User-driven Applications of Advanced Networks for Electronic Marketing of Tourism Products

Existing trading relationships and service provision within the tourism sector are undergoing rapid change with the development of new networks and services. The new networks are opening up possibilities for expanding the range and quality of trading relationships particularly for SMEs. This article will illustrate this with a series of user-driven projects which are providing electronic market places at national, European and world levels and which are investigating cost-effective integrations of narrow-band and broadband services.

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From a network operator's perspective, the tourism sector appears to have a very large potential as a generator of usage of networks and value added services. Typically, the products need to be viewed and booked at a distance and the products are natural candidates for multimedia descriptions. In addition, the gross output of the sector is enormous (WTTC 1992 Report: tourism accounts for 6% of world GNP, with 935 million international travellers by 2010). Some of this potential has been released via on-line distribution and booking of mass market packages from major tour operators to travel agencies and business travel. However, the release of most of the potential depends upon bridging the international trading gap between points-of-offer, travel agencies, and independent travellers in a cost effective way .

A review of Point-of-offer (PoO) businesses in the TIM project revealed their need to control their own product development and marketing strategies and also that this need is not satisfied by brochure production and distribution or via the mechanisms employed by the large tour operators. The key elements to their requirements are individual control by PoO of product descriptions, information update schedules, and commercial negotiations, direct access to points-of-sale, and feedback on the effectiveness of their marketing investments. In this context PoO includes; local/regional tourist boards, local tour organisers, event organisers, activity venues, places of interest, food and drink venues, and shopping, in short, most of the reasons for going on holiday and requiring transport and accommodation. Accommodation is also included as a PoO type, most of which is also SME-based (73% of rooms in Germany, for example).

Travel agency requirements include the enhancement of their capacity to add value to the products they sell. This requirement is reinforced by the prospect of carving out a role as a tourism service provider within home shopping systems. A value-added role requires direct access to a product resource, e.g that provided by the PoO, which can then be used to generate a reliable and easily bookable product range suitable for independent travellers. However, adding value should not be accompanied by large increases in training costs, staff time per customer, and difficulties in turning the added value into revenue. The product resource should be up to date and easily accessed. It is difficult to estimate the potential number of PoO participants who would engage in direct marketing, but an estimate, based for example on the number of those organisations which currently pay subscriptions to local tourist boards, is 3 million world wide who will be independently creating and updating product information. Clearly the marketing mechanism must be one which automatically integrates product information, otherwise access to this resource is impossible. This is obviously also the case for travellers who might want direct access to this resource themselves.

The solution to these needs is an open international electronic market place. The next sections will describe a series of projects which are examining a variety of communication technologies for a cost-effective implementation of this market place.

The TIM Project - European Marketing via ISDN

The TIM project (RACE 2078, April 1992 - July 1995) developed a prototype electronic market place. The users of the market place are of 3 general types, holiday makers, travel agents, and PoO for products such as accommodation, cultural events and sports activities. The market place was designed to enable direct trading between small suppliers, travel agencies, and independent travellers. TIM conducted trials of the market place across 9 European countries, using primarily ISDN international networks. The facilities of the market place provide:

1. Support for final customers to browse through a rich variety of product offers in order to make provisional holiday travel choices and plans suited to their specific requirements. The focus is thus on independent travellers and dynamic packages.
2. Support for the following 4 basic processes at points-of-sale (PoS): Identification of the products that are available from initial, approximate queries. Retrieval and display of multimedia information for any products selected for further information. Creation of a specific package from any number of elements of events, activities, accomodation, travel, from different suppliers. Checking for the availability of each of the package elements and the booking of each of those finally allocated.
3. Support for the following 4 basic processes at points-of-offer (PoO): Definition of each product that is to be promoted. Creation of multimedia information to differentiate and promote each product. Distribution of product definitions and multimedia information to the market place. Monitoring of market place usage in order to improve marketing actions. The first process includes a requirement for users to introduce new product types onto the market place, whenever necessary. The system has been designed to enable small and medium-sized companies to directly market their products internationally to PoS.

In all three cases of support, the individual user will engage in the buying, selling and marketing processes, when, and with whom, they wish. This means that the services must be able to support many to many, user-driven, connections. In addition, there is no intermediary publisher, purchaser, wholesaler, and therefore the services must provide a continuous consolidation of market-place information. The consolidated product and marketing information, at any point in time, includes; 1) the types of product that can be placed on the market place, 2) the products on the market place, 3) the physical location of the multimedia files associated with each product, 4) a log of the actions of the users at each access point.

There are two main concepts for the application, corresponding to the activities of 'marketing', and 'selling'. For the marketing activities a concept is required for the 'multimedia marketing information' that the PoO will create. The traveller, and PoS require relatively standardized product definitions and presentations in order to browse and compare products. With traditional brochures and product presentations, document structures vary between tour operators. The user interfaces of on-line systems also are specific to the service provider. Even with a few 'wholesaler' tour operators this variety causes problems at PoS. With an open international market place, with

thousands of PoO, some standardisation is essential. From the PoS perspective all the information from the thousands of PoO should be searchable and viewable from within a single user interface. From a PoO perspective, multimedia information should be easy to create but most importantly it should satisfy marketing objectives such as product differentiation. In order to support these contrasting needs, the TIM project decided to use the concept of a 'folder'. The folder concept satisfies the PoO requirements for product differentiation in marketing and it is suitable for a relatively simple standardised approach for automatic consolidation and presentation of information for selling because it is product generic. A folder in TIM is similar to the normal paper folder concept. It is a container for information, which also has some information displayed on its front cover. When a folder is retrieved from the database the user is presented with the front cover. The front cover contains a picture (image or graphic design), some text, and a list of the contents of the folder. These contents can be text, picture, sound, and video, and can describe particular facilities e.g. the bedrooms, or a more complex 'slide show' presentation constructed by the PoO. The user is able to selectively view/listen to the contents, thus giving flexibility at PoS. The folder concept also enables more complex document structures to be automatically generated from the PoO's folders, for example, hypermedia documents based upon HTML, where this is required at PoS.

Concept

For the selling and booking activities, a concept is required for the creation of holiday/travel 'packages'. The packages need a structure which can be understood by the customer and which reveals logistic issues. Within the tourism sector the 'package' concept is familiar as a predefined wholesale product. In contrast, for TIM, a specific package is constructed with the customer by building a diary of product selections and transport arrangements based upon the information in the product folders. The facilites that are available to the users include:

1. Creation of folders (PoO):

Original material can be digitised and edited at every PoO using the multimedia editors. A folder is constructed, directly by PoO personnel, for each product using selections of multimedia material. A typical folder contains pictures, text, video, speech and sound, and can vary in size, for example, as small as 500Kbytes or, with the inclusion of a number of videos, 10 MBytes. The product must be defined by the PoO using attributes (standards) that will be used at PoS for searching the data base. Once a folder has been created, the pan-European database is updated with the new product definition so that a product search produces the same results at every market access point. The schedule of folder creation is specific to and controlled by each PoO user.

2. Distribution of folders (PoO):

The multimedia files associated with each folder can be distributed from the PoO author to specific market place locations which will minimise the cost/time of retrieval of multimedia for targeted customers at PoS. The location of the multimedia files is thus determined by the distribution and retrieval actions of users. The schedule of distribution of folder information is specific to and controlled by each PoO user.The distribution of folders can be over ATM, ISDN, and Internet

3. Viewing of folders (PoO & PoS):

Folders can be searched for by 'dropping down' through layers of maps, or by directly specifying the product type. When a list of products matching the user's query is displayed, the user merely has to click on selected products in order to view the multimedia information. If the multimedia files are not on a local server they are automatically retrieved over the network connecting the appropriate server to the user. This network can be ATM, ISDN, or Internet. An electronic note can be made of any product the viewer finds interesting. A Point-of-Information (PoI) service has also been developed which enables a user to access the TIM database as a WWW client over the Internet. This was used as a service to delegates at a major telecommunications conference in Vienna in November 1995 (National Hosts Conference).

4. Packaging (PoS):

A multi-vendor package of products can be constructed during the sales process from the available offers promoted by the folders. The package is structured as a diary. The electronic 'notepad' created under the Viewing Service is available for transferring offers directly to the diary. Each product can be checked for availability and booked via a variety of on-line reservation systems, but through one standard TIM booking interface.

5. Administration (PoO & PoS):

The market place needs to be flexible with respect to creation/amendment of product information but also with respect to addition of new product types. Services are therefore provided which enable users to amend the product definition standards such that new types of product can be introduced. This also includes amendment/introduction of new product locations including new maps.

Business Case Analysis for TIM

TIM had a strong focus on exploitation issues. The project began with an analysis of the businesses of the PoO and PoS partners, and after the system components were chosen a comparison was made of the costs of installation and operation of the system with existing business costs and revenues, for example, with the costs of brochure production. The solution for the market place system was essentially a distributed database with local database nodes at all PoO and PoS sites. Direct trading relationships were supported by local node to local node transmission of multimedia data. All the local databases were accessible from all TIM terminals. A global supervising node administered and monitored folder updates and system use. It did not act as a central store of the multimedia marketing data. The hardware for both the terminal, and local database nodes was 486 PC with the database running Microsoft SQL Server under Windows NT and the terminal Windows for Work Groups. The user had a choice of running the application on one or two machines (client and server). The objective was low and distributed costs for terminals and servers, and conformity with tourism sector developments. These costs were found to be acceptable, e.g. 1-2% of brochure production costs.

Also, a draft business plan for a service provider organisation was developed which assessed costs, likely tarifs and potential markets for a company which provides the essential features of a TIM service. These are: standards and procedures for trading, branding and marketing, common software interfaces (operating on a variety of customer-owned hardware platforms), supervising nodes which monitor and control all the functions upon which transactions are dependent (addresses, file locations, version control), and gateways to global and regional reservation systems. This plan concluded that there were a wide variety of applications for such a service and as an example quantified the P & L and cash flow for a TIM service provider operating in three niche markets: service to specialist travel agencies and their holiday vendors; and operation of in-store retail outlets and public information systems for tourist boards.

Even in this context of a limited number of users it was calculated that the TIM service provider would reach annual sales of 6 MECU within four years by which time it would be in profit and its cumulative cash flow would turn positive within five years.

SAMSON - Integrating Hypermedia with Established Services

The SAMSON project is funded 50% by Deutsche Telekom and is coordinated by its subsidiary DeTeBerkom, which is also prime contractor of TIM, MAT and SAM. Therefore, it is a member of a team of projects which are all focussed on the provision of an electronic market place for tourism. The specific objectives of SAMSON are to evaluate the integration of the market place with services currently being supplied by the major national service provider (START), to focus on a particular national market (Germany), and to investigate the usability of services for PoO which enable them to directly edit hypermedia (HTML) documents. The services developed by SAMSON are being integrated with those of SAM so that German users of SAMSON will be able to market their products world wide, and will be able to view and book products from around the world.

The points-of offer contribute their product definitions and multimedia descriptions via a Marketing Support Centre. An easy to use set of tools for HTML editing and product definition are currently being evaluated in trials. The SAMSON system provides access to the market place via the same terminals used in the travel agency to access the START services. The customer can choose their holiday options from the hypermedia product descriptions and then book these via the START services.

Storage of multimedia material is handled by a WWW-type server. Retrieval of information is coordinated by a relational database. Communication networks with standardised transmission protocols connect the marketing support center, the database and the terminals in the travel agencies with each other. Various bandwidths (from ISDN to interactive digital TV) provide different levels of quality. The first trials of SAMSON took place at the end of 1995 with 20 travel agencies in Berlin. During 1996 the system will be optimised and the user base will be increased with PoS locations in Frankfurt and Leipzig.

The MAT Project - European Marketing via ATM

The MAT project (B2008, September 1994 to September 1996) has taken the application developed in the TIM project and is conducting two sets of trials which are evaluating the use of international ATM services for the transfer of multimedia marketing information. The principal aim of the first set of trials (February to May 1995) was to establish the feasibility of the network and make technical performance measurements.The network consisted of a hybrid network of Ethernet LANs and ATM WANs. For comparison purposes, most sites also used ISDN connections, as shown in Figure 1.

Ten international ATM connections were evaluated. The trials consisted of tourism companies using the application, where distribution and retrieval actions invoked either ATM or ISDN for communication with remote servers with the only noticeable difference to the user being in quality of service. In total, more than 28 (half) days of testing were conducted between different sites. Folders with text, image and video were distributed and retrieved. The size of the folders was in the range from less than a Mbyte to 15 Mbytes.

The ATM services were provided by the ATM Pilot (a collaboration between European network operators). The peak rate provided by the ATM-Pilot was 5600 to 10000 cells/sec corresponding to 2.4 - 4 Mbit/sec. Although some tests achieved 1.3 Mbit/sec throughput, the average was about 800 Kbit/sec, or about 14 times faster than basic rate ISDN (the average transfer rate using ISDN was 57 Kbit/sec. (64 Kbit minus overhead)). On ISDN it took about 10 minutes to transfer a standard folder (3 MByte video, and 1 Mbyte pictures), while it took from 30 sec to 1 minute using ATM. The loss of throughput was primarily caused by overhead in converting IP packets to ATM cells. PoS users found that performance was satisfactory for all media types with ATM and Ethernet. For the other networks only text was considered appropriate for 'real time' retrieval.

In general, the first trials demonstrated the feasibility of the technical environment and an appropriate performance for the chosen IP over ATM solution. The objective of the second set of trials (March - May 1996) is to model the future relationships between users and service providers of the market place with commercially likely configurations of ATM, ISDN, and other networks.

In the immediate future it is not likely that all PoO and PoS users of the market place will have access to end-to-end ATM services from their place of work. How then should ATM be exploited in a commercially realistic way? The market place tasks of the users that are critical in this context are the distribution and retrieval of multimedia product information. Since the users who trade with each other are scattered across different countries the transmission of this information is often international. The cost of operation of the market place and the cost to the users will be reduced if the user's tasks initiate only

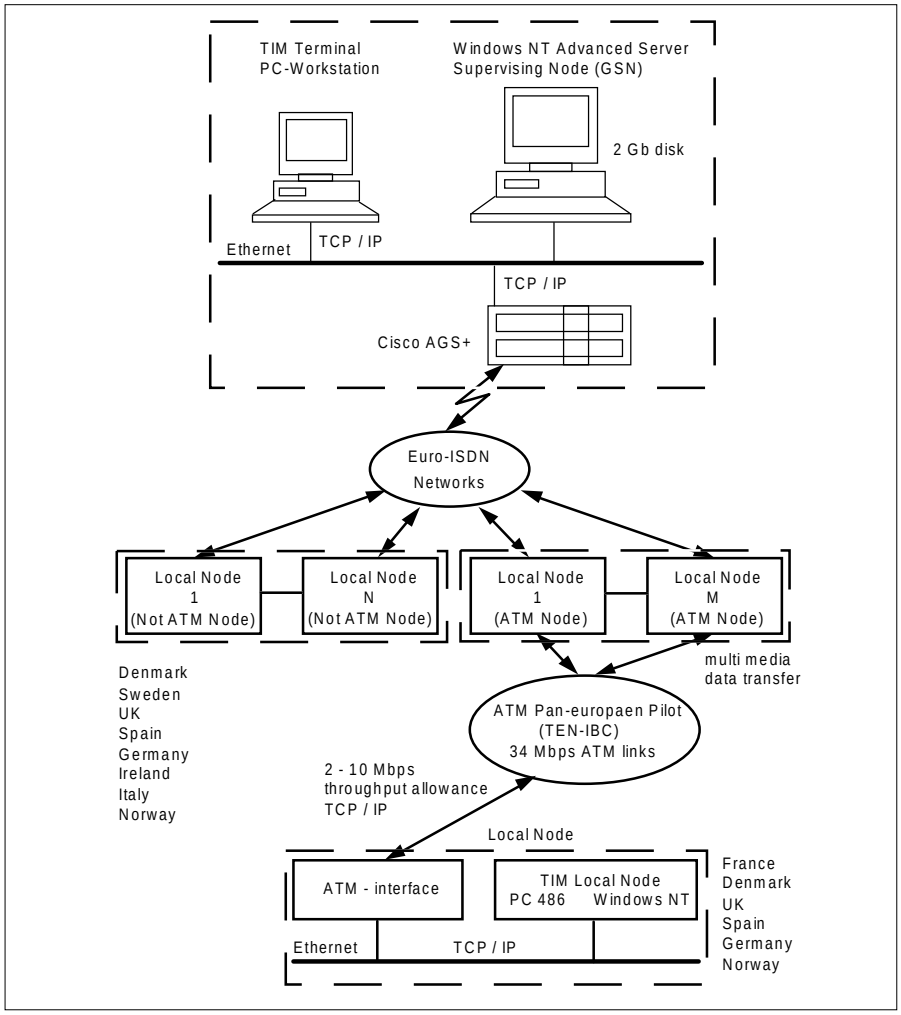

Figure 1: The ATM and ISDN networks for MAT

local or national calls. This would be possible if the market place was supported by a set of regional service providers (RSP) who provide services to local user companies as indicated in Figure 2. The regional service provider would host a regional server and multimedia file store and booking system and would be interconnected with all the other regional servers and file stores via international ATM links. User connections to the regional service provider would be via ATM, or ISDN, or CATV, or other networks. When a point-of-offer user distributes multimedia to the market place it will be mandatory to distribute it to their regional service provider. The network of regional service providers is then used to provide a cost effective multimedia transfer system. Real time transfer of new multimedia information for users will require a high bandwidth connection to their regional service provider, however, users may begin with initial low cost connections and migrate to a higher bandwidth in accordance with the development of their business requirements. PoS users may mitigate the effects of a low bandwidth connection to their regional service provider by retrieving a desired set of multimedia product descriptions to cover expected customer demand. This second set of MAT trials will begin in March 1996. International ATM connections will be used between RSPs in: Berlin, Gothenberg, Malmo, Copenhagen, Oslo, Paris, London, Barcelona, Linz.

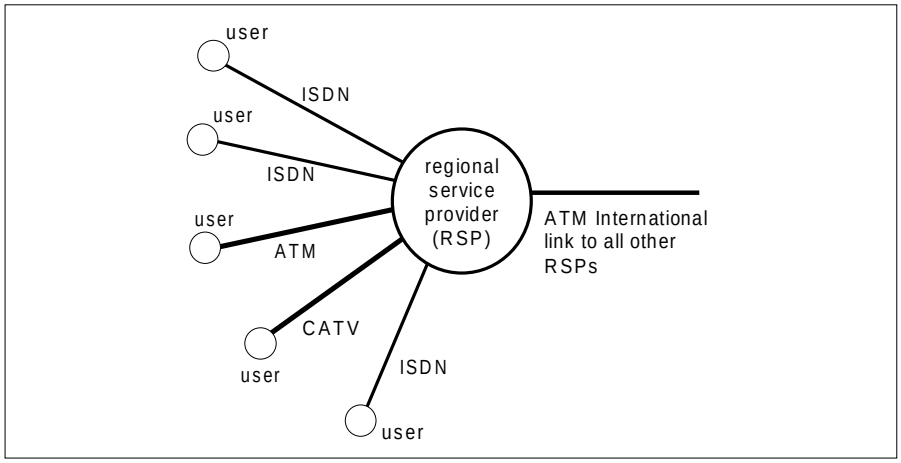

Figure 2: User connections to regional service providers for the second set of trials

SAM - A World Wide Market Place

The objective of the SAM project is to establish trials of the market place with users and regional service providers across the world. SAM sites and partners are being established currently in the following locations: San Diego, Calgary, Ottawa, Singapore, Kuala Lumpur, Sydney, Tokyo, Trento, Pomezia, Cape Town, and Zurich, Stockholm, Athens, Lisbon, London, Oslo, Paris, Barcelona, Copenhagen, Berlin, Malmo, Gothenberg, Vienna. The trials will use the regional service provision concept of MAT though the services will be primarily based upon existing public networks such as ISDN in order to derive a business analysis for commercialisation in the near future. The trials will begin in March 1996 (integrated with those of MAT)with an enhanced version of the application developed in TIM and will then build up to full beta tests of the market place.

A distributed database of multimedia information which can be accessed worldwide by potential visitors, whether through a travel agency or from home, requires consistent and valid data which will enable the PoS or holiday-maker to (i) search through available product offers by making queries to the database, (ii) have a thorough understanding of and confidence in the type and grade of the product or service being purchased from the information presented following the database search. One essential requirement for search of a database containing world-wide offers is that all PoOs utilise the same set of product attributes when assigning their product information to the database. These product attributes are then used to guide product search at PoS.

A basis for a set of product attributes are the methods of classification and grading used within the tourism sector. Some support for the development of standard classifications and gradings has come from the operation of destination marketing systems. These are local databases of information often maintained by a tourist board and in many cases associated with a local reservation system. Unfortunately these databases provide information to visitors after arrival, thus common international standards has not been a major issue for them. In general, classification/grading methods are owned or operated by tourism companies, tourist boards, and trade associations for their own products and as a consequence they are rather ad hoc. The majority of existing schemes are concerned with the standard of accommodation or food (Crown scheme in England, the Michelin scheme, the Star scheme of the American Automobile Association), however, increasingly schemes are being developed to grade(quality) or classify (facilities) other sectors, e.g the ATIS project in the IMPACT 1 programme made some progress based upon perspectives from European motoring organisations. An important step towards consolidation of these developments was taken by the Deutscher Fremdenverkehrsverband. Their Touristic Information Norms (TIN) provides the basis for search structure and reservation within Germany in SAMSON.

The SAM database services do not require agreed general international standards but they do require consistent use of product attributes by different types of PoO when they are using SAM. The project must therefore define attributes that all the PoO users of the SAM system are willing to use. It may be that as a consequence international standards for general use in product descriptions are encouraged, however, the results of SAM should be seen as an important input to the international standards process rather than as definitions of the standards themselves. The TIM (R2078) project developed a set of product attributes, defining over a thousand product types, sufficient for database search from existing classification methods and demonstrated that PoOs were able to use them. This work is being extended in MAT and SAM in a global context.

Perspective

In order to support dissemination of the results of the trials and to encourage participation in evaluation the SAM project includes regional workshops. For example, a series of these in south and south-east Asia in late 1995 and early 1996 is supported by DG1 of the European Commission as well as ASEAN Tourism Information Centre and DeTeBerkom Asia. In addition to the regional workshops, a SAM International Congress is being organised in Edinburgh for the fourth week of May 1996. One of the topics of discussion will be to review the work of MAT and SAM on standards in the tourism sector. Further information can be obtained from http://www.ebs.hw.ac.uk/matsam. ■

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