

VIMP – A VIRTUAL MARKET PLACE FOR INSURANCE PRODUCTS

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ELECTRONIC MARKETS AND INSURANCE

Insurance and other financial services appear to be well suited to being sold electronically. No physical goods are involved, as insurance is in effect a purchase of a promise, in the form of a contract, which can be successfully described electronically. Indeed, in some countries a legally enforceable contract can now be completed electronically, opening up the possibility of advertising, searching for, comparing, choosing, and taking delivery of insurance products via the internet. The annual renewal cycle in many non-life lines of business (such as car and household insurance) makes the possibility of comparing alternative insurance products particularly attractive to consumers, and in many countries a non-electronic market place thrives, operated by intermediaries such as banks, insurance brokers, independent agents and financial advisers.

Electronic market places for such products as books, CDs, computer software and hardware have developed quite rapidly on the internet. Comparative shopping tools for such goods, such as Jango from Excite (www.jango.com), are still evolving, but they are already relatively easy to use. However, there are important differences between the sale of the type of goods mentioned above and the sale of insurance and other financial products which make such market places less well suited to transacting insurance sales over the internet. This paper explores some of those differences from both the providers' and customers' perspectives, and describes the development of ViMP, a virtual market place specifically designed for insurance and other complex products and services, at IBM's Zurich Research Laboratory.

THE NATURE OF INSURANCE

INSURANCE AND TRUST

Insurance is heavily dependent on trust. The insurer prices cover on the basis of information disclosed by the insured, and whilst insurers can independently verify some of the information provided, much of it is taken on trust at the time of underwriting (though it may be subsequently scrutinised in more detail in the event of a claim). The policyholder also places trust

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in the insurer. A premium is paid in advance, on the understanding that a subsequent valid claim during the period of insurance will be paid. For non-life insurance, the period of insurance is typically a year, while for life assurance it may continue for the remainder of the insured person's life. Such a long running relationship contrasts with the simple purchase of goods, where the transaction is completed upon delivery. Insurance and other financial services tend to be regulated in individual markets. Government agencies control who may transact such business and in many countries impose restrictions on the sales process.

An electronic market place for insurance products must therefore be able to control the presence of providers, and monitor customer and provider behaviour. If such controls are facilitated, the operator of an electronic market place might be able to give certain guarantees to prospective customers. For example, a government agency or national insurance industry association could operate an internet market place with a guarantee to customers that all providers within the market place are authorised to transact insurance within certain geographies.



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FOCUS THEME

COMPLEXITY

Insurance products are complex. An insurance policy has benefits, conditions and exclusions which add detail to the high level coverage features advertised by the insurer. The customer's financial security, which drives the demand for insurance, is also complex (Haller 1975), and it is a much more difficult task to match the financial requirements of a customer with appropriate financial products than, for example, finding those shops which stock a particular book.

The need for insurers to understand the individual risk, and for customers to understand the features, benefits, conditions and exclusions of proposed policies result in a substantial pre-sales dialogue between insurers and their prospective customers. An electronic market place therefore has to be able to manage such a dialogue, which may be conducted by a prospective customer with more than one insurer simultaneously. The prospective customers will not wish to be asked a succession of similar questions by each insurer in turn, preferring the market place to conduct a single dialogue, handling the "one to many" aspect on their behalf.

Typically, the features of an insurance product, such as its premium and its benefits, will not be fixed, but will vary according to the risk information supplied by the customer. Indeed, the availability of a product may be determined according to the risk profile of the customer. This gives rise to the need for the insurer to assess the information provided by the customer, as well as the customer's desire to match requirements against supplied product information. An electronic market place will therefore need to provide a symmetric match-maker, capable of exploiting this bi-directional exchange of information (see Figure 1).

CONFIDENTIALITY

The dialogue mentioned above often involves confidential information. This is particularly the case with personal lines insurance, where such information as

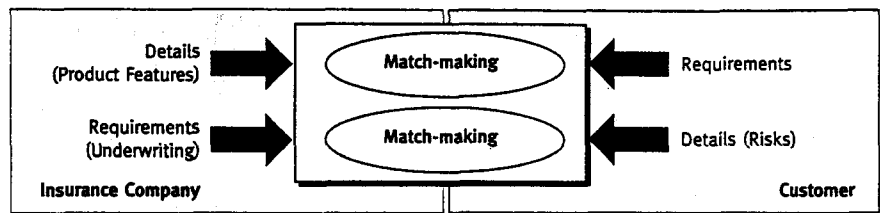


Figure 1 The symmetric match-making process

name, address, dates of birth, medical history, the value of possessions and amounts for investment need to be disclosed. Even in commercial lines, information such as property values, annual sales and annual wage bills (all frequently used as underwriting and rating factors) may be considered by many companies to be commercially confidential. Of course, almost all electronic commerce solutions have to involve the transmission of some confidential information, namely payment details. However, in most situations such sensitive information can be withheld, and the buyer can remain anonymous, until the point at which a purchase decision has been made. This is not the case with insurance, where the insurer requires such confidential information to be disclosed before an offer can be prepared.

There would therefore appear to be a conflict between the insurer's desire to receive detailed information prior to putting forward an offer, and the customer's desire to limit the dissemination of confidential information. This is a particular problem for a market place that aims to put the

customer in touch with many insurers. The guarantees proposed above may help, but a further measure could be to stage the dialogue such that increasingly detailed information is exchanged over time (see Fig. 2). At any point in the exchange either party (the customer or the insurer) may decide to discontinue the dialogue because either the products being discussed do not match the customer's requirements, or because the customer's risk information is such that the insurer does not wish to put forward an offer.

Such a staged dialogue, where at each stage both parties may select each other also helps the insurer to limit the dissemination of information which it may consider to be commercially sensitive, or costly to produce, such as detailed premium quotations. Traditionally, the calculation of insurance premiums has been based on mathematical models, associating historic claims behaviour of a population with application form details, translated into the application of a simple algorithm to a set of rating tables. As this methodology has been common among insurers it has been possible with some

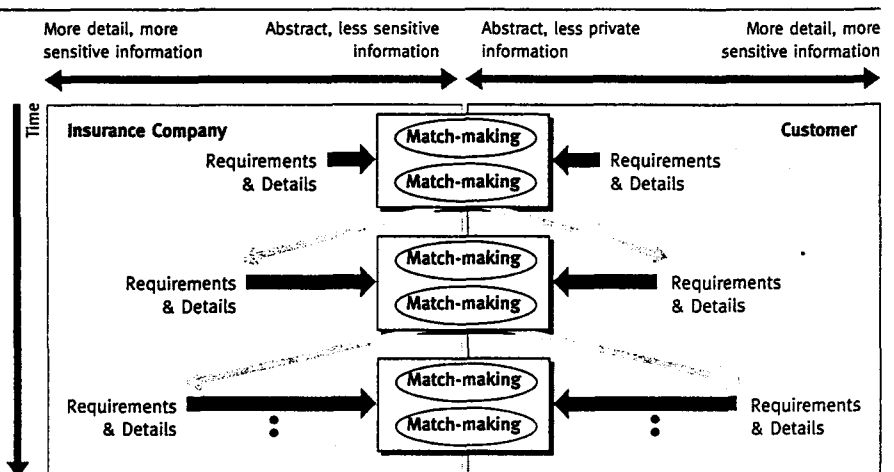


Figure 2 The staged dialogue - going from the general to the specific

classes of business, such as car insurance, to apply a common algorithm (known as a rating engine) to rating tables specific to individual products. This has made the sharing of pricing information on a common systems platform possible (e.g. in an insurance broker's office, or an internet market place such as InsWeb, InsureMarket and ScreenTrade).

However, more recently, there has been a trend among insurers towards applying more complex models which rate applicants as individuals rather than as members of larger populations (Field 1995). Insurers no longer wish their premium calculation to be tied to a common algorithm, considering their freedom to calculate premiums as they wish an essential tool with which to control the profitability of a portfolio. Some insurers make use of third party data sources as a means to verify information provided by the customer, or to provide additional information to contribute to the rating process. Others may wish to consult their customer databases, rewarding profitable customers who have purchased more than one product, and who have been loyal over a period of time. These objectives can only be met if the insurance company has considerable control over its presence in the market place. The insurer's contribution to the more detailed stages of the dialogue needs to take place, not at a centralised site alongside other insurers, but within their own systems environment, so that premium calculations can remain confidential and can make use of data sources private to the insurer. The market place therefore needs to be distributed among the insurers. A distributed market place will also facilitate the re-use of existing systems for such tasks as premium calculations which are already likely to exist in support of other sales channels. This is clearly a more efficient use of resources compared with requiring insurers to provide duplicated pricing information to a centralised server operated by a third party. It also enables the insurer to have complete and dynamic control over changes to products and prices.

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- ◆ Symmetric match-making
- ◆ A staged selection process
- ◆ A distributed market place

Such an electronic market place has been developed at IBM's Zurich Research Laboratory. ViMP (the Virtual Market Place) is based upon an extension of the ideas enshrined in the CORBA Trading Service (OMG 1996; Hoffner et al. 1998). A network of match-maker objects or traders, which perform the symmetric match-making described above, represents the distributed market place, with each tier of traders being responsible for determining the suitability and availability of products following each successive stage of the dialogue. The market place manager or regulator can control connection to the network.

PRODUCT DEFINITION AND ADVERTISING
 Within each company the Product Manager tool (see Fig. 3) is used to define the

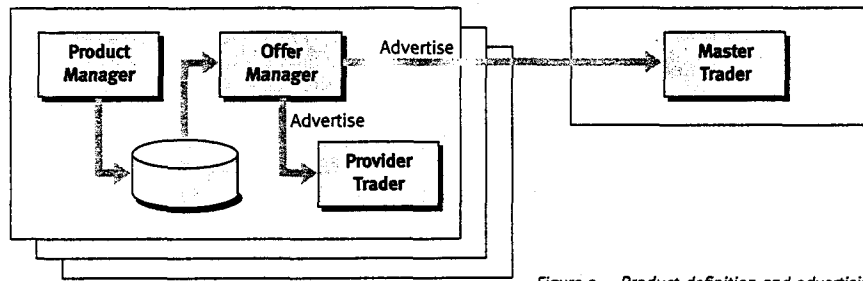


Figure 3 Product definition and advertising

THE DESIGN OF ViMP

We have shown how insurance products and the demands of insurers and prospective customers have special considerations when compared with the sale of more conventional, physical goods. This in turn leads to particular design criteria for any electronic market place that is intended to transact insurance and other financial services. A detailed discussion of the criteria, and their relationship to the requirements of insurance companies and customers has been presented elsewhere (Field et al. 1998), but the most important criteria have been shown here:

- ◆ A controlled and potentially regulated market place
- ◆ A co-ordinated dialogue

products to be advertised in the market place, describing each product's features, target markets, underwriting criteria and pricing algorithm. As some of this information may already be encoded in an existing system, the definition may contain a pointer to existing applications which will return an appropriate value at the time such information is needed by the market place. A simple script language has also been developed to enable dynamically derived values to be calculated without the need to develop bespoke computer programs.

The Offer Manager tool is used to advertise the products in the market place. An advertisement for each product is placed

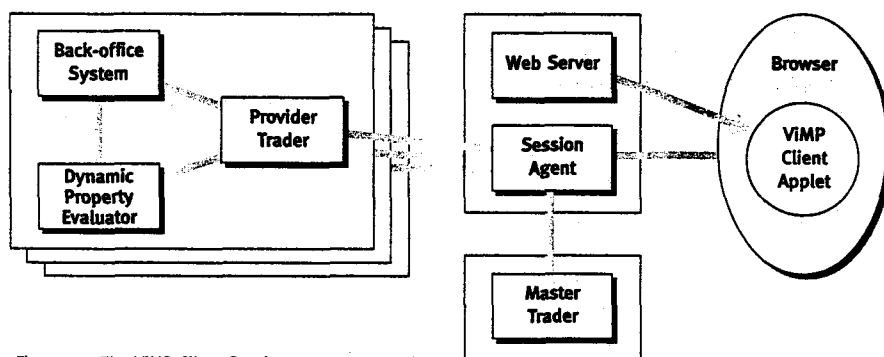


Figure 4 The VIMP Client Session

in a trader at each tier. Each advertisement contains product features and underwriting criteria, however the level of information contained in the advertisement decreases with the distance from the insurer's system. Thus the information placed in the Master Trader, alongside advertisements from competing providers, does not contain commercially sensitive information such as pricing algorithms, and can be thought of as a 'shop-window' advertisement, whereas that placed in the Provider Trader, which is within the company's own systems environment, contains detailed pricing and underwriting information.

For the sake of simplicity, only two stages, and therefore two tiers, are shown in the Figures 3 and 4. However, the design could easily be extended to have, for example, the master trader as the first tier, a company-level trader as the next tier, and a trader in each department to handle a third, more detailed stage of the dialogue. At the most detailed level, the traders may be connected to existing systems, enabling their re-use to calculate dynamic values such as premium and benefits, and facilitating the initiation of policy issuing processes when a customer accepts an offered product via the market place.

CLIENT SESSION

A client session begins when a customer visits the home page of the market place (see Fig. 4). A java applet is downloaded to the customer's browser, and a Session Agent object, which will co-ordinate the dialogue between the customer and the market place, passing on information to

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insurance companies as appropriate, is instantiated. The Session Agent can offer the customer such facilities as saving the state of the dialogue for resumption at another time, and can provide market place auditing features for a regulator or market place manager.

The Session Agent presents the customer with each stage of the dialogue. This may consist of choices for the customer (e.g. which companies to continue dealing with), an invitation to state requirements (growing in detail at each stage of the dialogue), and requests for further risk information (again, growing in detail and sensitivity with each stage). As the dialogue becomes more detailed, so the responsibility for the match-making is passed by the Session Agent to the next tier of traders, giving each company increased control over the information as the detail and sensitivity of the information increase.

With two tiers, and therefore two stages to the dialogue (as illustrated in Figures 3 and 4), the Session Agent will first gather information from the customer, then query the Master Trader. Those 'shop window' advertisements (previously placed by each company's Offer Manager) which pass the match-making are returned to the customer as a set of options. The customer can then decide with whom to continue the dialogue, and the Session Agent then presents the customer with the next stage of the dialogue. This more detailed information is then passed to the Provider Traders of each of those companies remaining in the dialogue. They then match their more detailed advertisements with the more detailed requirements and information from the customer, obtaining dynamic values from existing applications, or from the Dynamic Property Evaluator, which processes scripts created with the Product Manager. Offers for the products which pass this more detailed level of match-making are then passed back to the client applet, via the Session Agent, where they are presented in a flexible catalogue.

FLEXIBLE CATALOGUE

The flexible catalogue, which is part of the client applet, is a soft navigation tool that allows the prospective customer to explore the feature space of those offers which the insurers in the market place put before the customer. Soft navigation

is particularly useful where the customer may wish to express product feature preferences and view the corresponding proximity of each offered product. The result is a ranking of products, which can be tuned by the customer by varying the preferences and viewing the consequent effect on the ranked list (Stolze 1998). Such a tool encourages the user to consider non-price-related features, and helps the customer to explore the trade-off between product features and price. This is not just of benefit to the customer, because providers are also keen to have a means of drawing attention to their products' distinguishing features other than price (Guttman et al. 1998).

The catalogue therefore helps the customer make an informed purchase decision, and can facilitate product purchase either via the Session Agent or, as may be preferable in some business scenarios, directly with the selected insurer.

SUMMARY AND FUTURE WORK

The ViMP system described in this paper satisfies the necessary design criteria to support a market place for complex products and services such as insurance. A prototype has already been developed and a demonstration system has been installed on IBM's intranet. A more substantial pilot implementation, trading real insurance products, is planned for 1999 in partnership with a major insurance company. Further work is planned which will allow market specific rules to be defined independently of the set of providers attached to the market place. This will allow the ViMP market place infrastructure to support more than one electronic market place, with individual providers being able to advertise multiple products in multiple market places. An example of the type of market specific rules to be handled would be locally imposed compliance legislation such as national regulations for the sale of investment and pension products.

The need for common data definitions, to be used by all providers, and their management within the market place, have been left outside the scope of this paper, but are an essential pre-requisite for the successful development of a commercial electronic market place (Dogac et al. 1998).

There is also scope to extend the product description and matching languages used by the traders. Application of ViMP to a business services market place is planned which will bring together the semi-autonomous entities which form a virtual enterprise. It remains to be seen what further extensions to the ViMP architecture will prove necessary to cope with the different realm of business services, though we believe that such business to business trading of services will demand many of the design features already incorporated within ViMP.

ELECTRONIC COMMERCE IN (RE-)INSURANCE INDUSTRY

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INTRODUCTION

Today the term "Electronic Commerce" encompasses different aspects of electronic communication. The definition varies depending on the industry in question and the technology and provider used. The (re-)insurance industry understanding of it is a combination of business strategies and distributed processes using multiple technologies to manage the transaction of information between business entities by exchanging and processing recorded information electronically supporting the underlying relationship. This therefore includes unstructured (e.g. e-mail) and structured (e.g. EDI) electronic data transfer.

The following article shall focus on Electronic Commerce market initiatives - on a international and cross community scale - in the business-to-business sector of the

insurance industry (especially the electronic communication between broker, insurance and reinsurance company) and not on the waste field of the business-to-consumer sector of the primary insurance companies. It also shall show the peculiarities of the processes involved in the insurance industry in the light of the possibilities of the new technologies used in Electronic Commerce.

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INITIATIVES IN THE INSURANCE INDUSTRY

Despite the increasingly rapid advances made in the field of technology (PC, networking, Internet), companies in the insurance industry are making the most use of the new technical possibilities offered today in their internal operations only, while hardly employing them at all when communicating with their business partners. It consequently comes as no surprise that many of the work processes used in the insurance industry are still inefficient and prone to error, one reason being the necessity for data to be re-entered many times. To increase the efficiency of daily business in the insurance industry, a number of initiatives have been launched in the field of Electronic Commerce.

In 1987 8 major Continental-European non-life (re)insurers founded the RINET Community (Reinsurance and Insurance NETWORK). The aim of this network was and still is to take advantage of new technologies to allow it to capitalise on the possibilities offered by electronic commu-