on the objectives and the participants. It should be communicated at the beginning of the conference. On-Line Conferencing White Paper,(2001). Should the conference need to be extended due to participants still contributing to the forum or not as the case may be, with asynchronous conferencing this can easily be done.

Single or Series

Decisions on whether the conference is to be a single event or a series of events. This will be identified once the objectives are identified.

6.2.6. Open or Closed

Depending on the objectives of the conference, a decision should be made on whether it is to be limited to a particular group of participants (closed) or open to everyone with Internet access (open). On-Line Conferencing White Paper, (2001).

6.2.7. Uni-lingual, Bilingual or Multi-lingual?

Is the conference a global conference? If this is the case then decision should be made on whether the conference would be beneficial to:

- Have one conference with different languages
- Have different conferences in different languages.

It has been identified that a bilingual conference works well only if the moderator is bilingual. On-Line Conferencing White Paper,(2001).
Also with English being the business language it is highly likely that all participants will be able to contribute in written English.

6.2.8. Mirror Site

Technical issues such as hardware, software malfunctions can be a problem when the virtual conference is active. To overcome these issues it I suggested that the whole virtual conference be mirrored at a different location. The alternative mirror site should contain all content of the original and should have exactly the same web site system.

6.2.9. Back up

There can be technical issues that can be unforeseen and very problematic. Therefore it is suggested that taking backups of the whole system to another machine within suitable intervals i.e. when a correction or other change is made.

6.3. Promotion

Once the planning activities are complete it is very important for the virtual conference to be promoted so that awareness is created. A conference is successful if it can attract good quality papers in the right numbers, and that is very dependent on the public image of the conference. This requires that there be good promotion and marketing activities and strict reviewing of the presented papers.

6.3.1. Promotion Mechanisms

The conference can be promoted using both non-electronic media and electronic media. It is recommended that promotion of the virtual conference to online users should be by:

- Email
- Postings on existing electronic mailing list
- Announcements on web sites
- Newsgroups.

Newsgroups have been seen to be the media through which the biggest number of people can be reached.

The use of using virtual channels for the promotion of the conference can be affective due to it allowing for the tracking of its effectiveness and it offers a feedback mechanism, it also creates awareness in the same playing filed as the conference event. ConferZone White Paper, (2000).

If novice online users are to be targeted for participation, conventional promotional methods in print or audio-visual. A combination of both is best. On-Line Conferencing White Paper,(2001).

Areas that would be appropriate to market the conference in are:

- Internet Search Engines
- Banner ads- banner ads are one of the most traditional methods of advertising in the virtual world, but come at a cost. ConferZone White Paper, (2000).

6.3.2. Registration

The participants once targeted should be asked within the promotional activities to pre-register for the conference. This allows for the organisers to identify the approx. number of participants, also if the conference is to take a roundabout approach, to identify the topics of interest. Addition information should be asked in the registration stage to profile the participants.

This is also were there is a call for papers from authors to submit there research papers and presentation materials.

6.4. Preparation

Once questions about the purpose of the conference have been answered, the structure of the virtual conference must be designed.
Like face-to-face conferences, decision concerning the role of the moderator, participants and the conference structure must be made.

There are two methods of running a virtual conference and each one will influence the design of the conference structure.

6.4.1. Expert Approach

Running a conference using an expert approach is when an expert is at hand to provide information during the active period of the conference. Information is organised to reflect the logical sequencing of events and to facilitate understanding. This type of conference will be very structured and should start with the expert(s), giving a paper or information on a topic of the conference and asking questions to start the discussion. On-Line Conferencing White Paper,(2001).

A template conference structure would look like the following:

- **Welcome**
- **Guest book**
- **Posting guidelines**
- **Topic A** – questions raised and comments invited
- **Topic B** – questions raised and comments invited
- **Topic C** – questions raised and comments invited
- **Topic D** – questions raised and comments invited
- **Topic E** – questions raised and comments invited
- **Summary and Conclusion**

6.4.2. Roundtable Approach

In this approach participants can be involved in developing the agenda, raising issues and contributing comments. This approach will have minimal structure. This approach allows the participants to feel comfortable in the development of the structure. On-Line Conferencing White Paper,(2001).
A template conference structure should look like this:

- **Welcome message** – purpose of the conference
- **Read me first** –rules of the conference
- **Guest book** - participants sign and give info about them selves
- **Statements or questions** to start discussion

6.4.3. Site Design

Another area that needs to be considered in the preparation activity of the virtual conference is the site design. The following questions should be asked: On-Line Conferencing White Paper,(2001).

- Is the site 'user friendly' and encourages access?
- Will there be a help feature for people with limited computer skills?
- Will the site represent a real conference process?
- Has the 'visual clutter' been removed from the site?
- It the site simple in design?

The design of the conference should consider dissimilarity in networking facilities, cost of connecting to the Internet in different countries, and the speed of connection. On-Line Conferencing White Paper,(2001). This all leads to the content being optimised to allow for quick download times, such as all downloadable content should be packed, compressed. Also there should be a web-form trough which the author can easily submit their papers and presentations. Martikainen, J., Tanskanen, J., Gao, X. Z. and Ovaska, S.J. (2001).

Each paper submitted by an author should have its own message board, where participants can ask questions.

6.5. Production

The production activity is the active phase within the whole conference process.

It has been identified that the following are important to the success of the conference:

- Send a reminder email to pre-registered participants
- Send a welcome message once a participant has signed on. In this message repeat the purpose of the conference and give a list of what the participant should do next.

- Tell the participant an overview of the rules of the conference.
- Ask participants to introduce themselves to each other.
- Provide contact info of all participants (with permission).
- Provide a HELP function or list of were to look for assistance.

There are three aspects in managing a virtual conference, conceptual, administrative and technical. One person or three could manage all three aspects.
Conceptual involves an understanding of the subject of discussion or the ability to encourage or synthesise the discussion. You need to have someone that knows the subject area or someone who has access to the expert.
Administrative involves an understanding of the application software, i.e. how to us e the software and how to relate problems to the technical administrator.
Technical involves setting up and maintaining the software, hardware and mirror sites. On-Line Conferencing White Paper,(2001).

6.5.2. System Moderator

The system moderator is the person(s) that manages the virtual conference during the active period.

Their role consists of checking posting sent by users for inappropriate content. They will also be the first to contribute a posting to a topic area.

It has been identified that there are three areas to which the moderator should concentrate their efforts. The following will indicate the activities the moderator should do within each role area. On-Line Conferencing White Paper,(2001).

Social Role

- Sets the conference tone through the posting of the first messages (break the ice) and maintains the tone throughout the conference
- Identifies and removes inappropriate behaviour
- Thanks and encourages positive behaviour

- Raises issues and contributes to the conference when participation seems low
- Sends private emails to people who access the conference but do not contribute, so encouraging them to contribute.
- Encourages participants to make suggestions and to self regulate their participation

Intellectual Role

- Contributes by adding information and insight to the discussions without controlling the flow.
- Listens to participants and probes and clarifies information
- Synthesise the responses, which demonstrates to the group that they have accomplished something and that there id direction in their discussion.

Organisational

- Provides summaries of posted information. The summitries allow the participants to see patterns in the contributions and to keep them getting lost in detail.
- Summarise the discussion
- List any outstanding items
- Submit a leading question designed to stimulate discussion
- Conclude to conference by thanking everyone on final day by email.
- Indicate what will happen when the conference has closed.
- Send proceedings
- Monitors discussion to insure that participants are behaving according to the ground rules.

6.6. Post Event

Follow up is the end activity that should be undertaken in a virtual conference, but should be taken into account when planning and developing the event.
There are two fundamental areas.

- Archiving

- Follow up.

6.6.1 Archiving

Archiving should be used when the events content needs to lead beyond the active life of the conference. It can be used as a good reference point and a strong indicator of what can be improved upon.
Archiving is also essential for the conference proceeding to be developed. The proceeding would consist of the author's papers and posted message content. The most effective media for this is the use of electronic, CD-ROM.
The preparation of digital proceedings is as precise work as the work done with a printed one. The time to prepare both is roughly equal. However the price of digital proceeding is far cheaper than that of print. The CD-ROM version also offers more possibilities to present information than printed proceedings.

It has also been identified that people will visit the conference after the event, so indicating that the conference content should be keep alive for some time after the actual conference has ended.

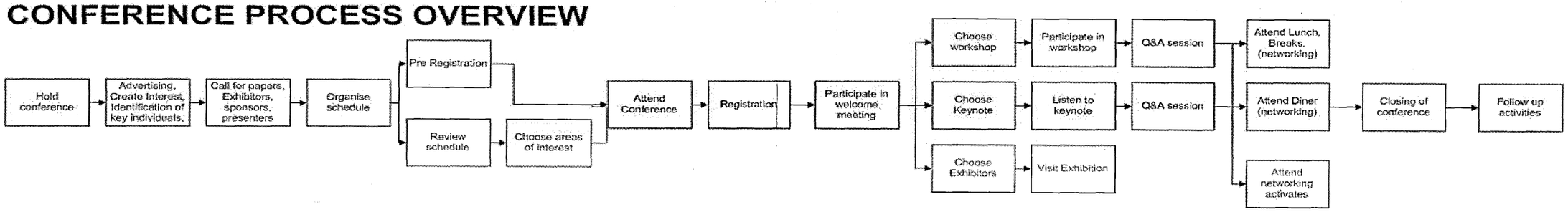
6.6.2. Follow-up

Follow-up of a virtual conference is an essential activity. It should be developed in advance so that the activities are successful. Some activities include:

- Each participant should receive a thank you email within 48hrs of the event closing
- Next contact should be information about a future event
- Lead management should be defined.
- Survey forms should be incorporated. A good idea is to have the participants give feedback on the event.

The follow up can be very helpful in identifying what problems the participants faced. This then can be used to improve the conference next time.

CONFERENCE PROCESS OVERVIEW



PLANNING

- ☐ Have you identified the objectives of the conference?
- ☐ Ask the question why are you holding this conference?
- ☐ What do you want to gain from this conference?
- ☐ Have you identified if the virtual conference is to take an Expert Approach or Roundabout Approach?
- ☐ Are the topics of the conference clearly identified?
- ☐ Have you identified possible lists of potential participants and authors?
- ☐ Do you have authors that are experts and peers in their chosen area?
- ☐ Are the papers submitted in the form of PDF or PostScript?
- ☐ Is the presentation content in html format?
- ☐ Are the papers being submitted as eg a folder called: "paper001". This folder should include the index page of the web presentation, "index001.html", and the pdf or PostScript paper as "paper001.pdf" or "paper001.ps". Also the presentation material should be included as "pres001"?
- ☐ Have the authors been made aware of optimising techniques and general design of submission materials?
- ☐ Have authors been advised to take their file to a different computer so as to check whether their presentation is platform independent?
- ☐ Is the content being submitted by ftp?
- ☐ Have you identified and contacted possible co - sponsorship and exhibitors?
- ☐ Has the length of the conference been identified based on the objectives and the target participants?
- ☐ Has the decision on whether the conference is to be a single event or a series of events been made?
- ☐ Has a decision on whether the conference is to be limited to a particular group of participants (closed) or open to everyone with Internet access (open) been made?
- ☐ Will the conference be Uni-lingual, Bilingual or Multi-lingual?
- ☐ Will you have one conference with different languages?
- ☐ Will you have different conferences in different languages?
- ☐ Has the whole virtual conference be mirrored at a different location?
- ☐ Does the alternative mirror site contain all content of the original and have exactly the same web site system?
- ☐ Have you set in place mechanisms so to take backups of the whole system to another machine within suitable intervals?
- ☐ Have you defined success metrics?

PROMOTION

- ☐ Have you identified participant target groups?
- ☐ Have you promoted the conference through the following channels:
- ☐ Email?
- ☐ Postings on existing electronic mailing list/ listservs?
- ☐ Announcements on web sites?
- ☐ Newsgroups?
- ☐ Have you targeted novice on-line users: by conventional promotional methods in print or audio-visual?
- ☐ Have you put the conference on Internet 'Search Engines' ?
- ☐ Have you advertised the conference using 'banner ads'?

PREPARATION

- ☐ If pictures are to being submitted as part of the presentation material, is there clear instructions to do so?
- ☐ Is there a checklist that should be completed by the author to insure all materials have been uploaded correctly?
- ☐ Is there only one mechanism to allow for the uploading of content?
- ☐ Is there an example web presentation for the authors to view?
- ☐ Are there clear instructions on how to optimise the submitted content?
- ☐ Has the length of the conference been communicated to all participants?
- ☐ Is the site 'user friendly' and encourages access?
- ☐ Is there a help feature for people with limited computer skills?
- ☐ Does the site represent a real conference process?
- ☐ Has the 'visual clutter' been removed from the site?
- ☐ Is the site simple in design?
- ☐ Has the design of the conference considered dissimilarity in networking facilities, cost of connecting to the Internet in different countries, and the speed of connections?
- ☐ Does each paper have its own message board?
- ☐ Has a reminder email been sent to pre-registered participants?
- ☐ Has a HELP function been provided or list of were to look for assistance?
- ☐ Have survey forms been incorporated in the design?

PRODUCTION

- ☐ Has a welcome message been sent to all participants once they have signed on?
- ☐ Does this message repeat the purpose of the conference and give a list of what the participant should do next?
- ☐ Have the participants been given an overview of the rules of the conference?
- ☐ Have the participants been asked to introduce themselves to each other?
- ☐ Has contact info been provided of all participants? (with permission)
- ☐ Has a HELP function been provided or list of were to look for assistance?
- ☐ Does the moderator role consists of checking posting sent by users for inappropriate content?
- ☐ Has the moderator been the first to contribute a posting to a topic area?
- ☐ Has the moderator set the conference tone through the posting of the first messages and maintaining the tone throughout the conference?
- ☐ Has the moderator identified and removed inappropriate behaviour?
- ☐ Has the moderator thanked and encouraged positive behaviour?
- ☐ Has the moderator raised issues and contributed to the conference when participation seems low?
- ☐ Has the moderator sent private emails to people who accessed the conference but do not contribute, so encouraging them to contribute?
- ☐ Has the moderator encouraged participants to make suggestions and to self regulate their participation?
- ☐ Has the moderator contributed by adding information and insight to the discussions without controlling the flow?
- ☐ Has the moderator listened to participants and probed and clarified information?
- ☐ Has the moderator synthesised the responses, which demonstrates to the group that they have accomplished something?
- ☐ Has the moderator provided summaries of posted information. The summitries allow the participants to see patterns in the contributions and to keeps them from getting lost in detail?

POST-EVENT

- ☐ Has the moderator concluded the conference by thanking everyone on the final day by email?
- ☐ Have the participants been given an indication of what will happen when the conference has closed?
- ☐ Have the proceedings been developed on Cd-rom?
- ☐ Have the proceedings been sent?
- ☐ Will the conference be kept alive for some time after the actual conference has ended?
- ☐ Has each participant received a thank you email within 48 hrs of the event closing?
- ☐ Has lead management be defined and followed?
- ☐ Have participants sent back survey forms?

To achieve 'best practice' in Virtual Conference you must answer 'YES' to all the above questions.

Figure 21: Best Practice Checklist

6.7. Best Practise Checklist

The analysis and development of best practise had resulted in the development of a "virtual conference checklist".
This checklist contains a number of questions grouped into the following areas:

- Planning
- Promotion
- Preparation
- Production
- Post-event.

The checklist has been designed so that in order to achieve best practice every question contained in the checklist should be answered with a YES. The checklist can be seen in Figure 20. The checklist also contains the virtual conference process overview, which will add the user in designing the conference in the virtual environment.

6.8. Summary

This chapter has presented the findings of this research as a best practice guide to virtual conference.

The chapter has grouped the results into the following areas, Planning, Promotion, Preparation, Production and Post-Event.

The chapter has also presented a checklist containing a set of questions grouped in to planning, promotion, preparation, and production and post-event activities that should be asked by the reader in order to achieve best practice in virtual conference

The three objective results and findings have been presented, therefore the next chapter will present the discussion of the research project as a whole, the contribution to knowledge and the further work.

CHAPTER 7 – DISCUSSION

This chapter will present the discussion concerning the project as a whole; it will initially describe an overview of the research, the projects contribution to knowledge, before discussing further applications and research limitations. It will also describe how the results have been analysed and compared to other work.

7.1. Discussion

Further collaboration is very important to the success of the Decision Engineering Mission. Therefore a virtual conference has been identified as a way forward in allowing further collaboration while achieving the Decision Engineering Mission objectives.

The research project has delivered a virtual conference AS:IS model, which identifies the process, features, user groups and types of virtual conference. It has delivered an SSADM Requirements Specification document that will allow for the prototyping of virtual conference and encapsulating best practice for a high technology area. The project has also delivered a best practice guide and best practice checklist grouped into the planning, promotion, preparation, production and post-event activities.

The literature review has shown that virtual conference is an important tool and has some distinctive advantages over conventional conference. Existing studies have been conducted in an academic environment. Were these studies lack is asynchronous virtual conference application in a high technology business environment.

Victual conference has had limited studies undertaken by companies as seen in some white papers identified in the literature but there has been no academic research of virtual conference within this industrial environment. Therefore this thesis and research is needed.

The research covered the gap and has identified best practice in virtual conference for a high technology area.

The research methodology used an email-based questionnaire in the identification of requirements and issues. The reply was low and this may be due to the format in which it was sent. The use of a web-based questionnaire may have been a more appropriate tool in gaining people's views and feature requirements and could have possible increased the reply percentage.

The questionnaire response rate was 100% from Decision Engineering Mission Members so the author can conclude that the results are reliable and are representative of Decision Engineering Members. However results from the wider community were low and therefore may not be a true representation of industry as a whole and therefore can not be reliable. The sample strategy was also not random.

Email questionnaires were used rather then postal due to the cost reduction and the ease for the participant to respond to the questions. The anonymous questionnaire allowed for the answers to be less bias. Bias was also reduced due to the researcher not being present when the questionnaire was completed.

The conference AS:IS results presented in this thesis were validated by member checking with a member of Cranfield Conference Development staff. Therefore the author concludes that they are reliable.

The literature identified that the use of SSADM for user requirement capture was the most appropriate methodology to use. Requirements for virtual conferences were documented through the use of The Structured Systems Analysis and Design Method (SSADM). The documentation fully specified the virtual conference system. These requirements also encapsulated best practice

A typical medium sized project using the SSADM methodology can consist of 4-5 man-years. This project was only concerned with modules 2 and 3 of SSADM

and the project length was 3 months. It therefore can be said that for a fully documented and validated requirement specification would require more time than this project has permitted.

SSADM methodology is based on a 'waterfall method' in which the stages and modules have to be fully completed before the next stage can start. This has created problems in that the final requirement specification documentation needed to be submitted to another researcher for the development of the virtual conference prototype. This in turn required the project to be managed concurrently due to both researchers working during the same time period. It was identified that there was conflict between the management of the project i.e. the concurrent aspects and the SSADM methodology, which does not allow for any concurrency.

User requirement capture results however are specific to the Decision Engineering Mission. The user requirements were based on the Decision Engineering virtual conference objectives and would not be appropriate for the use of any other conference.

The questionnaires identified the issues, goals and success indicators when participating in a virtual conference. Recommendations were then suggested aimed at overcoming the issues, meeting the identified gaols and success indicators and therefore creating best practice. The recommendations have been carefully considered but have not been validated and so therefore can not be fully justified as being the most appropriate method in overcoming that issue or reaching the goals.

The best practice has been grouped into the 5Ps, Planning, Promotion, Preparation, Production, Post-Event and a checklist was developed. While the checklist creates awareness of the issues that should be addressed it does not however describe how to address these issues, due to the generic nature of it contents and the understanding that every conference objectives will be different.

Best practice has been identified through literature and questionnaires, for a high technology area, it is not dependent on that sector. The identified best practice is sufficiently generic for it to be possible to apply it to other sector. Also the presented virtual conference AS:IS process can be used for the development of virtual conference for other sectors.

The sponsoring companies have benefited from this research project as they now have a fully documented virtual conference AS:IS model. The company now understands what requirements the DEMM want concerning participation in a virtual conference and have best practice in the management of virtual conference for a high technology area.

7.2. Contribution to Knowledge

The research has identified and developed a requirement specification, which will allow for the design of a virtual conference for high technology area. Also a checklist encapsulating best practice has been developed for the use of virtual conference in high technology area business environment. The checklist consists of best practice for the 5Ps, Planning, Promotion, Preparation, Production and Post-event.

7.3. Further Application and Research Limitations

The checklist developed operates as a tool, which will allow for best practice to be reached when developing and conducting a virtual conference in a high technology area. While the research objectives were reached, limitations in the research will be commented on in the following.

While the questionnaire replies were enough to base this research on, the research would have benefited further if more issues with the participation of virtual conference had been identified.

Should an enterprise wish to develop a virtual conference, infrastructure constraints internal and external i.e. the target participants, need to be

identified. Therefore a framework for this identification could be developed and incorporated as an extension of the checklist.

The research did not conduct a cost-benefit analysis, especially important when introducing a new tool to a business. Also future research could conduct an impact analysis of a virtual conference implemented in a business environment.

7.4. Summary

The project as a whole has been discussed, a description of how the project results have been analysed and compared to previous work has been presented. The contribution to knowledge has been presented and further work and research limitations discussed. The next and final chapter will present the conclusion of the research project.

CHAPTER 8 - CONCLUSIONS

The project described in this thesis aimed to develop best practice in virtual conference for high technology area and also to analysis and identify user requirements for Decision Engineering Virtual Conference. The research succeeded by the delivery of SSADM documentation and a best practice checklist.

After the proposed methodology for identifying user requirements and best practice the research set objectives, to identify virtual conference AS: IS, to identify the user requirements for virtual conference and to identify best practice virtual conference for high technology area.

Virtual conference AS:IS was concerned with the identification of the real and virtual conference processes, the two types of conference were identified asynchronous and synchronous. Also the features of both asynchronous and synchronous conference were identified. Virtual conference AS: IS also identified the extent to which virtual conference was used in industry.

User requirements capture was identified and fully documented through the requirement analysis and specification modules of The Structured Systems Analysis and Design Method (SSADM).

Finally, the best practice of virtual conference in high technology area was identified and a checklist was developed.

It is concluded that this research has produced a requirement specification for the development of a virtual conference in high technology area, as well as a checklist tool, which will allow for best practice in virtual conference for high technology area to be achieved.

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APPENDIX: A. SSADM. The Structured Systems Analysis and Design Method Virtual Conference Requirements Specification

Functional Name	**DFD Processes**	**Function Type**		
		Initiation	Mode	Update or Enquiry
Authenticate password	1	System	Off-line	Enquiry
Check registration form	2	User	On-line	Enquiry
Send e-mail	3	System	Off-line	Enquiry
Inform moderator	4	System	Off-line	Enquiry
Check postings	5	User	On-line	Update
Send e-mail	7	System	Off-line	Enquiry
Edit message	8	User	On-line	Update
Edit profile	9	User	On-line	Update
Edit user	10	User	On-line	Update
Edit topic	11	User	On-line	Update
Edit group	12	User	On-line	Update
Edit option	13	User	On-line	Update
Edit appearance	15	User	On-line	Update
Edit moderator	16	User	On-line	Update
Edit page	17	User	On-line	Update
Choose session	18	User	On-line	Enquiry
Log on to conference	19	User	On-line	Enquiry
Send collect forms	20	System	Off-line	Update
Analysis of conference	28	System	Off-line	Update
Choose keynote	29	User	On-line	Enquiry
Choose Exhibition	30	User	On-line	Update
Search for message	32	System	Off-line	Enquiry
Translate language	33	System	Off-line	Update
Open application	34	System	Off-line	Update
Introduction		User	On-line	Enquiry
Mission Objectives		User	On-line	Enquiry
Executive Summary		User	On-line	Enquiry

Notes from the mission		User	On-line	Enquiry
Manager		User	On-line	Enquiry
About cranfield		User	On-line	Enquiry
Sponsors		User	On-line	Enquiry
Mission members		User	On-line	Enquiry
Mission participants		User	On-line	Enquiry
Exhibitions		User	On-line	Enquiry
Presentations		User	On-line	Enquiry
Site administration		User	On-line	Enquiry
Online calendar		User	On-line	Enquiry
View program		User	On-line	Enquiry
Registration		User	On-line	Enquiry
Open ceremony intro		User	On-line	Enquiry
Keynote address		User	On-line	Enquiry
Q,A		User	On-line	Enquiry
Break		User	On-line	Enquiry
Visit exhibitions		User	On-line	Enquiry
Virtual market		User	On-line	Enquiry
Closing address		User	On-line	Enquiry
Contact list		User	On-line	Enquiry
CV of mission members		User	On-line	Enquiry

Process / Data Store Matrix

Process	ID	Responsible	Data store					
			Text Message	Account Details	Content	Papers	Access rights	Exhibits
Authenticate password	1	System		X				
Check registration form	2	Moderator		X				
Send e-mail	3	System	X					
Inform moderator	4	System	X					
Check postings	5	Moderator	X					
Sends notification	6	System	X					
Send e-mail	7	System	X					
Edit message	8	Moderator	X	X				
Edit profile	9	Moderator		X				
Edit user	10	Moderator		X	X			
Edit topic	11	Admin			X			
Edit group	12	Admin		X				
Edit option	13	Admin			X			
Send or receive	14	Admin			X			
Edit appearance	15	Admin			X			
Edit moderator	16	Admin		X				
Edit page	17	Moderator			X			
Choose session	18	User		X				
Log on to conference	19	User		X				
Send collect forms	20	Admin		X				
Except / reject	22	Admin		X		X		
Organise received papers	23	Admin						
Accept reject	26	Admin						

Design exhibition Stands	27	Admin		X				
Analysis of conference	28	System						
Choose keynote	29	User		X				
Choose Exhibition	30	User		X				
Publish proceedings	31	System				X		
Search for message	32	System	X					
Translate language	33	System			X			
Open application	34	System						

User Role / Function Matrix

Process	ID	User						
		User	Administrator	Moderator	Author	Conference holder	System (automated)	Exhibitor
Authenticate password	1	X	X	X				
Check registration form	2			X			X	
Send e-mail	3						X	
Inform moderator	4			X				
Check postings	5						X	
Sends notification	6						X	
Send e-mail	7		X					
Edit message	8		X					
Edit profile	9		X					
Edit user	10		X					
Edit topic	11		X					
Edit group	12		X					
Edit option	13		X					
Send or receive	14		X					
Edit appearance	15		X					
Edit moderator	16		X					
Edit page	17	X						
Choose session	18	X						
Log on to conference	19	X	X	X				
Send collect forms	20		X					
Except / reject	22		X					
Organise received papers	23							

Accept reject	26							X
Design exhibition Stands	27							
Analysis of conference	28							
Choose keynote	29	X						
Choose Exhibition	30	X						
Publish proceedings	31		X					
Search for message	32	X						
Translate language	33	X						
Open application	34	X						

Logical Data Store /Entity Cross Reference		
Store ID	**Data Store Name**	Entities
	Text Messages	Message
	Account details	User Registration Moderator
	Content	Site
	Papers	Authors
	Access rights	Administrato
	Exhibits	Exhibitor

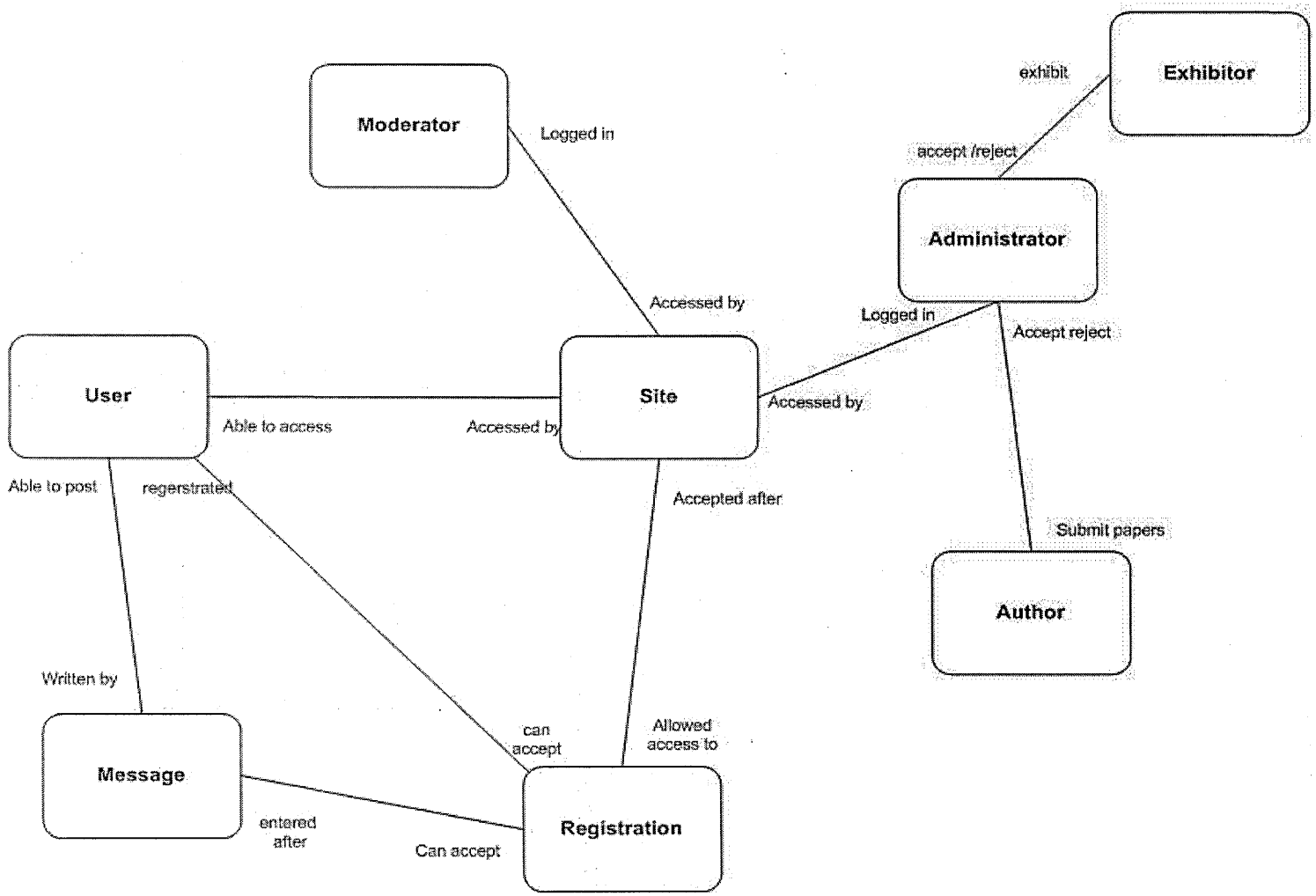
Current System Data (forum) Entity Grid

	User	Administrator	Moderator	Registration	Messages	Login
User				x	x	x
Administrator					x	x
Moderator					x	x
Registration					x	x
Messages						x
Login						

Business Solutions Virtual Conference Entity Grid

	User	Administrator	Moderator	Registration	Messages	Login	Author	Exhibitor
User				x	x	x		
Administrator					x	x	x	x
Moderator					x	x		
Registration					x	x	x	
Messages						x		
Login							x	
Author								
Exhibitor								

Required Logical Data Structure Diagram (Business Solution)



EXTERNAL ENTITY DESCRIPTIONS

Current / Logical / Required

ID	NAME	DESCRIPTION
g	External System	A users computer accessing the internet using a browser
h	Exhibitor	Is an external enterprise or person that wishes to exhibit their product to the conference users
i	Author	This is the person that will have contribute papers and the presentation content of the conference
j	Author email	The email system that the author is using.

USER CATALOGUE

JOB TITLE	JOB ACTIVITES DESCRIPITION
Administrator	**The administrator will deal with all the organisation issues of the conference before it goes live. The administrator had total access and control of the conference.**
Moderator	**The moderator will check posted messages and allow new registry to access the system during the period of the conference.**
General User	**The user will access the system and participate in the conference by viewing the content and adding comments to the message board.**
Author	**The author will submit papers and presentation material for the user to view.**
Exhibitor	**Is the person or enterprise that will upload presentation materials of their products, services to the admin so that they can be presented to the conference user.**

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Administrator

Mandatory	x	Optional	%Optional

Link phase: Logged in

Description:
Synonym(s)

Object entity name: Site

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Admin	**All**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current / Required / Enhanced

Entity Name: Administrator

Mandatory X	Optional	%Optional

Link phase: Accept Reject

Description:
Synonym(s)

Object entity name: Author

One(1:) X Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Admin	**All**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current / Required / Enhanced

Entity Name: Administrator

Mandatory X	Optional	%Optional

Link phase: Accept Reject

Description:
Synonym(s)

Object entity name: Exhibitor

One(1:) X Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Admin	**All**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current / Required / Enhanced

Entity Name: Author

Mandatory X	Optional	%Optional

Link phase: Submit papers

Description:
Synonym(s)

Object entity name: Exhibitor

One(1:) X Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Author	**Upload**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current / Required / Enhanced

Entity Name: Exhibition

Mandatory X	Optional	%Optional

Link phase: Exhibit

Description:
Synonym(s)

Object entity name: Admin

One(1:) X Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Exhibitor	**Upload**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Message

Mandatory x	Optional	%Optional

Link phase: written by

Description:
Synonym(s)

Object entity name: user

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Message

Mandatory	x	Optional	%Optional

Link phase: entered after

Description:
Synonym(s)

Object entity name: Registration

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Moderator

Mandatory	x	Optional	%Optional

Link phase: Logged in

Description:
Synonym(s)

Object entity name: Site

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Moderator	**Write, Read, Edit**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Registration

Mandatory	x	Optional	%Optional

Link phase: Taken by

Description:
Synonym(s)

Object entity name: User

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Registration

Mandatory	x	Optional	%Optional

Link phase: can accept

Description:
Synonym(s)

Object entity name: Message

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Registration

Mandatory	x	Optional	%Optional

Link phase: allows access to

Description:
Synonym(s)

Object entity name: Site

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Moderator **User** **Administrator**	**Read, write, edit** **Read , write** **All**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Site

Mandatory	x	Optional	%Optional

Link phase: Accessed by

Description:
Synonym(s)

Object entity name: Administrator

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Admin	**All**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Site

Mandatory	x	Optional	%Optional

Link phase: Accessed by

Description:
Synonym(s)

Object entity name: Moderator

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Moderator	**Read, write, Edit**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Site

Mandatory	x	Optional	%Optional

Link phase: Accessed after

Description:
Synonym(s)

Object entity name: Registration

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
Moderator **User**	**Read, write, Edit** **Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: Site

Mandatory	x	Optional	%Optional

Link phase: Accessed by

Description:
Synonym(s)

Object entity name: User

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: User

Mandatory	x	Optional	%Optional

Link phase: Able to access

Description:
Synonym(s)

Object entity name: Site

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: User

Mandatory	x	Optional	%Optional

Link phase: Register

Description:
Synonym(s)

Object entity name: Registration

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

RELATIONSHIP DESCRIPTION

Current /

Entity Name: User

Mandatory	x	Optional	%Optional

Link phase: Able to post

Description:
Synonym(s)

Object entity name: Message

One(1:) x Many(m:)	**Minimum:**	**Average:**	**Maximum:**
Cardinality description:			
Growth per period:			
Additional properties:			

User role:	**Access rights:**
User	**Read , write**
Owner: Admin	

Notes:

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Author	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
ID Registration, papers					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be		Submit papers	One & only one	Admin

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Administrator	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
Access rights to whole site User ID					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be		Logged in	1 and only 1	site

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Message	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
Text Author Time User ID Date					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be Must be		Written by Entered after	1 and only 1 1 and only 1	user registration

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Moderator	**Entity ID:**

Location	Occurrences	Average	Max

Description		
Synonyms		
Attribute name / ID	**Primary Key**	**Foreign Key**
Access rights Editing rights User ID		

Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be		Logged in	1 and only 1	site

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Registration	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
Name, Address Tel, Fax Topics of interest User ID					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be Must be Must be		taken allowed access to done to post	1 and only 1 1 and only 1 1 and only 1	user site message

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Site	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
Content					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be		Accepted after	1 and only 1	registration
	Must be		Accessed by	1 and only 1	Administrator
	Must be		Accessed by	1 and only 1	Moderator
	Must be		Accessed by	1 and only 1	user

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: User	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
User ID Password					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	May be Must be Must be		Able to post Registered Able to access	1 and only 1 1 and only 1 1 and only 1	Message Registration site

Notes

ENTITY DESCRIPTION – Part 1

Current / Required / Enhanced

Entity Name: Exhibitor	**Entity ID:**

Location	Occurrences	Average	Max

Description					
Synonyms					
Attribute name / ID				**Primary Key**	**Foreign Key**
ID Registration, presentations					
Rel No.	'must be' **'may be'**	**'Either' / 'or'**	**Link phase**	**'one and only one' / one or many**	**Object entity name**
	Must be		Upload presentation	One & only one	Admin

Notes

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: Admin	**Entity ID**

User Role:	Access Rights
Admin	**All**
Owner: Admin	

Growth per period
Additional relationship
Admin will become user when participating in the conference
Archive and destruction
Security measures
All access
State Indicator Values
Notes

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: AUTHOR	**Entity ID**

User Role:	Access Rights
AUTHOR	UPLOAD
Owner: ADMIN	

Growth per period
Additional relationship
WILL BECOME A USER WHEN PARTISPATING IN THE CONFERENCE
Archive and destruction
PAPERS ARCHIVE PERMENTALY
Security measures
UPLOAD ACCESS ONLY
State Indicator Values

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: EXHIBITITOR	**Entity ID**

User Role:	Access Rights
EXHIBITOR	UPLOAD
Owner: ADMIN	

Growth per period
Additional relationship
WILL BECOME A USER WHEN PARTISPATING IN THE CONFERENCE
Archive and destruction
PRESENTATION OF PRODUCTS, ARCHIVE PERMENTALY
Security measures
UPLOAD ACCESS
State Indicator Values

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: Message	**Entity ID**

User Role:	Access Rights
User	**Read write**
Owner: Admin	

Growth per period
Additional relationship
Archive and destruction
After every posting permanently
Security measures
Registered users have access
State Indicator Values

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: Moderator	**Entity ID**

User Role:	Access Rights
Moderator	**Read write, edit**
Owner: Admin	

Growth per period
Additional relationship
Moderator will become a user when participating in the conference
Archive and destruction
Access rights archive permanently
Security measures
State Indicator Values

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: Registration	**Entity ID**

User Role:	Access Rights
Admin	**All**
User	**Read, write,**
Moderator	**Read write, edit**
Owner: Admin	

Growth per period
Additional relationship
Archive and destruction
Registration details archive permanently
Security measures
Generation of password
State Indicator Values
Notes

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: Site	**Entity ID**

User Role:	Access Rights
Admin	**All**
User	**Read, write,**
Moderator	**Read write, edit**
Owner: Admin	

Growth per period
Additional relationship
Archive and destruction
All content permanently
Security measures
Registered access
State Indicator Values
Notes

ENTITY DESCRIPTION - Part 2

Current / Required / Enhanced

Entity Name: User	**Entity ID**

User Role:	Access Rights
User	**Read write**
Owner: Admin	

Growth per period
Additional relationship
Archive and destruction
User details registration detail permanently
Security measures
State Indicator Values
Notes

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**26**

Process Name:
ACCEPT / REJECT

Common processing cross-reference	

Description
THE EXHIBITOR ONCE CONTACTED WILL ACCEPT OR REJECT THE OFFER TO EXHIBIT WITHIN THE SYSTEM.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**21**

Process Name:
EXCEPT / REJECT

Common processing cross-reference	

Description
THE ADMIN WILL CHECK ABSTARCTS SENT BY AUTHORS. IF THE PAPERS ARE OF RELEVENCE AND TO THE REQUIRED STANDARD THE ADI-MIN WILL ACCCEPT THEM IF THEY ARE NOT THE ADMIN WILL REJECT THEM.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**28**

Process Name:
ANALYSIS OF CONFERENCE

Common processing cross-reference	

Description
THE SYSTEM WILL DO STATITICAL ANALYSIS OF HOW MANY PEOPLE HAVE VISTED, PARTISPATED IN THE CONFERENCE LOCATION, WORK,

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**1**

Process Name:
AUTHENTICATE PASSWORD

Common processing cross-reference	

Description
THE USER WILL ENTER A USER NAME (EMAIL & PASSWORD) INTO A FORM, WHICH WILL BE PROCESSED BY THE SYSTEM. THE CORRECT DETAILS WILL BE MATCHED AGAINST THE ACCOUNT DETAILS FOR VERIFACATION TO ALLOW ACEESS TO THE SITE.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**5**

Process Name:
CHECK POSTING

Common processing cross-reference	

Description
THE MODERATOR WILL CHECK THE CONTENTS OF A NEW POSTING AND WILL ACCEPT OR REJECT IT FROM VISIBLITY TO OTHER USERS BASED ON IT CONTENT.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**2**

Process Name:
CHECK REGISTRATION FORM

Common processing cross-reference	

Description
A NEW USER WILL COMPLETE THE REGISTRATION FORM. THE SYSTEM WILL SEND THE FORM TO THE MODERATORS EMAIL WHO WILL THEN CHECK THE DETAILS TO SEE WETHER THE USER CAN BE ACCEPTED OR REJECTED ACCESS TO SYSTEM.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**30**

Process Name:
CHOOSE EXHIBITION

Common processing cross-reference	

Description
THE USER WILL CHOOSE AND ACCESSES AN EXHIBITION TO VIEW OF THEIR CHOOSE.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**29**

Process Name:
CHOOSE KEYNOTE

Common processing cross-reference	

Description
THE USER WILL HAVE CHOOSEN AREAS OF INTEREST. THE USER WILL ACCESS CONTENT PRESENTED BY THER KEYNOTE SPEAKER THAT IS RELEVENT TO THE CHOOEN AREA.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**18**

Process Name:
CHOOSE SESSION

Common processing cross-reference	

Description
THE USER WILL CHOOSE AN AREA OF INTEREST TO PARTISPATE IN. ONCE THE SESSION AREA IS SELECTED THE USER WILL VIEW IMAGEA PRESENTATIONS PAPERS AND MESSAGES THAT ARE RELEVENT TO THAT AREA OF INTEREST.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**27**

Process Name:
DESIGN EXHIBITION STANDS

Common processing cross-reference	

Description
THE EXHIBITOR WILL SEND THE EXHIBITION MATERIALS IN A HTML FORMAT. THE AMIN WILL ARRANGE THE EXHIBTION WITHIN THE SYSTEM TO BE EASILY ACCESED BY THE USER.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**15**

Process Name:
EDIT APPERANCE

Common processing cross-reference	

Description
THE ADMINSITARTOR WILL BE ABLE TO CHANGE THE APERANCE OF THE MESSAGE BORADS USER INTERFACE.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**12**

Process Name:
EDIT GROUP

Common processing cross-reference	

Description
THE ADMINISTARTOR WILL ADD OR DELETE A GROUP WHICH IS ASSIATED TO A TOPIC OF INTERST.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**8**

Process Name:
EDIT MESSAGE

Common processing cross-reference	

Description
THE MODERATOR HAS THE ABILITY TO EDIT A MESSAGE, REMOVE, REWORD A POSTED MESSAGE CURRENTLY VISIBLE ON THE MESSAGE BOARD.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**16**

Process Name:
EDIT MODERATOR

Common processing cross-reference	

Description
THE ADMINISTRATOR HAS CONTROL OVER WHO WILL BE A MODERATOR DURING THE CONFERENCE.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**13**

Process Name:
EDIT OPTON

Common processing cross-reference	

Description
THE ADMINISTRATOR WILL SPECIFY THE LENGTH OF THE POSTED MESSAGE, WILL AUTOMATE SCRIPTS SPECIFY THE CHARACTER SET, EDIT TIME ZONES ADD OR REMOVE IMAGES, EDIT THE CONTACT DETAILS AND CHANGE THE MESSAGE SEARCH OPTIONS.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**17**

Process Name:
EDIT PAGE

Common processing cross-reference	

Description
THE MODERATOR AFTER SELECTING A SPECIFIC TOPIC CAN ADD OD DELETE A SUBTOPIC, CHANGE THE PAGE LAYOUT AND ADD OR REMOVE AN ABOUT MESSAGE.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**9**

Process Name:
EDIT PROFILE

Common processing cross-reference	

Description
THE MODERATOR CAN CHANGE A USER PASSWORD, INDICATE WHETER THEY HAVE EMAIL NOTIFICATION AND EDIT PERSONAL DETAILS SUBMITTED ON THE REGISTRATION FORM.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**11**

Process Name:
EDIT TOPIC

Common processing cross-reference	

Description
THE ADMINISTARTOR WILL EDIT THE TILTE MESSAGE , CHANGE THE BOARD APPERANCE, SPECIFY META TAGS AND ADD AND REMOVE TOPICS.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**10**

Process Name:
EDIT USER

Common processing cross-reference	

Description
THE MODERATOR CAN CREATE A LIST OF THE USERS REGERSTERED WITH THE SYSTEM, ALLOW WHO HAS POSTING PREVILAGES, DELETE OR ADD A USER ALL WITH REGARD TO A CHOSSEN TOPIC.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**35**

Process Name:
FILL FORM

Common processing cross-reference	

Description
THE USER WILL ENTER RELEVENT TEXT INTO A FORM WHICH WILL BE PROCESSED TO GIVE THE DISIRED ACCESS.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**23**

Process Name:
IDENTIFY AUTHORS

Common processing cross-reference	

Description
THE ADMIN WILL IDENTIFY AUTORS THAT MAY WANT TO PRESENT WORK THAT IS RELEVENT TO THE DEM THAT THE CONFERENCE IS CONCERNED WITH.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**24**

Process Name:
INDENTIFY EXHIBITION / SPONSORS

Common processing cross-reference	

Description
THE ADMIN WILLI DENTIFY POTENTIAL SPONSORS AND EXHIBITIORS THAT WILL WANT TO ADVERTISE WITHIN THE SYSTEM.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**4**

Process Name:
INFORM MODERATOR

Common processing cross-reference	

Description
THE SYSTEM WILL AUTOMATE THE SENDING OF AN EMAIL TO THE MODERATORS EMAIL WHICH NOTIFYS THEM THAT THE USER HAS POSTED A NEW MESSSAGE WHICH NEED TO BE ACCEPTED OR REJECTED.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**19**

Process Name:
LOG ON TO CONFERENCE

Common processing cross-reference	

Description
THE USER ADMIN OR MODERATOR WILL ACCESS THE CONFERENCE BY THE USE OF AN EXTERNAL MACHINE, LOCATION. USING AN INTERNET BROWSER.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**34**

Process Name:
OPEN APPLICATION

Common processing cross-reference	

Description
THE USER IF REQUESTED WILL BE ABLE TO OPEN AN APPLICATION ON THEIR COMPUTER (NetMeeting)

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**22**

Process Name:
ORAGNISE RECEIVED PAPERS

Common processing cross-reference	

Description
THE ADMIN WILL ORGANISE AND ARRANGE THE RECEIVED PAPERS, PRESENTATION MATERIALS WITHIN THE SYSTEM SO THAT THEY CAN BE ACCESSED BY THE USER WITHIN THE CHOSEN SESSION AREA.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**31**

Process Name:
PUBLISH PROCEEDINGS

Common processing cross-reference	

Description
THE PAPERS AND CONTENTS OF THE POSTED MESSAGE THREADS SHALL BE PUBLISHED ON A CDROM OR BOOK.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**32**

Process Name:
SEARCH FOR A MESSAGE

Common processing cross-reference	

Description

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**14**

Process Name:
SEND OR RECIEVE

Common processing cross-reference	

Description
THE PROCESS WILL SEND REQUESTED DATA CONTAINED IN THE SYSTEM SUCH AS TEXT MESSAGES PRESENTAION MATERIALS TO AN EXTERNAL SYSTEM. THE PROCESS WILL RECEIVE ABOVE-MENTIONED MATERIALS, DATA FROM EXERNAL SYSTEMS.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**20**

Process Name:
SEND / COLLECT FORMS

Common processing cross-reference	

Description
THE ADMINISTRATOR WILL COLLECT COPYRIGHT AND REGISTRATION FORMS FROM THE AUTHORS THAT ARE INTERESTED IN SUBMITTING PAPERS TO THE CONFERENCE.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**3 / 7**

Process Name:
SEND EMAIL

Common processing cross-reference	

Description
THE SYSTEM WILL AUTOMATE THE SENDIND OF THE REGISTRATION DETAILS TO THE REQUESTED EMAIL.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**6**

Process Name:
SEND NOTIFICATION

Common processing cross-reference	

Description
AN EMAIL IS SENT TO THE USERS EMAIL ADDRESS INDICATING WHETER THE MODERATOR HAS ACCPTED OR REJECTED THE POSTING.

ELEMENTARY PROCESS DESRIPTION

Current Physical / Logical / Required System / Function Definition

Process ID/common processing reference	**33**

Process Name:
TRANSLATE LANGUAGE

Common processing cross-reference	

Description
ENGLISH LANGUAGE WILL BE TRANSLATED INTO RUSSIAN.

I/O DESCRIPTIONS

FROM	TO	DATA FLOW NAME	DATA CONTENT	COMMENTS
a. user	system	Password	user email password	
User	4. inform moderator	Post message	text, message thread	
user	send email	Registration details	name, address, organisation, contact details, topics of interest, date of submission,	
user	34. open application	Synchronous		
user	33. translate language	interaction request word	?	

user	32. search for message	search request	English text word	
user	15. edit appearance	change interface request	Word English text ?	
4. inform moderator	moderator email	notification of new posting		
3. send email	moderator email	notification of new registry	sender of posting , name, time zone registration details	
34. open application	g. external system	open application	?	
2. check registration form	6. sends notification	except or reject	registration details	
6. sends	user email	except		

notification				
6. sends notification	user email	reject	name, address password, text	
33. translate language	system	translate word	name, address, text	
32 search for message	system	search results	Russian translation	
7. send email	b. user email	notification of new posting	Found results, text, word	
d. system	7. send email	posting	Name of user, sender id, email address, message	
5. check posting	system	posted message	User ID, text message	
5. check posting	8. edit message	rejected	Text message	

8. edit message	d. system	edited message	Text message	
9. edit page	system	edited profile	Text message	
authenticate password	9. edit profile	edit request	Personal information, name, address, email ,password	
authenticate password	10. edit user	edit request	?	
10. edit user	system	edited user	?	
e. moderator	authenticate password	password	topics, details new user name, id	
1. authenticate	17. edit page	edit request	user name password	

password				
17. edit page	system	edited page	?	
authenticate password	14. send or receive	presentation text	sub topic text, title, page layout, about message text topic	
g. external system	14. send or receive	presentation text	presentation PP, HTML text messages	
1. authenticate password	15. edit appearance	change appearance request	PP, HTML text messages	
authenticate password	13. edit option	option change request	?	
authenticate password	16. edit moderator	moderator request	?	

authenticate password	12. edit option	group request	?	
authenticate password	11. edit topic	topic request	?	
f. admin	authenticate password	password	?	
f. admin	31. publish proceedings	papers	user name, password	
31. publish proceedings	g. external system	book , CD-ROM	paper text messages, user details, author details	
15. edit appearance	system	update appearance	papers text messages, user author details	
			images posting of text	

13 edit option	system	updated option	time zone, images, character set, contact information, length of message	
16. edit moderator	d. system	updated moderator	moderator id ,access rights	
12. edit group	d. system	updated group	users topics	
27. design exhibition stands	d. system	exhibition stand	HTML presentation of exhibition	
d. system	28. analysis of conference	questionnaires	Contact details least importance functions, extra function liked to incorporate, rating of	

			experience had, difficulties faced using	
29, choose keynote	d. system	keynote papers	the site.	
30. choose exhibition	d. system	exhibition stands	key note text presentation material	
18. choose session	d. system	session papers	HTML exhibition material	
20. send collect forms	d. system	form details	Paper author persecution PP	
23 organise received papers	d. system	final papers, presentation materials	Copyright form	
28. analysis of conference	j. author email	analysis of details	Papers, presentation material	

22. except or reject	j. author email	accept reject notification	No. user, location, job title, no. of visitors to paper,	
24 identify authors	j. author email	call for papers	Text letter	
i. author	22. except reject	send papers abstracts	Text notification	
i. author	23 organise received papers	find papers presentation materials	Papers	
author	20. send collect forms	form details	Papers presumptions	
author	authenticate password	password		
1. authenticate password	19. log in to conference	password	Copyright forms	
19. log on to conference	18. choose session	session request	User name password	
			User name password	

g. external system	19. log on to conference	conference request	?	
19, log on to conference	30. choose exhibition	exhibition request	?	
19 log on to conference	29. choose keynote	keynote request	?	
h. conference holder	24. identify authors	hold conference request	?	
h. conference holder	25. identify exhibitors and sponsors	hold conference request	?	
25. identify exhibitors and sponsors	26. accept reject	interest promotional details	?	

26. accept / reject	28. design exhibition stands	exhibition data	text notification HTML presentation	

APPENDIX: B. Survey Questionnaires.

- 9th ISPE International Conference on Concurrent Engineering: Research and Application, Decision Engineering Workshop Attendees
- World Conference on Soft Computing in Industrial Application Attendees
- Decision Engineering Mission Members

9th ISPE International Conference on Concurrent Engineering: Research and Application, Decision Engineering Workshop

Virtual Conference, Application in Industry

Questionnaire (4)

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Introduction:

Dear Sir Madame,

This questionnaire provides the basis for identification of the current use of virtual discussion - conference in the industry and the capture of user requirements for participating in a virtual discussion on Decision Engineering.

The results obtained from this questionnaire will be employed to identify the current use and practise of virtual conference –discussion in industry.

Please complete the questionnaire by writing your answers in the answer box provided. Additional space has been given for answers, at the end, should you need it.

An additional table at the end of some answer boxes has been incorporated. This is where we would like you to priorities your answers in terms of importance when participating in a virtual conference.
A scale of 1-5 has been used 1 meaning of low importance, 5 meaning of high importance when participating in a Virtual Conference.

ANSWER BOX	3

We suggest that you answer all questions in the questionnaire first then go back and prioritise your answers.

This is due to answers being possibly left out of the questionnaire due to them being classified as of low importance there is also a possibility that the prioritising will not relate to the question.

CONFIDENTIAL QUESTIONNAIRE

SECTION 1: DEFINITIONS

Virtual Discussion: Asynchronous environments were the knowledge transfer and interaction is achieved by the posting of text messages into a web environment. (Discussion Forum)

Virtual Conference: An environment no different to that of a real conference except that the WWW is used as the communication tool. (Can be an asynchronous or synchronous environment)

Real-time video streaming: ***The* ability to view participants via live video in real time over the Internet.**

Real time audio: The ability to communicate using voice in real time via the Internet.

Real time text messaging: The ability to communicate via text over the Internet in real time.

White board sharing: An application environment that allows for participants to draw in and share over the Internet. E.g. windows paint.

Application sharing: The ability to share software applications between participants over the Internet.

Presentation slides: The ability to present presentation slides via an internet environment.

SECTION 2: CONTACT DETAILS

Please fill this section with your company contact details.

Name:

Address:

Postcode:

Tel:

Fax:

E-mail:

SECTION 3: BACKGROUND

1.What is your sector of business?

2.What is the nature of your deliverables?

3. Please determine number of employees.

3.1: Content

1. What topics are you interested in with regard to Decision Engineering?

Tick	Area of interest		Priority 1 low – 5 high
Cost Engineering			
Cost Estimating			
Knowledge Capture and Reuse			
Intelligent System Application			
Other: Please state			

Please use additional paper if required:

2. What addition information would you like to access if you were participating in a virtual discussion on Decision Engineering?

	Priority 1 low – 5 high

Please use additional paper if required:

3.2: Features

1. What features / functions would you like to have when participating in a virtual discussion on Decision Engineering? What would you like to do? What would you like the software to do? Please indicate why.

	Priority Tick	Why	1 low – 5 high
Editing of messages			
Export message facilities			
Email notification of New postings			
Search message capabilities			
User interface in difference languages			
Customisable interface			
Language translator			
Other: **please specify**			

Please use additional paper if required:

2. Do you use any exiting software / tools that you would like to incorporate with a virtual discussion?

	Priority 1 low – 5 high

Please use additional paper if required:

SECTION 4: VIRTUAL CONFERENCE

1. Have you used any of the following methods of Conference / Discussion in any area of the business?

	Yes	No	NA	Priority 1 low – 5 high	
Virtual discussion forums					
'Real Conferences'					
Virtual Conferences					
Real time video streaming					
Real time audio					
Real time text messaging (IRC)					
White board sharing					
Application sharing					
Presentation slides					
E-mail					
Web tours					
Other: please specify					

1.If you have answered yes to any of Q1 please indicate in what situation and business environment,

Please use additional paper if required:

2. If you have answered yes to any of the answers in Q1. Please indicate the seen benefit of using such a tool.

Please use additional paper if required:

3. If you have answered yes to any of the answers in Q1. Please indicate the problems you encountered using such a tool, if any?

Please use additional paper if required:

4. If you have answered yes to any of the answers in Q1. How much time did you allocate for participation? How often did you login?

5. Which of the following tools would you like to see in use in your company?

Please indicate why you think you would like to use the tool.

	Tick	Why	Priority 1 low – 5 high
Discussion forums			
Asynchronous Virtual Conferences			
Real time video streaming			
Real time audio			
Real time text messaging (IRC)			
White board sharing			
Application sharing			
Presentation slides			
Web tours			
Other: please specify			

6. When would you consider using a virtual discussion forum? In what situation?

Please use additional paper if required:

7. What benefits would you like to see from using a virtual conference tool?

Please use additional paper if required:

8. Would you be willing to pay to attend the Virtual Conference? Please indicate how much?

Yes	No	How much

9. Would your company be interested in exhibiting during the conference?

Yes	No	N/A

SECTION 5: IT INFASTRUCTURE

1.Within the company how many people have access to the World Wide Web?

2. Please indicate position(s) and level of responsibility of employees with access to WWW.

3. For what propose(s) is the WWW used for?

4. **What is your IT infrastructure? (Connection type / use own server)**

5. **Do you now to what degree your customers / company relations have access the internet? Please indicate.**

6. **To what level is your IT support?**
   Please indicate using the scale 1-Low 5- High.

World Conference on Soft Computing in Industrial Application

Virtual Discussion, User Requirements Capture Questionnaire (2)
Send to:
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Introduction:

Dear WSC 6 Member,

This questionnaire provides the basis for identification of the user requirements you would require when participating in a virtual discussion. It also identifies the experiences you had when participating in the conference. The results obtained from this questionnaire will be employed to define more focused targets for improvement of virtual discussion.

Definitions:

Virtual Discussion: Asynchronous environments were the knowledge transfer and interaction is achieved by the posting of text messages into a web environment. (Discussion Forum)

Virtual Conference: An environment no different to that of a real conference except that the WWW is used as the communication tool. (Can be an asynchronous or synchronous environment)

Please complete the questionnaire by writing your answers in the answer box provided. Additional space has been given for answers, at the end, should you need it.

An additional table at the end of some answer boxes has been incorporated. This is where we would like you to priorities your answers in terms of importance when participating in a virtual conference.
A scale of 1-5 has been used 1 meaning of low importance, 5 meaning of high importance when participating in a virtual conference.
Priority
1 low – 5 high

ANSWER BOX	3

We suggest that you answer all questions in the questionnaire first then go back and prioritise your answers.

This is due to answers being possibly left out of the questionnaire due to them being classified as of low importance.

CONFIDENTIAL QUESTIONNAIRE

The contact details and any addition information will only be used for the purpose of this questionnaire and to improve higher conference quality in the future should it be needed.

SECTION 1: CONTACT DETAILS

Please fill this section with your contact details.

Name:
Tel:
E-mail:

SECTION 2: THE CONFERENCE

Please indicate the extent to which you use the following.

	Y/N-NA	Extent of use, every day, once a week etc
World Wide Web		
Web conferencing		
Discussion forums		

Please indicate your role in WSC6 conference.

	Tick	Addition role details
Author		
Exhibitor		

Conference attendee		
Moderator		
Administrator		

SECTION 3: THE CONFERENCE

1. What features of the virtual conference did you think were of most importance?

	Tick
Secretary	
Opening Ceremony	
News	
Registration	
Awards	
Plenary Presentation	
Tutorials	
Certificates	
Virtual Exhibitions	
Social Programs	
Other: Please specify	

2. What features of the virtual conference do you think were of least importance?

	Tick
Secretary	
Opening Ceremony	
News	
Registration	
Awards	
Plenary Presentation	
Tutorials	
Certificates	
Virtual Exhibitions	

Social Programs	
Other: Please specify	

3. What extra features would you like to see incorporated in virtual discussion in the future?

	Tick		Priority 1 low – 5 high
Discussion forums			
Virtual Conferences			
Real time video streaming			
Real time audio			
Real time text messaging (IRC)			
White board sharing			
Application sharing			
Web tours			
Archiving			
Other: please specify			

4. How did you define the virtual conference a success?

	Priority 1 low – 5 high

Please use additional paper if required:

5. Did you experience any difficulties when participating in the conference with regard to:

Function	Y/N-NA	Please indicate why
Locating the Conference		
Registration		
Uploading Information		
Locating Relevant Information		
Participating in the discussion		
Notification of new postings		
Length of time conference was open.		
Other: please specify		

6. Have you participated in any other virtual conference?

Please indicate whether it was pre WSC6 or if it was an additional event.

	Tick
Yes	
No	

If answer yes to the above question please answer questions below.

Pre WSC6 Please indicate which WSC event	
Non WSC event Please indicate which event.	

7. During the conference period how much time did you allocate for participation?

8. During the conference how often did you log in?

9. What were your motivations for participating in the conference?

Please use additional paper if required:

10. Would you be prepared to pay for participation in the conference?
How much in Euro or US Dollors?

Please	tick	Amount
Yes		
No		

11. Did you feel a sense of community was created during the conference?
Please indicate why?

12. Have you created relations with people from the conference that you have not met in reality?

Please tick

Yes	
No	

13. Do you prefer attending a virtual conference rather then a real conference? Please indicate why?

Please use additional paper if required:

Thank you for contributing to this research

E-mail: d.j.ling.2001@cranfield.ac.uk

Decision Engineering Mission Members

Virtual Discussion, User Requirements Capture Questionnaire (1)

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Introduction:

Dear Decision Engineering Mission Member,

This questionnaire provides the basis for identification of the user requirements you require when participating in a virtual discussion. The results obtained from this questionnaire will be employed to define more focused targets for improvement of Decision Engineering Mission Member virtual discussion in high technology area.

Definitions:

Virtual Discussion: Asynchronous environments were the knowledge transfer and interaction is achieved by the posting of text messages into a web environment. (Discussion Forum)

Virtual Conference: An environment no different to that of a real conference except that the WWW is used as the communication tool. (Can be an asynchronous or synchronous environment)

Please complete the questionnaire by writing your answers in the answer box provided. Additional space has been given for answers, at the end, should you need it.

An additional table at the end of some answer boxes has been incorporated. This is where we would like you to priorities your answers in terms of importance when participating in a virtual conference.
A scale of 1-5 has been used 1 meaning of low importance, 5 meaning of high importance when participating in a virtual conference.

Priority

1 low – 5 high

ANSWER BOX	3

We suggest that you answer all questions in the questionnaire first then go back and prioritise your answers.

This is due to answers being possibly left out of the questionnaire due to them being classified as of low importance. **CONFIDENTIAL QUESTIONNAIRE**

SECTION 1: CONTACT DETAILS

Please fill this section with your contact details.

Name:

Address:

Postcode:

Tel:

Fax:

E-mail:

SECTION 3: VIRTUAL DISCUSSION

1. What are your primary goals from participating in the Decision Engineering Mission?

Priority

1 low – 5 high

Please use additional paper if required:

2. What are your primary goals from participating in a virtual discussion on decision engineering?

Priority

1 low – 5 high

Please use additional paper if required:

3. How would you class a virtual discussion a failure?

Please use additional paper if required:

3.1: Content

1. What topics of discussion are you interested in with regard to decision engineering?

Priority Tick	Area of interest		1 low – 5 high
Cost Engineering			
Cost Estimating			
Knowledge Capture and Reuse			
Intelligent System Application			

Other: Please state			

Please use additional paper if required:

2. What addition information would you like to access when participating in a discussion?

Priority
1 low – 5 high

Please use additional paper if required:

3.2: Features

1. What features / functions would you like to have when participating in a virtual discussion? What would you like to do? What would you like the software to do? Please indicate why.

Priority

Tick		**Why**	**1 low – 5 high**
Editing of messages			
Export message facilities			
Email notification of New postings			
Search message capabilities			
User interface in difference languages			
Customisable interface			

Language translator			
Other: **please specify**			

Please use additional paper if required:

2. Do you use any exiting software / tools that you would like to incorporate with a virtual discussion?

Priority

1 low – 5 high

Please use additional paper if required:

SECTION 4: VIRTUAL CONFERENCE

1. Which of the following would you like to incorporate in a virtual conference?

Priority

1 low – 5 high

Real time video streaming		
Real time audio		
Real time text messaging (IRC)		
White board sharing		
Application sharing		
Presentation slides		
Web tours		
Other: **please specify**		

Please use additional paper if required:

2. When participating in a virtual conference what file formats / data content would you want to upload?

	Priority 1 low – 5 high

Please use additional paper if required

3. During the participation of the discussion would you be willing to answer non-specific questions to the mission?

	Tick	Length of time
Yes		
No		

4. If answer yes to the above question (Q4) for what period of time?

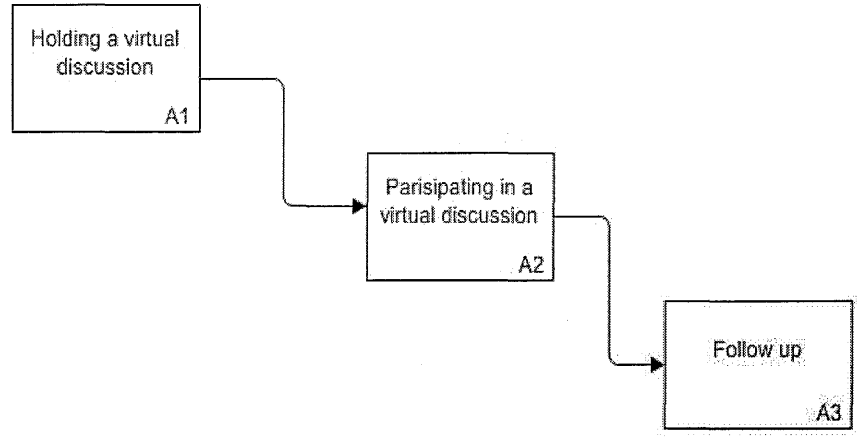
	Tick		
1 day			
1 week			
2 weeks			
1 month			
3 months			
6 months			
1 year			
Other: please specify			

Please use additional paper if required:

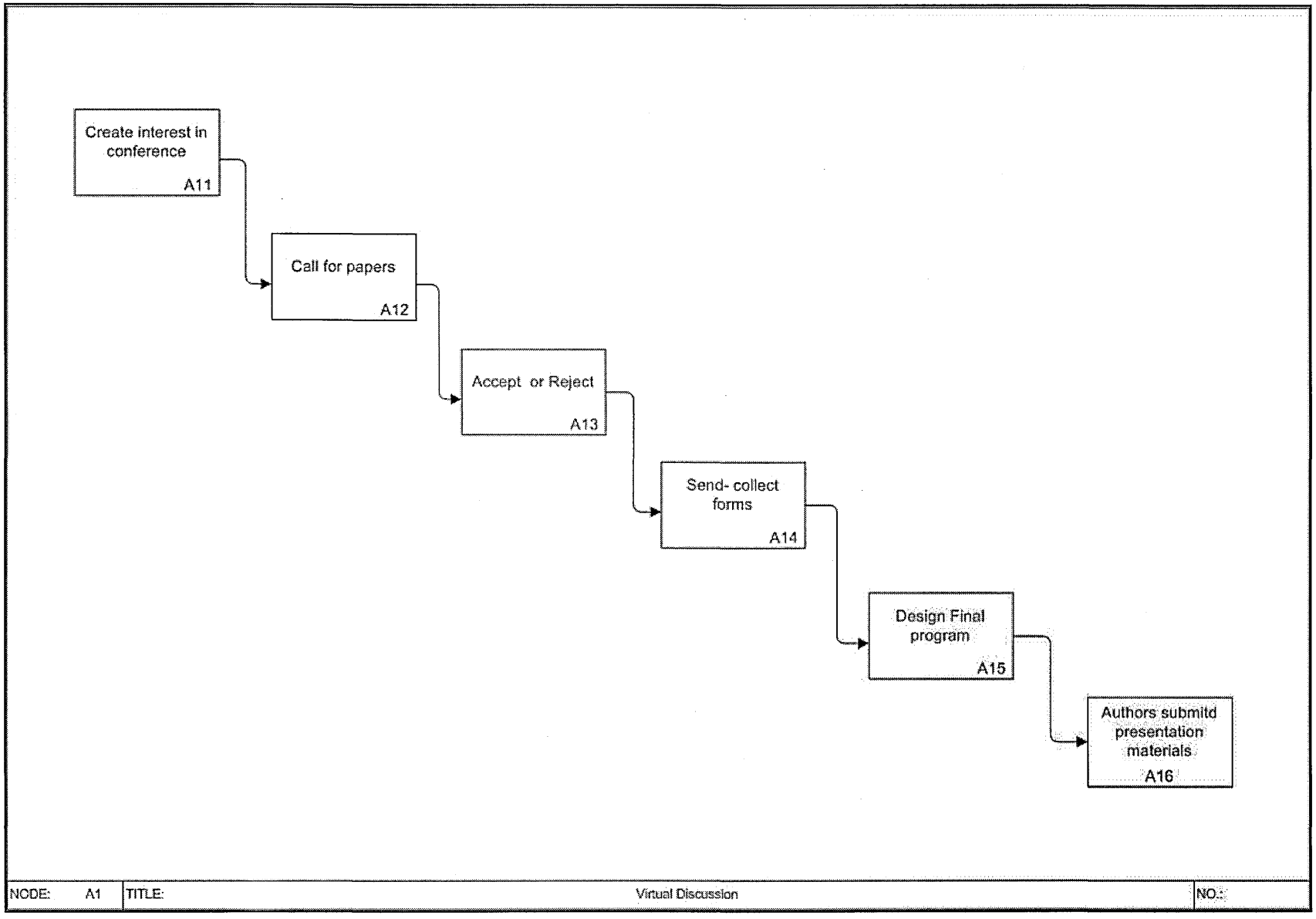
5. Would you be willing to be a moderator for a topic of interest during the discussion period? Please indicate the length of time available to be a moderator.

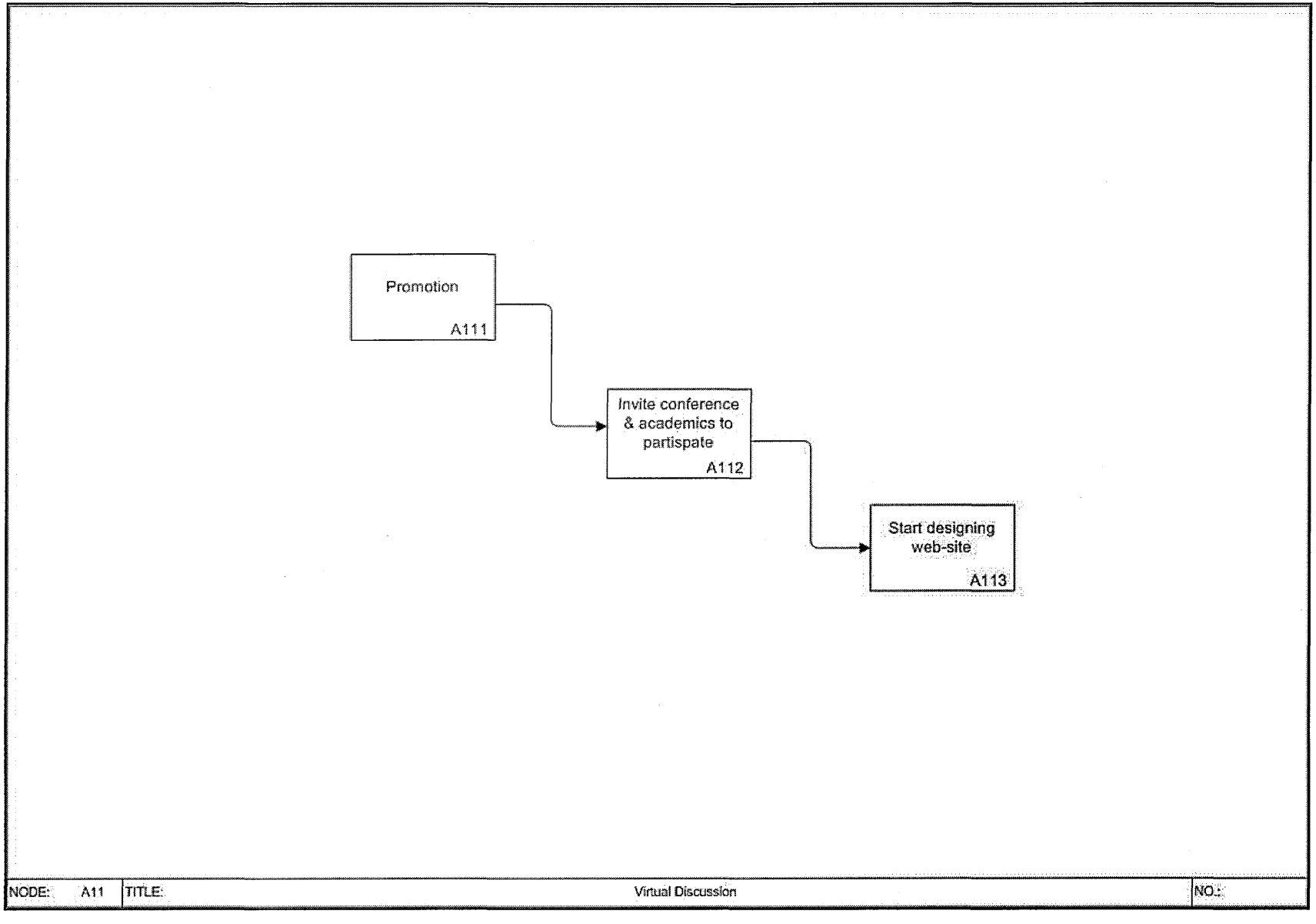
	Tick	Amount of time	Please Indicate Topic
Yes			
No			

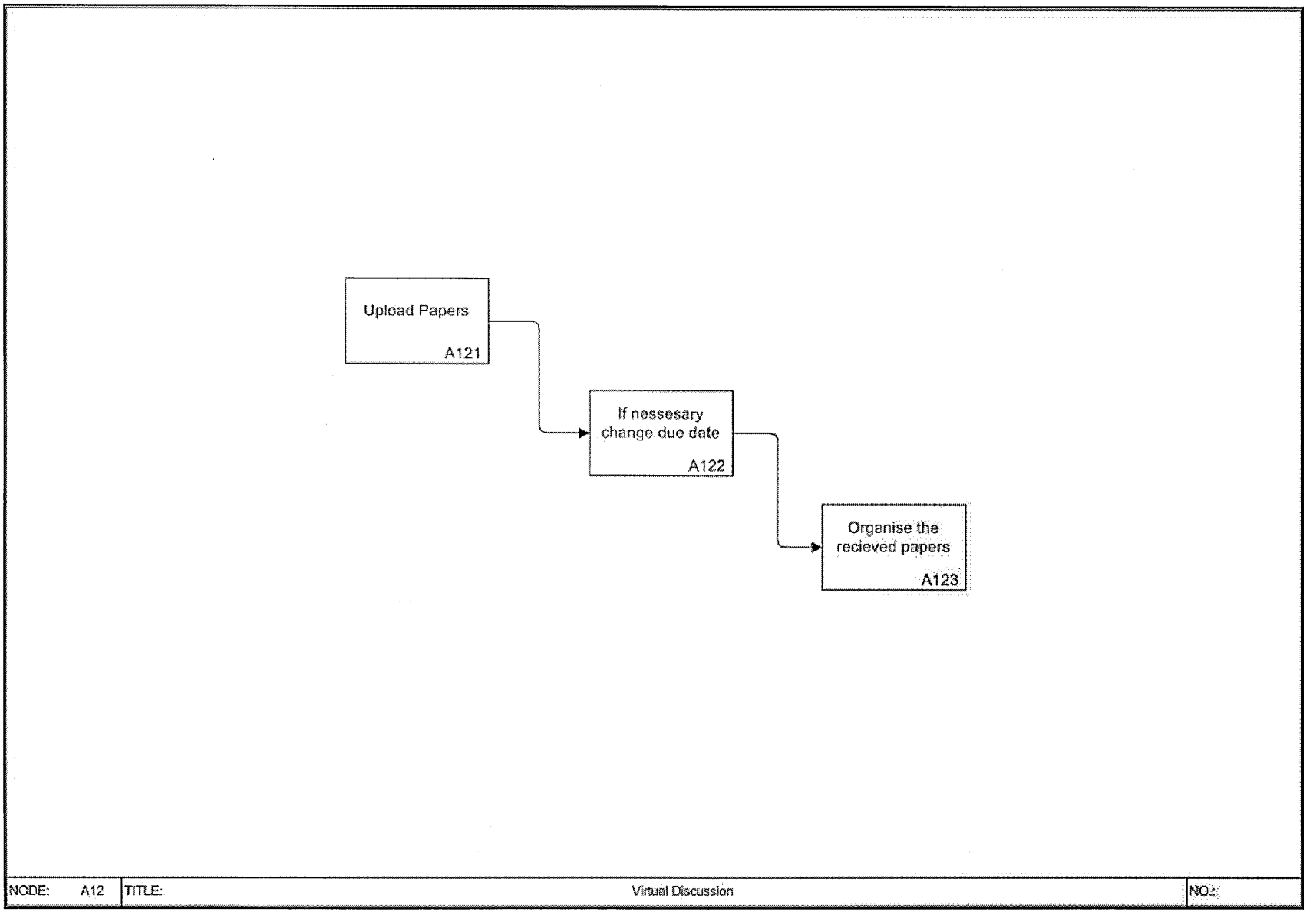
APPENDIX: C. Virtual Conference Process (idef0)

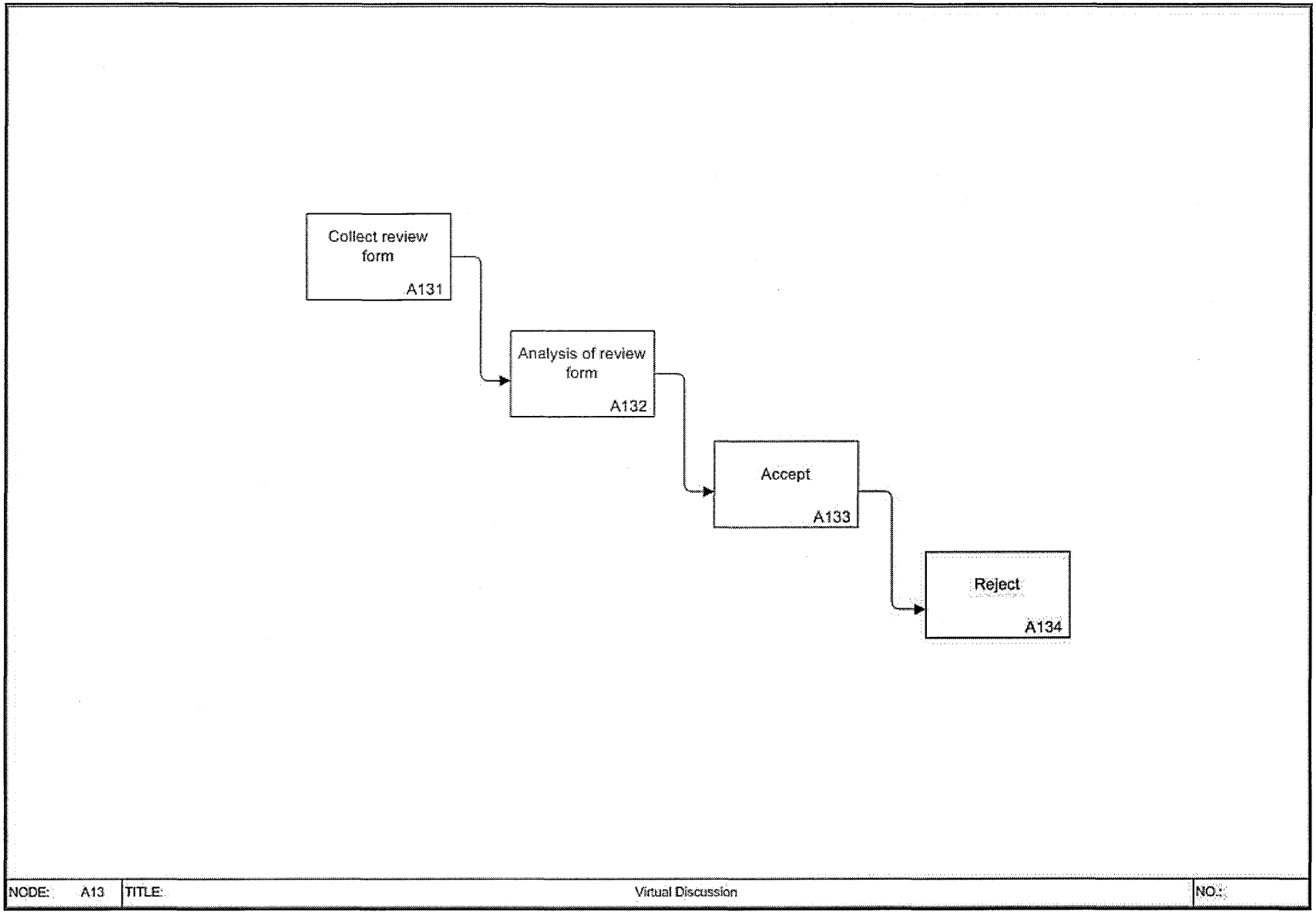


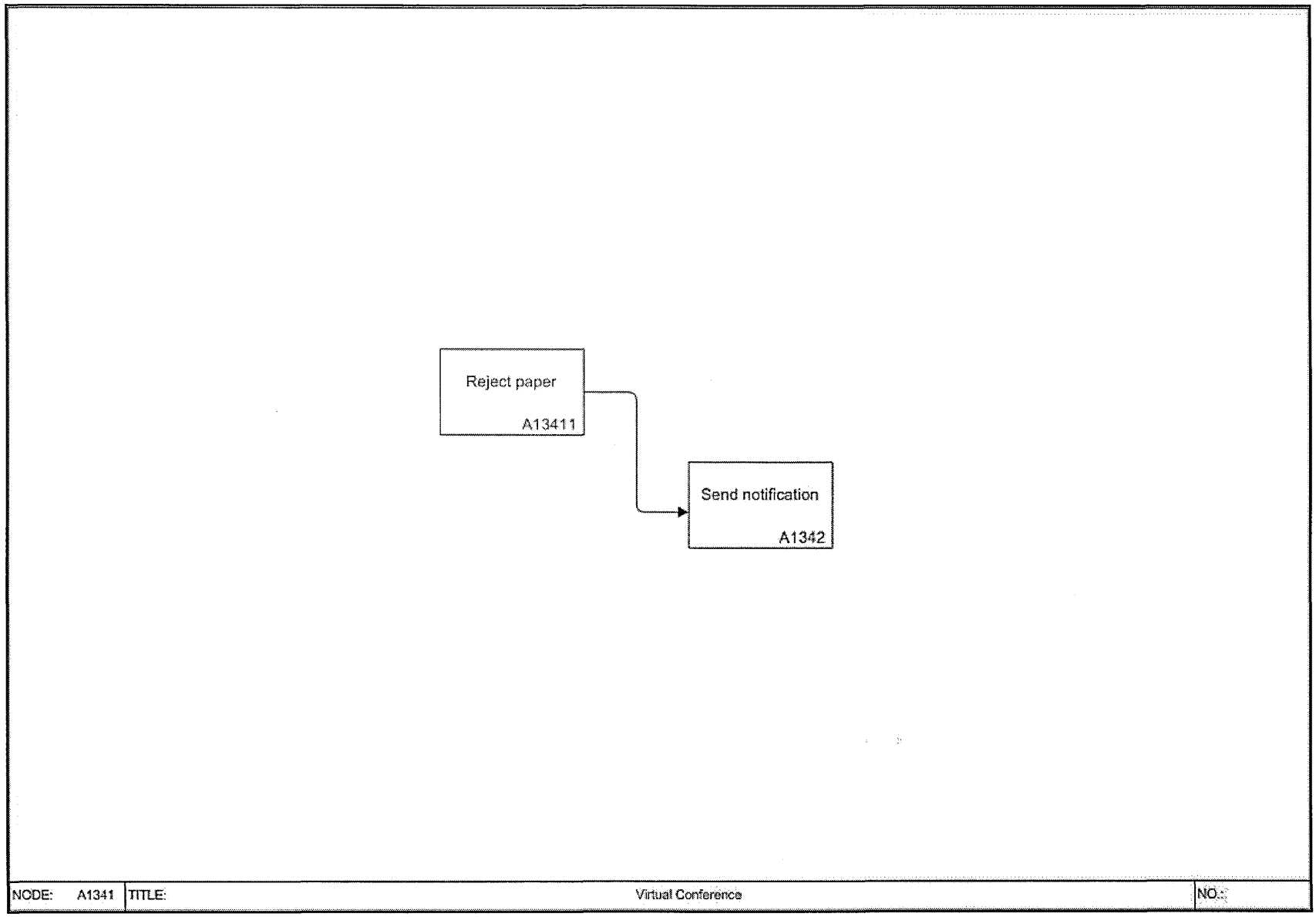
NODE: A0	TITLE: Virtual Discussion	NO.:

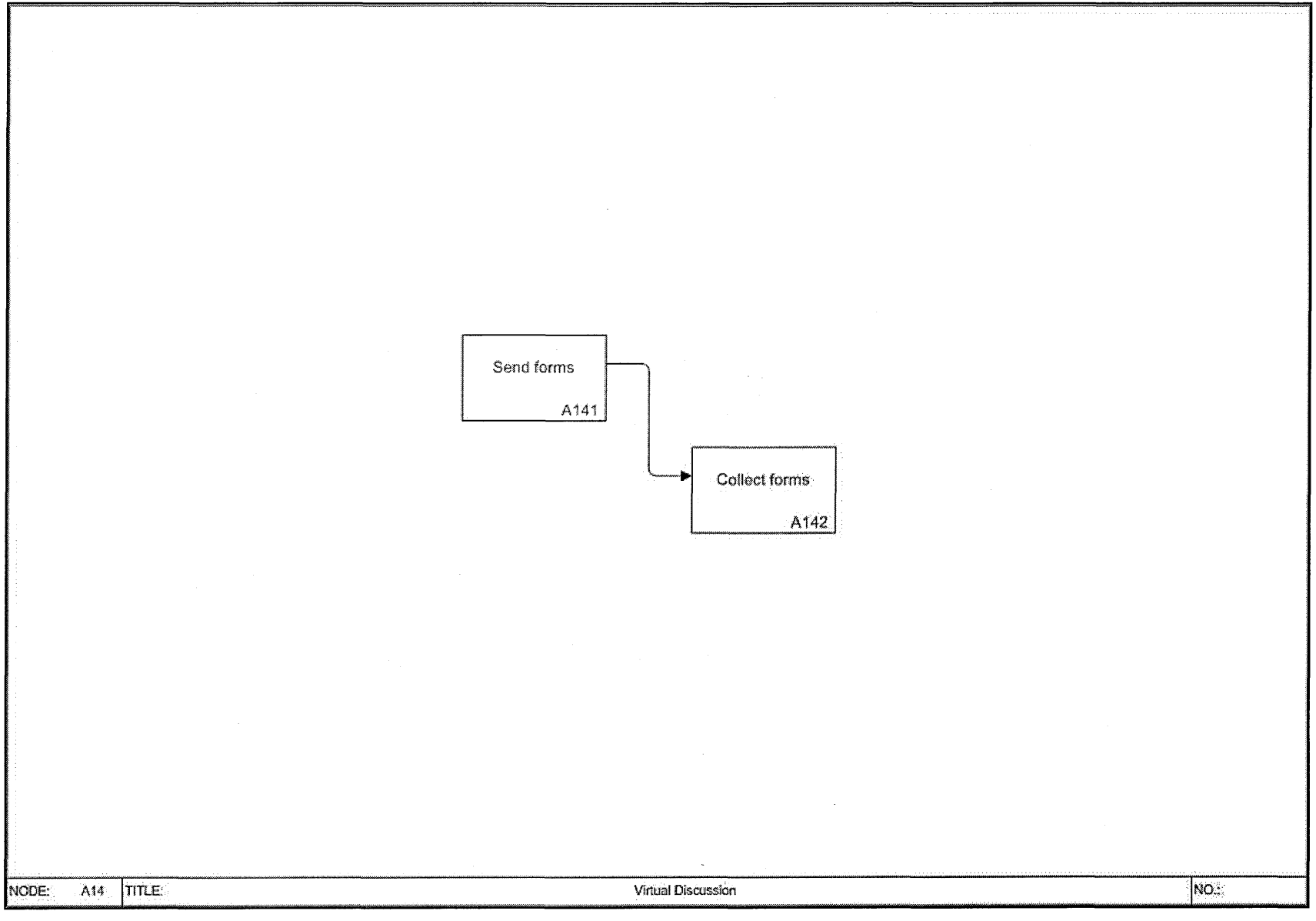

Create interest in conference
A11
Call for papers
A12
Accept or Reject
A13
Send- collect forms
A14
Design Final program
A15
Authors submitd presentation materials
A16
NODE: A1
TITLE:
Virtual Discussion
NO.:

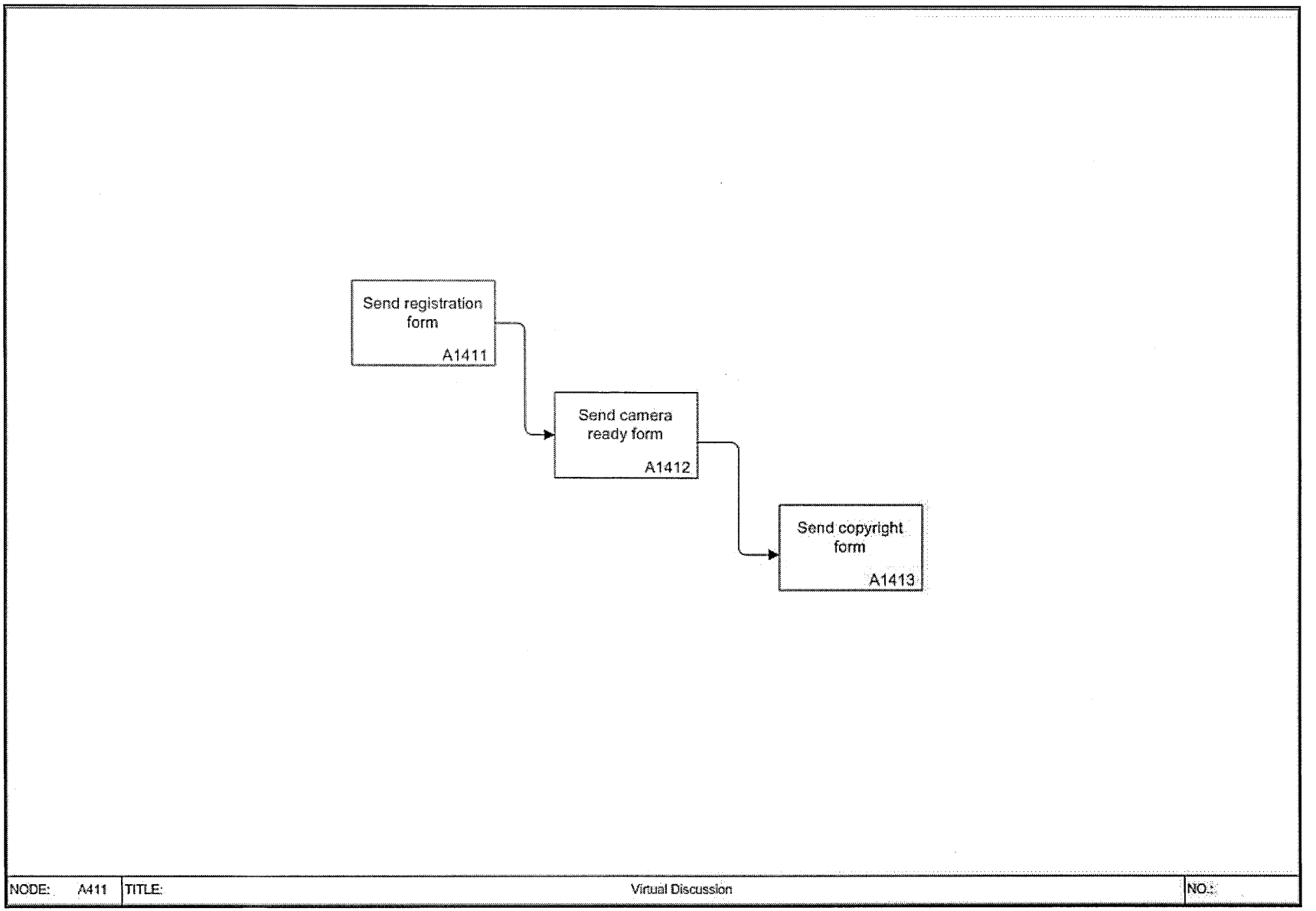

Promotion
A111
Invite conference & academics to partispate
A112
Start designing web-site
A113
NODE: A11
TITLE: Virtual Discussion
NO.:

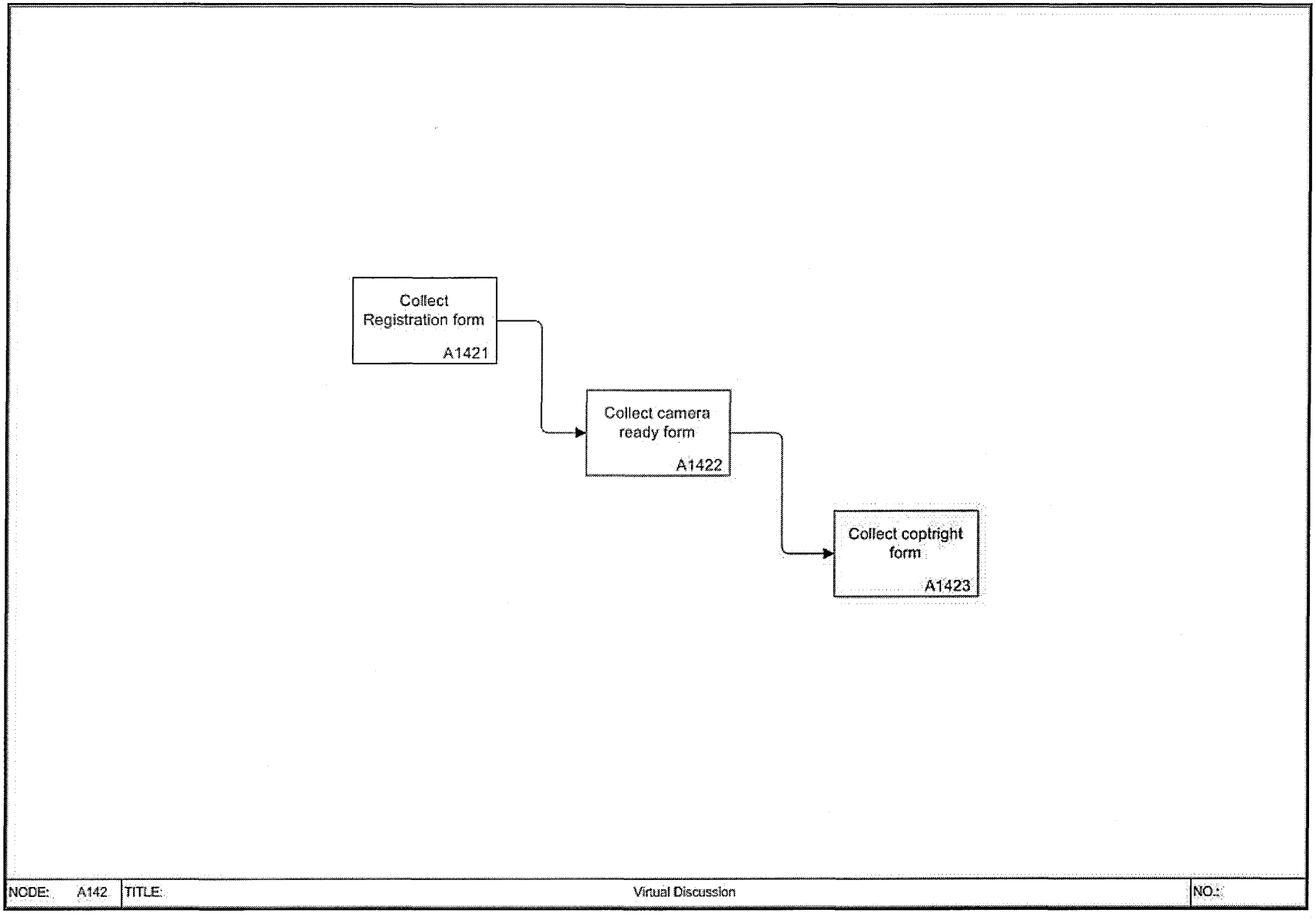

Upload Papers
A121
If nessesary change due date
A122
Organise the recieved papers
A123
NODE: A12
TITLE: Virtual Discussion
NO.:

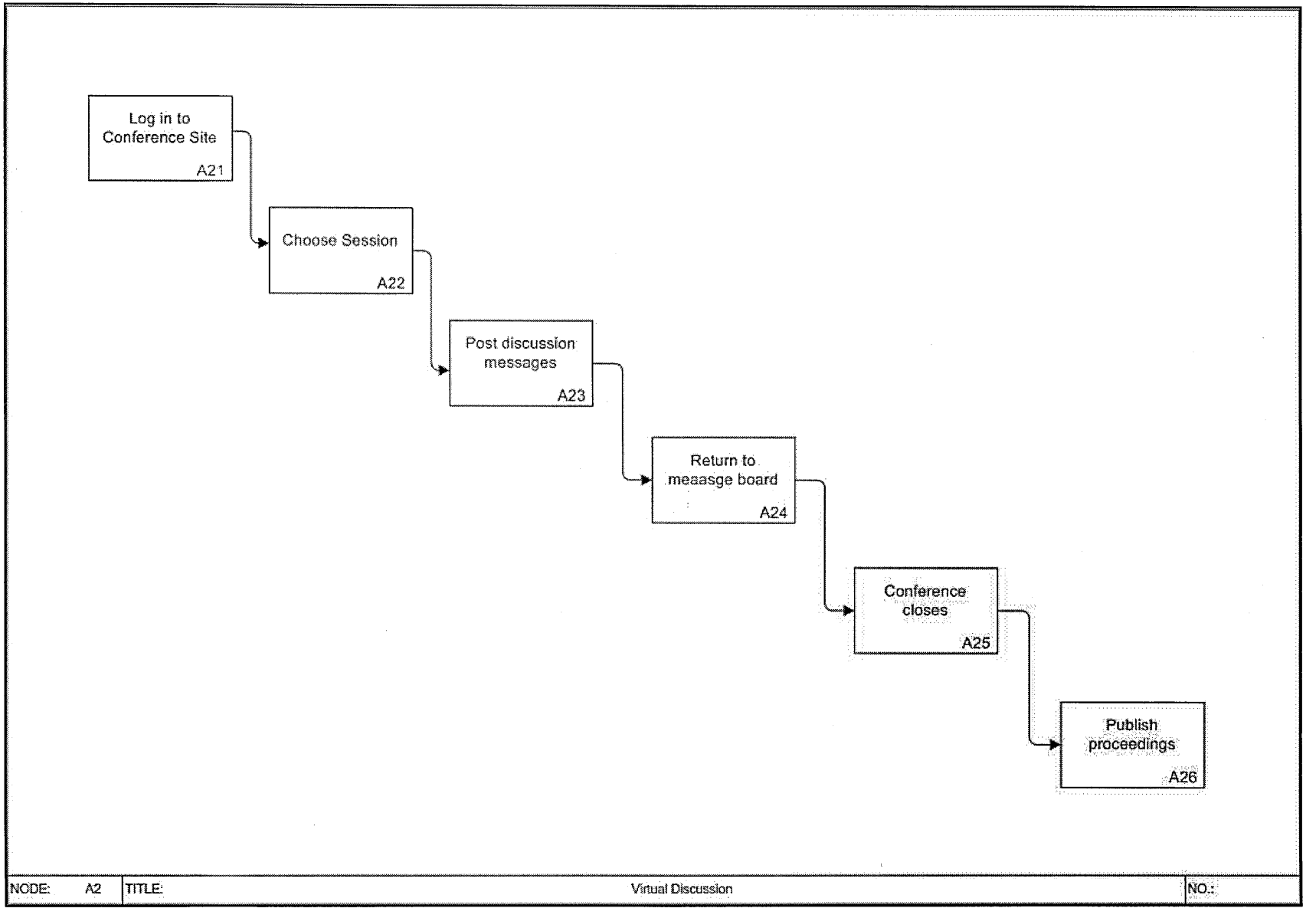

Collect review form
A131
Analysis of review form
A132
Accept
A133
Reject
A134
NODE: A13
TITLE: Virtual Discussion
NO.:

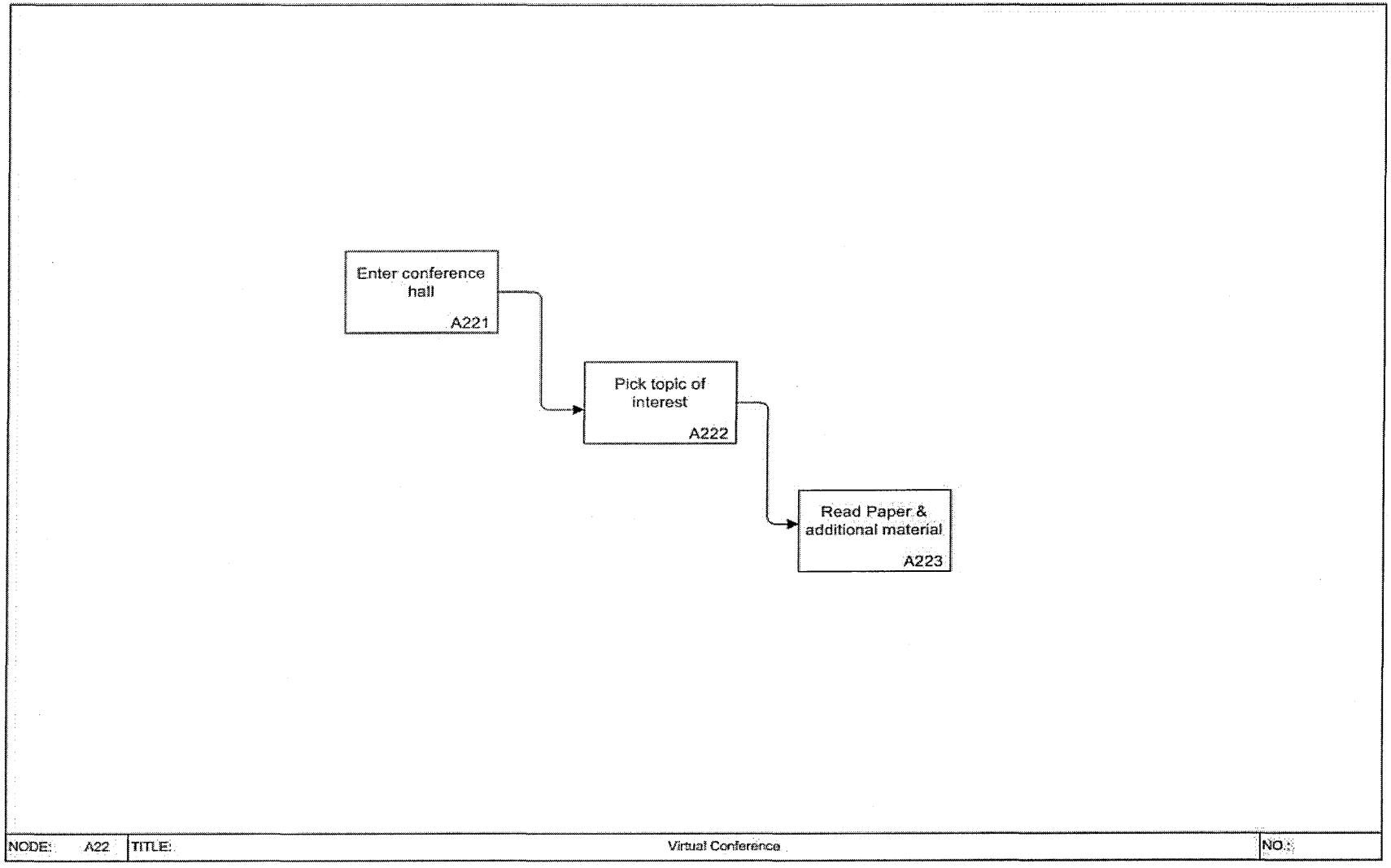

Reject paper
A13411
Send notification
A1342
NODE: A1341
TITLE:
Virtual Conference
NO.:


Send forms
A141
Collect forms
A142
NODE: A14
TITLE: Virtual Discussion
NO.:


Send registration form
A1411
Send camera ready form
A1412
Send copyright form
A1413
NODE: A411
TITLE:
Virtual Discussion
NO.:


Collect
Registration form
A1421
Collect camera
ready form
A1422
Collect coptright
form
A1423
NODE: A142
TITLE:
Virtual Discussion
NO.:


Log in to Conference Site
A21
Choose Session
A22
Post discussion messages
A23
Return to meaasge board
A24
Conference closes
A25
Publish proceedings
A26
NODE: A2
TITLE: Virtual Discussion
NO.:


Enter conference hall
A221
Pick topic of interest
A222
Read Paper & additional material
A223
NODE: A22
TITLE: Virtual Conference
NO.:

APPENDIX: D. Recommended Solution and Addition Feature Tables

RECOMONDATION TABLE CONCERNING DECISION ENGINNERING MEMBERS CLASSIFACTION OF VIRTUAL CONFERENCE A FAILURE AND ISSUES IDENTIFIED WITH PARTISPATION OF VIRTUAL CONFERENCE

COMPANY/PERSON	HOW DEMM CLASS VIRTUAL CONFERENCE A FAILURE	DIFFICULTIES IN PARTSIPATING IN VIRTUAL CONFERENCE	RECOMMENDED SOLUTIONS
Victor Taratoukhine (Cranfield)	Attendance very low. No novel discussion. Negative suggestions about VC content and environment.		Advertise and contact relevant people in the conference topic, have incentives such as free proceedings for the participation, (or the cost of the format.). Moderator will remove negative content. Moderator will also add postings if the attendee is low to encourage users to participate. Moderator will add own positive feedback
Roger Annett (Elbrus)	Attendance very low. Discussion does not develop a focus and maintain that focus with lively participation.		Moderator will email relevant people to participate in discussion when a posting has been posted in their registered topics of interest. Moderator must be committed during the conference and allocate time to the conference
B Azvine (BTExact)	Small number of participants, Vague and high level objectives,		Advertise and create interest in the conference. Create subtopics within areas of interest, which are closely linked to experts in that field. Place site into the search engine.
Gareth Evans	If number of users decreases over time, If information generated during discussion cannot be processed or summarised as to be useful at a later stage, If participants do not perceive it to be of value,		Publish proceedings. Send reminder emails to keep participation. Create new topics of discussion when a current topic seems to be loosing participation. The Moderator will contribute to the site to encourage participation and to show that there is interest in the conference.
Paper(		There is no instant information benefit to reply or post a message.	Incentives such as free proceedings. Dedicate time each day to participate in the conference. Track attendance to allow for allocation of incentives. Have a ranking system the more you contribute the higher in the ranking you become. The highest equals expert in the topic of interest. Allowing the user to engage in personal achievement.

A.B.Patki (WSC6)		Net users participating in it rather than just accessing the paper for downloading. That people do not actively engage in the WEB Conferencing. They tell their juniors to down load the papers of interest and there it ends. So much so that even the Programme chairman and organisers are also not interested. Most of my colleagues refused to even register subsequently, no to talk of sending papers, tutorials, panel discussions and referring etc. THE ORGANIZERS DID NOT SEND THE COPY OF PROCEEDINGS TO THE AUTHORS AND MADE IT A PRICE DOCUMENT.	Link paper downloads to discussion, reminder email to post views of downloaded papers. Download one paper at a time. Addition papers when you have contributed to the forum. Restrict access to people who do not contribute to the discussion. Send copy of proceedings. People have to be interested in the topics and this will lead to natural participation.

RECOMMENDATION TABLE CONCERNING THE SOLUTION THE ACHEIVEING THE DECISION ENGINEERING GOALS

COMAPANY/PERSON	PRIMARY GOALS FOR PARTISIPATION IN DECSION ENGINEERING	PRIMARY GOALS FOR PARTISIPATION IN VIRTUAL CONFERENCE IN DECSION ENGINEERING	CLASS VIRTUAL CONFERENCE A SUCCESS	RECOMMENDED SOLUTIONS
		Find a way forward for decimation of results form DE Mission	Positive feedback from participants Suggestions on the way forward about DE in industry	Create interest, Advertise creates awareness of VC, and identify the key people, Site links to Decision Engineering information and the companies participating.
Roger Annett (Elbrus)	Visiting and networking Industry base of Russia, Develop relations and work with technology Transfer department of DTI	Networking of contacts in the industry and research base of UK	People turn up to take part in the discussion, the discussion develops a focus.	Show contact details of industry research base of the Decision Engineering Members, Topics and subtopics will create a focus. Lead management within the site. (NetMeeting, simple email,)
B Azvine (BTExact)	Assess the status of IT in Russia, Investigate possibly of collaboration with Russian Companies	Networking with other UK and Russian companies interested in DE technology, Form closer ties with Russian IT companies, Understand more about mutual working models	NA	Publish contact information of participating UK and Russian companies to registered users. Create an area of the conference that can be used to have one to one contacts. Areas for posting models and for sharing information.
Gareth Evans	Learn about DE, Assess opportunities for technology transfer in UK railways, Learn more about the process of preparing for and arranging this type of business visit to Russia	Develop links with mission members, To provide advice to other UK companies wishing to interact with Russian companies, Develop stronger links to companies/ universities associated with railway technology in Russia.	NA	Publish company information, links to company sites, Lead management

Nigel Buttrick AcosE	Promote ACostE, Establish a level of interest ion Cost Engineering in Russia, Achieve objectives of Mission	See if it works, Support the Mission Objectives, Promote ACostE and increase awareness and members.	NA	Link to ACostE site.

DECISION ENGINEERING MISSION MEMBER ADDIRION FEATURES AND REQUIREMENTS

Areas of Interest	Addition Information would like to access when participating in the discussion	Addition Features. Functions	Existing tools like to incorporate with virtual discussion
Aerospace Design and Concurrent Engineering	Mission Information, List of Companies Visited, CVs of DE mission participants.	Editing of messages, User interface in different languages, Language translator,	NA
NA	Web search facilities	Email notification of new posting , User interface in different languages, language translator	MS Outlook and Outlook Express, IE
NA	DTI initiatives for international company collaboration	Editing of messages, Export message facilities, search message capabilities,	NetMeeting
NA	Links to related web sites or resources e.g. research into DE at Cranfield, web of ACostE.	Email notification of new posting , Search message capabilities, User interface in different languages, language translator	NA
NA	NA	NA	NA