It is thus possible to go through an intermediary or to go directly to the customer. In the first case this can be the tour operator ot the travel agent.

a$_1$) With regard to enhanced distribution through tour operators the question is one of living up to the conditions or terms set out by the tour operators. This can be logistic, economic, demand or communication-related conditions.

a$_2$) Several groupings of Danish product owners have the opportunityto act as wholesalers themselves and gain access for their products in computerised resevation systems, e.g. the German system START. The large Danish holiday cottage booking agencies are the only Danish suppliers who have been and will be able to accomplish this task. This indicates the need for a considerable sales volumes should other Danish supplierswish to follow their example.

b) Thanks to its potential for selling directly to the customer the Internet / Worl Wide Web is a chanel for information presentation as well as for sales and distribution, with many opportunities for all Danish tourism products.

Hotel owners who wish to distribute all or part of their capacity as single overnight stays at a hotel. Therefore these products should be made available through specific sub-systems, of which one of the most well known is the so-called TOMA (TOurism MAsk) in the German START system. However, similar sub-systems can be found in other markets. It is possible to gain access to both START and several other relevant systems via a technical intermediary link in Hamburg, Germany. But this only applies where there is considerable sales capacity. A preliminary estimate indicates that at least a couple of thousand holiday cottages are needed if a Danish booking agency – likewise the large booking agencies – wishes to choose this solution. This would additionally imply a strategy of selling exclusively through travel agents in the German market. If around nine mediumsized Danish holiday cottage booking agencies joined forces, they would be able to achieve the necessary volume. For groups of at least seven to ten (Danish) holiday centres it seems the right thing either to co-operate with Danish holiday cottage booking agencies or foreign tour operators.

There are many opportunities for enhanced distribution of all Danish tourism products via the World Wide Web.

ACKNOWLEDGEMENTS

This paper is based on the summary of a book written by the author of this article in Danish ("Distribution af danske turismeprodukter i Europa", about 350 pp. including appendices etc.) published by the Research Centre of Bornholm, Denmark, in April, 1998 (rcb@rcb.dk). The research was commissioned by the Danish Tourist Board (www.dt.dk), and undertaken during 1997 by the author himself (marcussen@rcb.dk; www.rcb.dk, 'staff', 'CHM').

THE EMERGENCE OF LINKED FISH MARKETS IN EUROPE

BY IAN GRAHAM, UNIVERSITY OF EDINBURGH, SCOTLAND*

ABSTRACT

This paper discusses the development of remote bidding electronic fish auctions. The first electronic fish auctions were introduced in Belgium and Holland and they emulated the clock auctions seen in Dutch vegetable and flower auctions. The evolution of vegetable auctions provided a model for the fish industries, with the next stage being the linking of auctions and then remote bidding. However, the fish industry differs from the vegetable industry in having less developed systems for product description.

Two projects to develop pan-European electronic fish markets are compared with two competing systems in Iceland. The European Commission funded INFOMAR project is compared to the system being developed by Zeebrugge fish market. While the INFOMAR project started with a radical vision of selling fish electronically off boats in a pan-European market, the Zeebrugge project is a more incremental vision to link markets to build a pan-European network of existing market. It is seen that the two projects have converged due to the complexity of the European fish industry leading INFOMAR to operate through existing markets.

* *Ian Graham (grahami@wrb1.bae.ed.ac.uk) is a lecturer in Operations Management at the University of Edinburgh. He has undertaken wide research into the social shaping of electronic commerce, concentrating in the last two years on the social barriers to the formation of elctronic markets.*

MARKETS FOR FISH

Fish is a commodity sold by auction throughout the world. The structure of the fish industry is for a large number of boats to sell their fish to a smaller number of processors in local markets, usually at the harbour where the fish is landed. The buyers are looking to meet their requirements by buying in a number of markets, but the seller, once the fish is landed, has little option other than to sell to someone in that market. The volumes of fish landed are influenced by the luck of the boat and the weather, leading to price volatility and price variations between markets. The use of electronic clock auctions, when linked to the automated processing of transactions, speeded up the sale and reduced the cost of auction administration. In Continental European markets the practice of selling fish by the individual box made the introduction of electronic auctions more attractive than in the United Kingdom, where the standard practice is to

auction all the boxes of the same species and size off a boat as a single lot. The availability of widely disseminated market price information has led to a growth in direct selling between the boats and agents acting for the processors. In some smaller ports, for example Ullapool in Scotland, there is no organised fish auction.

The first fish auction in Europe which was open to remote bidding was implemented in Bergen, Norway in 1992 for Norges Sildeslag (NSS) (Schelfhout 1995). The advantages claimed for networked fish auctions include greater competition in the market, lower transaction costs and greater market transparency (Haines 1997). Norway has the largest fishing industry in Western Europe but the ports at which fish are landed are separated by large distances and poor roads, making transfers between ports difficult. In the old system boats radioed the details of their catch to NSS in Bergen who then faxed the details to buyers from across Norway. Buyers then had one hour to fax back tenders for the fish. The highest bids were identified and the winning bidders faxed with confirmation of the fish they had bought. The advantage of this system was in remotely selling the fish while on the boat so that the boat could then divert to land the catch at the location nearest the processor who had bought the catch. The computerised system reduced the administrative cost for NSS in running the fax auction and speeded up the auction for buyers, allowing them to adjust their bidding strategy as the lots were sequentially sold. An auction with catches from 25 vessels being marketed to 25 buyers, which previously took over three hours, could now be completed in thirty minutes. SCS implemented similar systems at La Rochelle and Cherbourg in France and IJmuiden, Den Helder and Urk in the Netherlands. However the variability in fish quality and the lack of reliable standards for fish description were barriers to remote fish selling, with the fish buyers subscribing to the system to gain access to current price information in each local market, leaving their agents in each harbour to inspect the fish and bid at the auction.

ICELAND

The national European fish market in which remote buying is most highly developed is Iceland. With annual production of 1,576,000 tonnes, Iceland's fishing industry is twice the size of Britain's and only slightly smaller than Norway's. However, despite the economic importance of fish to the Icelandic economy, it is only in the last ten years that fish auctions have been established. The lack of fish auctions in Iceland was noted by Cassady (1967), who saw it as an inexplicable anomaly, but suggested that it was because the fish landed in Iceland was almost wholly for canning and freezing, for which the processors would know the stable market price. However, it was suggested by the operator of one of the markets that it was more due to the number of harbours and difficulty for buyers of moving themselves or the fish between harbours. In Iceland fish are landed at a large number of small harbours around the coast and were purchased directly from the boats by merchants and processors. The poor road network outwith the Reykjavik area made the transfer of fish between harbours difficulty, with fish dried at the point of landing, so there were few buyers at each harbour. The first fish markets in Iceland were established in 1987 in Reykjavik, nearby in Hafnarfjodur and 50 kilometres away at Sudernes. These markets were formed by consortia of entrepreneurs, companies in the fish industry and local government who could see the commercial potential of opening trade in local harbours to wider customers. From these three companies operating markets, two competing electronic systems have developed to link markets, which have spread to almost all the Icelandic fishing harbours.

Year	Total Sales (tons)
1992	36,952
1993	41,176
1994	41,955
1995	46,474
1996	51,373

Table 1
Volumes traded on TENGILL in Iceland.

TENGILL

In 1987 FMS (Fishmarket of Sudernes) opened the first Icelandic fish markets in three towns in the Sudernes area of the Reykanes peninsula: Njarvik, Grindavik and Sanderöi.A company, RSF (Reiknistofa Fishmarkada hf) was formed by the three initial market owners to operate an electronic marketing system, Tengill, which runs on an Hewlett-Packard 9000 D-250 UNIX computer using the Icelandic X.25 data network to connect to local auctions. Each local auction has a personal computer, modem and printer. Prior to the auction all the buyers at each market pick up a print-out describing the lots for sale in terms of species, weight, size, time since catching, catching method, location and whether gutted. In Iceland there is currently no unified standard for fish descriptions. The auction follows the English method of bidding, with the central auctioneer progressively raising the price, with buyers at each auction able to hear him over a public address system. At each local auction bidders who still wish to remain bidding raise paddles displaying their number and the operator at each local auction has a button which he presses if their is still someone at their location bidding. The auctioneer can see on their computer which locations still have active bidders. When there is only one bidder left holding up their paddle, the system can identify the location of the successful bidder and the price they offered, but he does not know the specific identity of the bidder.

The Icelandic Tengill system has been in use since January 2 1992 linking between 6 and eleven fish auctions. The system serves 300 buyers and 1000 sellers. Annual sales in 1996 amounted to approximately 51,000 tons, worth $58 M.

BODI

The competing BODI system in Iceland was developed by two other fish markets. In 1991 the fishmarket operators, Faxmarkadur in Reykjavik and Fishmarkadur in Hafnarfjordur, contracted for SCS of Belgium to carry out a feasibility study for implementing a remote electronic fish auction. The proposal was to develop a system mirroring Tengill's linking of dispersed markets but replacing Tengill's use of bidders holding up paddles with an auction clock and button bidding. Faxmarkadur and Fishmarkadur set up a company, Islandmarkadur HF (Fish Market of Iceland), and had an auction system developed by Icelandic contractors. Each auction market has a computer to run their auctions, computers for bidding and a button computer for each participating bidder. This computer shows on its screen the bidding clock and the auction is by Dutch auction. The system is able to catch the identity of the first bidder to bid and the price on the clock at that time. Buyers have an electronic key which is inserted in the button computer so they do not have to always use the same computer (Hallgrimsson 1994). While the number of auctions linked in the BODI system is fewer than in the Tengill system, the volume of fish traded on the system is higher because it includes the two largest Icelandic fish markets. Between January and August 1997 ISM marketed 48,564 tonnes of fish compared to RSF's 38,324.

FAILED MERGER OF TENGILL AND BODI

In March 1997 negotiations took place to merge the two systems. In comparing the two systems Hallgrimsson of ISM saw their system as being more sophisticated while for Johannsson of RSF this sophistication led to unreliability and very inflexible procedures for entering data. Any merger of the systems would have come down to a choice between the manual bidding of Tengill and the button bidding on BODI. An independent telephone survey was commissioned by the two system operators to identify the preferences of buyers. Of these buyers, 72% preferred Tengill, mostly because they could listen to the voice and read their notes, whereas with the clock system they had to concentrate on watching the clock.The success of remote bidding fish auctions in Iceland formed a catalyst for a project to develop a Europe-wide electronic fish market within a European Commission funded project, INFOMAR.

REFERENCES

Cassady, R. Auctions and Auctioneering, University of California Press, Berkeley, CA, 1967, p20.

FAO, World Agricultural Statistics, FAO, Rome, 1989.

Fishing News, "Milford's First Electronic Fish," Fishing News No. 4352, 27 June 1997, p 3.

Haines, M. Information and Communication Technologies for the Seafood Industry: The Key to Better Marketing of Fish, Welsh Institute of Rural Studies, University of Wales Aberystwyth, 1997.

Hallgrimson, A. H. BODI Fish Auction System, ISM, Reykjavik, Iceland, 1994.

CEC Project Summary for Infomar (22201), Commission of the European Communities, DGIII, Brussels, 1997.

Schelfhout, L. "Electronic Auctions: Computerising the Heart of the Market," I&T Magazine, No 17, July 1995.

INFOMAR

The INFOMAR project was initiated by an Icelander, Gylfi Adalsteinsson. Adalsteinsson produced a presentation of a vision of the European fish industry in which boats would describe their catches while at sea with the system marketing them to buyers from across Europe. This vision was influenced by the acceptance in Iceland of selling on the basis of the skipper's description. Adalsteinsson contacted Vega, a systems and telecommunications specialist, based in Welwyn Garden City, to undertake the technical elements, and Havinfo of Tromso, a small Norwegian company, to take responsibility for developing the satellite links to vessels. The INFOMAR project was budgeted to cost over £3 million, with part-funding from the European Commission's Esprit programme. The project had two elements. First, a Trade Information and Forecast Service, providing data and forecasts on fish prices, weather, quota status and other industry data and forecasts. Second, a Fish Exchange Trading System "a value-added module to the network where buyers and sellers can match their needs, agree on prices and define handling, processing and transport routes"(Infomar 1997). The project started in May 1996 with VEGA as project managers. However it was fairly rapidly apparent that the original business concept was unworkable. The business case for the redesign of the industry was based largely on the structure of the Icelandic industry, bypassing the existing market infrastructure and connecting buyers and sellers directly. It was found during preliminary discussions with people in the English fish industry to be difficult to do this as the markets' functions were wider than simply auctioning the fish, including credit clearance, payment of crew wages, landing and packing, and the project was restructured towards including existing market operators rather than trying to bypass them. It is planned that the service will be commercially launched in Summer 1998, as a Web-based intermediation service linking existing market operators to buyers.

PAN-EUROPEAN FISH AUCTION (PEFA)

While INFOMAR evolved from a radical to a less ambitious vision of the use of IT in the fish industry, Zeebrugge was developing a plan to link European fish markets into a network. In Summer 1997 Milford Haven Fish Auction, Zeebrugge and La Rochelle linked their three markets using ISDN lines, allowing buyers in each market to bid for fish landed in each other market. It was planned that the network would then be extended to IJmuiden and Den Helder in the Netherlands. On June 19th 1997 boxes of ray and plaice landed at Milford Haven were bought by a buyer in Belgium (Fishing News 1997). However, in Summer 1997 Zeebrugge reassessed their policy of using ISDN lines to link the markets, finding the cost of international ISDN lines excessive. They decided to develop an alternative electronic fish market based on a world-wide web (WWW) site. The site is planned to have various levels of access, from passive observers to active bidders who have credit clearance to buy. The system has been named Pan-European Fish Auction (PEFA) . The site is planned to be in operation in Spring 1998 , using the system to build incrementally a network of linked auctions. PEFA and INFOMAR may therefore be seen as very different routes to achieve the same end: a pan-European fish market with remote bidding.

THE BARRIERS TO THE FORMATION OF PAN-EUROPEAN MARKETS

While the success of remote fish markets in Iceland suggests that electronic marketing of fish is practicable, this success can largely be explained by the close network of the Icelandic fish industry. Both INFOMAR and PEFA are seeking to extend this model to a pan-European level. While they started from very different positions, when confronted by the structure of the European fish industry their visions have converged. While European Commission support for INFOMAR may be seen as a policy intervention to make the single European market for fish a reality rather than a rhetorical concept, and PEFA a strategic attempt by Zeebrugge to place themselves at the heart of the European fish market, they have both accepted that to build a pan-European fish market will require the enrolment of existing intermediaries in the fish industry, both because these are the bodies with the links to the boats and also the only bodies with the expertise to grade fish. However, it is this need for reliable and consistent grading which leads to uncertainty about the success of these electronic market initiatives. In close networks,as seen in Iceland, opportunism is controlled by the knowledge that it will prevent the other party from trading with you again and there will be costs if they tell others of the behaviour, but in anonymous perfect markets these pressures are much less. It was therefore the literal insularity of the Icelandic fishing industry which enabled buying on description to be successful without a complex system to guarantee descriptions. To introduce a market open to all bidders and sellers across Europe requires a means of guaranteeing the transactions, specifically guaranteeing to sellers that they will be paid and to buyers that they will receive the fish described. It was the necessity of these institutional roles which led to realisation that both PEFA and INFOMAR would have to operate through existing markets rather than bypass them.

PROMOTION OF ELECTRONIC COMMERCE BY A REGIONAL CENTRE

BY C. C. CHARLTON, S. GRANT, P. H. LENG AND I. E. NEILSON, THE UNIVERSITY OF LIVERPOOL, UK*

INTRODUCTION

The emergence of the World Wide Web, together with current and anticipated developments in network technology, are likely to lead in the near future to the use of the Internet becoming part of everyday life for most households in the developed world. This expectation has given rise to immense interest in the potential for electronic commerce through this medium. Probably the commonest paradigm for web-based commerce is that of retailing via an electronic product catalogue, and already a large number of such catalogues have been established: for a survey of these, see Palmer (1997). Internet-based retailing offers obvious advantages over other forms of selling, including low set-up costs and overheads and immediate access to world markets. Despite these advantages, the results for early adopters of the technology have been relatively poor, leading some observers to question whether on-line selling will become of major importance as rapidly as had been supposed (Phelan 1996).

With this background, an examination of the barriers to the establishment of electronic commerce is of interest. One obvious problem is that of critical mass: as yet, there are relatively few potential consumers using the Internet, and, except in certain specialised markets, most are not accustomed to using the medium for purchasing. This has made even large companies reluctant to invest in electronic commerce, and consequently the numbers of retailers on the web are relatively small and scattered. The other problem on which much attention has been focused is that of security. In a 1997 KPMG survey of 100 major UK firms, (http://www.kpmg.co.uk/uk/services/manage/ec06.html) lack of security on the Internet was perceived as the greatest current threat by 60% of respondents. Interestingly, however, this was generally seen as a short-term problem for which technological solutions were expected. Among smaller businesses, security seems to be a lesser fear: questionnaire responses