Trials and product data

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No of pages: 9

Synopsis: This document records the results of trials and product opportunities for use in the ACTSLINE project

<table>
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<th>Project running trial?</th>
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</thead>
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<tr>
<td>Name</td>
</tr>
<tr>
<td>RENAISSANCE - Integration of High Performance Services for Interactive Vocational Training for European Regeneration</td>
</tr>
<tr>
<td>ACTS number</td>
</tr>
<tr>
<td>AC100</td>
</tr>
<tr>
<td>Name of trial?</td>
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<tr>
<td>Demonstrator testing</td>
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</table>

This report contains:

- Trials data ✓
- Product data ■

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Change History

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<th>Issue</th>
<th>Date</th>
<th>Reason</th>
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<tr>
<td>1a</td>
<td>23/3/99</td>
<td>First draft</td>
</tr>
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</table>
1 Basic information on the trial

Project running trial?

Name

RENASSANCE

ACTS number

AC100

Name of trial?

Demonstrator testing

How was this data collected?

From published literature ✓

Date trial visited or date of publication of results used?

17 June 1998

2 Location(s) of trial?

Location(s) visited?

Which companies\(^1\) took part in the trial?

North West Labs (IRL)
University College Dublin (IRL)
Sheffield Hallam University (UK)
Newark and Sherwood College (UK)
The Sheffield College (UK)
University of Naples (I)
The Sound Training Centre (IRL)
University of the Aegean (GR)
Jazz und Rock Schule (D)

Which company provided the information in this record?

Fretwell-Downing Data Systems Ltd

Which countries took part in the trial?

Ireland, UK, Italy, Greece, Germany

3 Classification

3.1 Constituency

Education ✓

SMEs ✓

Network operators ✓

\(^1\) In this template, “companies” includes other organisations such as universities etc
3.2 Domain

High speed networking

3.3 Geographical region

North Europe

South Europe

4 Description of the main focus of trial

4.1 Content provision

The central aim of the RENAISSANCE project was to demonstrate the capabilities of high performance broadband digital networks in the context of vocational training. The construction of a Learning Environment capable of delivering long distance virtual vocational training and of effectively managing the learning process was the foundation for achieving this goal. The selection of suitable examples to test the environment played an important part. The training materials of the Networking and Music industries met this requirement, both in terms of their widespread appeal and the development tools used in their construction.

Local trials were planned at the Jazz Und Rock Schule, Sheffield Hallam University, The Sheffield College, University of the Aegean and University of Naples.

Remote trials were planned at Sheffield Hallam University and The Sheffield College.

Training modules were delivered in English, Italian, German and Greek. There was a mixture of modules authored and delivered in the original language as well as modules delivered after translated in another language. In the latter case, the questionnaires used were translated as well.

Some examples of modules developed and delivered and their associated tasks follows below:

Module Name: Information Technology (Level 3)

The module made use of multimedia designed during the Renaissance Project called ‘Basic Spreadsheet’. To test students understanding a short assignment activity was set up called ‘Assignment 1-Budgets’.

Module Name: How to find Posh Spice’s Telephone Number

Spain, Portugal, Italy, Greece
The module was designed to give students experience of navigating their way around the site to find different digits of a phone number contained in different documents.

Module Name: Communications and Information Technology (Level 2)

The module made use of multimedia designed during the Renaissance Project called 'Networking' to give students the opportunity to provide evidence of their knowledge of computer networks and, in particular, of network topologies.

The student was expected to: study the networking learning materials; extract information relating to network topologies in terms of structure and benefits; produce a brief report on features and advantages/disadvantages of two type of topologies.

4.2 Network/Service Interoperability

The trials were designed to test the feasibility of managing a multi-media learning environment over a set of heterogeneous networks (including public networks and LANs).

5 Description of trial

5.1 Scenario (locations, connectivity, network configuration(s), ...)

The RENAISSANCE trial used a Learning Environment that was either delivered over a remote network or over a local network.

5.1.1 The Remote Configurations

Remote tests were carried out over both ATM and ISDN. The configurations of such tests are explained below.

Remote ATM Configurations

Of the two planned ATM-based remote tests, only the one between University College Dublin (UCS) and Sheffield Hallam University (SHU) was successfully realised. The second planned connection between University of Napoli (UoN) and UCD was never made available by the JAMES Project.

Remote ATM Configuration between UCD and SHU

Trials were carried out interconnecting the networks of University College Dublin (UCD) and Sheffield Hallam University.

At UCD, Figure 3.1, the Renaissance local network infrastructure was composed of a cluster of workstations, connected to both the 802.3 Campus LAN and to a FORE ASX-200 based ATM LAN.

UCD had a 34 Mb/s link to James via the Telecom Eireann (PRIME) operator. A permanent virtual path was set for Renaissance with a (duplex) bandwidth which amounted to 4.2 Mb/s. Two different flavours of IP over ATM were used: CLIP (Classical IP over ATM) was used within UCD and LLC/SNAP (Logical Link Control/SubNetwork Access Protocol) was instead
used to connect to JAMES.

At the other end in Sheffield the Renaissance local network was a 10 Mb/s Ethernet. The Ethernet LAN was then connected, via a 10 Mb/s link to the Campus ATM backbone running LANE (LAN Emulation) and then to the SMDS service through a CISCO router. The connection to JAMES was provided by the British Telecom operator via an ATM/SMDS router in London.

Figure 1 shows the UCD/SHU link details giving a net overview of the overall network infrastructure that was used for the trials.

Other sites found themselves in the same situation of not having a dedicated network for the trials and having to use the existing university networks appropriately adapted for the trials.

**Remote ISDN Configurations**

Two remote ISDN Configurations were used: between SHU to TSC and NWL to STC.

**Remote ISDN Configuration between SHU and TSC**

In this test configuration an ISDN connection was established between SHU (server site) and TSC (distribution site). Both institutions are using their internal campus LANs and IP routers to link their sites to the ISDN connection.

**Remote ISDN Configuration between NWL and STC**

In this test configuration an ISDN connection was established between NWL (server site) and STC (distribution site). The configuration of the connection was a simple point-to-point link between the server machine in NWL and the distribution machine in STC.
5.1.2 The Local Configurations

There were 5 sites where local networks were used to support the Renaissance learning Environment and to carry out network measurements:

University College Dublin
– which has already been described

North West Labs
Here the Renaissance local network infrastructure consisted of a cluster of workstations connected to an ATM LAN, integrated. Additional devices allowed internetworking with a CATV infrastructure.

Sheffield Hallam University
– which has been already described.

University of Napoli Federico II
The network architecture here was designed to allow the interconnection of existing local area networks to similar facilities available remotely. The wide area interconnection of the sites was achieved via a broadband, ATM-based network infrastructure provided by the SIRIUS Project.

The internal network infrastructure of this laboratory is based on a separate 802.3 cabling, and several experimental LANs based on FDDI, ATM and Myrinet technologies.

S-JAMES: the University of Napoli ATM Testbed
The project was not able to use the JAMES connections that had been planned for pan-European trials. In its place, RENAISSANCE created a laboratory set-up to validate and analyse locally possible network interconnections in a realistic environment. This was known as S-JAMES, a laboratory testbed that included a similar internetworking scheme between local network infrastructures and an ATM connection.

The S-JAMES testbed was used to evaluate the effect of different configurations of the wide area network connections on the quality of service perceived by the LE users. In particular, attention was paid to the impact of the available bandwidth and the use different services like Classical IP and the different ATM service classes.

5.1.3 Learning Environment trials

The remote trials between UCD and SHU were used to establish the level of usability of the Learning Environment (both in terms of user friendliness and effectiveness in delivering multimedia learning material), and to study the implications of using heterogeneous broadband technologies for distance learning and vocational training. Two tasks, within the Learning Environment, were designed to test the above points, and they were called task A and task B.

For the first task, task A, users were involved in a treasure-hunt trying to find out a hidden phone number. The digits of the phone number were scattered around and stored in web pages and word documents and users had to go through all the learning resources to find all the digits to fulfil the
By pursuing task A, users would have accessed web pages and word documents through the Learning Environment (LE) which served as the launching point and was meant to assist the users throughout the learning process.

Task B was instead based on interactive multimedia learning material designed by the Sound Training Centre (STC) in Dublin using the Macromedia Shockwave authoring tool. The application was called Audiolab and was part of the learning material developed for the music industry vocational training. It featured an interactive multimedia user interface by means of which users could navigate within it and explore all the learning material, mostly made of multimedia AVI files. For this task, users were presented, through the Learning Environment, with a word document containing a questionnaire to be filled in. All the questions were based on the content of the multimedia learning material that users were supposed to be viewing by launching Audiolab from within the Learning Environment.

As well as a general description of the trial, the following specific questions need to be answered:

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did the trial use existing networks? (which ones?)</td>
<td>Yes – a mixture of public networks and LANs</td>
</tr>
<tr>
<td>Did it use network facilities from another trial? (which one?)</td>
<td>JAMES</td>
</tr>
<tr>
<td>Was a network created for this trial?</td>
<td>Networks were interconnected for this trial</td>
</tr>
<tr>
<td>Was the terminal equipment built for the trial or is it commercially available?</td>
<td>Commercially available</td>
</tr>
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</table>

5.2 Users

- Were “real” users on the trial or was it an artificial set of users (e.g., employees of the companies taking part)?
  - Real students and tutors were involved

- How many users were involved?
  - Not known

- How much training did the users need to take part in the trial?
  - Very little

- How much use did the users make of the trial (this needs to be given in absolute terms – e.g., 3 days each – and as a figure indicating when they used alternative methods to the trial)?
  - Not known

5.3 Operation

- Was the trial operated by normal operational staff (e.g., the network operator’s field technicians) or by staff normally used for research & development work?
  - Operated by staff associated with project. Although the networks were generally run by their normal staff.
5.4 **Charging**

Were users charged for using the trial?  
No

5.5 **Relationship with any other trial.**

Which ones?  
None (apart from JAMES)

5.6 **What is the particular feature of this trial which distinguishes it from the others?**

The RENAISSANCE project has developed a virtual vocational training environment which can manage and deliver advanced digital content thereby demonstrating the capability of a range of high performance network infrastructures to support such an application – namely Community Antenna Television (CATV), Asynchronous Transfer Mode (ATM), Integrated Services Digital Network (N-ISDN), Ethernet and Fast Ethernet

6 **Main results from the trial**

6.1 **Reaction from the users**

What percentage of users gave up before the end of the trial?  
Not known

What was the reaction of the users to the trial?  
User reaction was assessed by questionnaires and activity logs. The reactions varied depending on, eg, the experience of the users and the task they were undertaking.

What user benefits were shown by the trial?  
The ability to remotely access learning material has been demonstrated.

What user issues were highlighted by the trial? Were these solved?  
Overall, the system seems to be better suited to more highly qualified students or their attitude to the system is more positive. There is also a pattern evident that the under 18s are consistently more positive than the 30 to 40 age group with the other categories.

The method of delivery which was perceived as better in all categories by the users was the local delivery. However, it must be remembered that the remote trials
samples were very small in comparison and so extreme values will have more influence. Also, the local trials, as it was possible to run them earlier, were part of the users’ learning experience much more than the remote trials, which were run later in the student year. This may also affect their perception.

6.2 **Charging**

Did the trial show how sensitive users were to price?

| No |

6.3 **Operation**

What operational issues were shown up by the trial (eg did the equipment fail in cold or wet weather)? Were these solved?

| None |

6.4 **Design**

What design issues have been highlighted by the trial?

| Not known |

7 **Recommendations (from the project running the trial)**

7.1 **Lessons learnt**

Describe:

- The network infrastructure needed to support a remote multimedia learning environment at a realistic cost is not yet available in Europe.
- It is better to develop small relevant pieces of work that fit in with the teaching and curriculum as supporting material so that they can be integrated and relevant. This is opposed to developing larger self-standing works that take too long to ‘bring to market’.

8 **References**

References out to published results from trial (eg Websites, conference papers):

- Project deliverable D1102: Final Results of Demonstrator Testing
- [http://www.syspace.co.uk/renaissance/AC100/INDEX.HTM](http://www.syspace.co.uk/renaissance/AC100/INDEX.HTM) – project home page