

Products and Pricing in GI Marketplaces (Extended abstract; full paper currently reviewed by GeoInformatica)

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Abstract: The use and sale of geographic information lags behind its potential and the expected market growth. Mostly the products of the GI market consist of data sets. We propose the addition of technical, human, organizational, and institutional services to the raw material of geographic data. The integration of data and services to information services has to be executed by a networked cooperation of all players of geospatial value chains. This requires networked business models, and marketplaces for geographic information as supporting tools. Based on a scenario we investigate how GI marketplaces can mediate and support the process of generating information services. Results of this paper are concepts for three crucial issues of business networks: i. What services (intermediate products) are required for generating information services (end products)? ii. What are the services a GI marketplace needs to provide in order to support the generation of information services? iii. How does pricing work within business networks?

1 Introduction

Geographic Information (GI) potentially is a valuable resource of economy. But too often it cannot be used in business and decision processes. For too long a time geographic data sets have been considered as a solution for providing successful products. Selling raw data implies that the user has the expertise to use the data. This is often not the case and the producer is forced to find new ways to enter the market. The solution is a product that is ready-to-use.

Data sets and technical services alone are not the GI products tailored to the users' needs. The GI market has to add human services (e.g., consulting), organizational

services (e.g., connecting users with GI business partners), and institutional services (e.g., provision of standards for the access to all kind of services). The complex end product, tailored to the user's needs, we call *information service*.

The future generation of information services requires a networked cooperation of the entire geospatial value chains of producers, service providers, integrators, service enablers, and end-users (Niedzwiadek 1999). This requires new forms of business models that we call *business networks* (Brox and Kuhn 1999). Business networks require successful mechanisms for the communication and cooperation of buyers and sellers of geographic information. In addition, the specific requirements of the GI market have to be supported. A major tool for the unification of many companies and organizations in cooperation and competition are service-based *marketplaces for geographic information* (Brox and Kuhn 2001).

The paper focuses on three crucial aspects of business networks:

- What are the categories of products the GI market has to provide?
- What are the services a GI marketplace has to provide in order to support the generation of information services?
- How does pricing work within business networks?

2 Approach

Our starting point is to develop a scenario of a user who requires a typical information service of the GI market. Within the scenario we identify tasks, which have to be added to the raw material of geographic data sets in order to generate the desired information service.

From the tasks of the scenario we derive categories of services that the GI market needs to provide. As a result we want to demonstrate a principle, not a complete catalogue: The generation of an information product requires a great variety of services as intermediate products and the involvement of different types of players of geospatial value chains (data producer, software provider, service provider, integrator, end user).

Based on the needs of the user and his business partners in the scenario, we describe the services a GI marketplace provides in order to support the process of generating the information service. In the following we derive mechanisms of pricing in a GI marketplace. The decision making of service providers is complicated by the interdependency between price and non-price strategies. We show that price competition drives prices down and results in so called "price wars". Non-pricing competition involves competition on the value information services bring to the users.

3 Scenario

We develop a scenario where a bank evaluates locations of its branches. The evaluation is based on enterprise and demographic data, and it shall be supported by geographic information. The bank needs a tool and working processes for an in-house execution.

The generation of the desired end product includes among many others - the following tasks:

- Define requirements and goals within the bank
- Find business partners
- Search data sets
- Adjust geographic analysis tool to needed functionalities and integrate tool into enterprise system.

The generation of the needed product requires the integration of various services. The bank does not want and cannot put all these pieces together. The combination of data and services (“interoperation”) is a key concern to develop a GI business. The future market for geographic information is not a market of data but a market of *information services*.

4 Categories of products

The tasks of the scenario imply numerous intermediate products in order to generate the desired information service as an end product. In economic theory the term “product” is often used in a generic sense to refer to both the product and the service.

The bank in the scenario requires the following two intermediate products: data sets and a software tool. Such physical products are considered as one category of products of the GI market.

The scenario demonstrates the necessity of a great variety of additional services. The paper focuses on these services as intermediate products of the GI value chains. Based on the tasks of the scenario, we derive services that are essential for the generation of the desired end product. We classify these services into four additional categories of products (technical, human, organizational, and institutional services) and sub-categories.

5 Services of marketplaces for geographic information

GI marketplaces provide all kinds of geographically related products to all potential users. They appear on the GI market, but still they are lacking convincing strategies, business models, and services.

The paper points out how a GI marketplace can support the generation of an information service, produced by the integration of a great variety of technical, human, organizational, and institutional services. A GI marketplace

- Supports technical and human services by *mediation*. It provides information about services and providers, connects the end user with providers and providers with other providers, and facilitates transactions.
- *Can execute* organizational services. This depends on the business model of the GI marketplace. For example, the GI marketplace can run an order-and-payment platform for several business partners, or it can mediate the access to

the order-and-payment services of each specific provider.

- *Should execute* institutional services. The GI market needs mechanisms and institutions for its regulation, e.g., by standards for data and functionalities within a business community, quality assurance for services, and assurance of security of transactions.

GI marketplaces are tools for the transfer from the technical innovation of interoperability to the interoperability for all kinds of services in a successful business model of the GI market.

6 Mechanisms of pricing

Since Hotelling (*Hotelling 1929*), and Chamberlin (*Chamberlin 1933*) published their work it has been recognized that firms compete in many dimensions beside price. Decision making of firms is complicated by the interdependence between price and non-price strategies. According to Grant (*Grant 1995*) a firm can achieve a higher rate of profit over a rival in one of two ways: either it can supply an identical or similar product or service at a lower cost (e.g., lower price) or it can supply a product or service that is differentiated in such a way that the buyer is willing to pay a price-premium that exceeds the additional cost of differentiation. This section explains aspects of price and non-price competition on a GI marketplace.

6.1 Price competition

The market of Geoinformation products (GIP) is rarely perfectly competitive. In perfect competition there are many sellers, each of which produces only a small part of the industry's output. Barriers to entry the market are low (*Mansfield 1993*). In a perfectly competitive market firms produce similar or equal products at similar prices. Parts of agriculture are reasonably close to perfect competitive market structure

Competition often concentrates on price competition which results in so called "price wars". Price wars appear when a company lowers the price of a service or a product in order to attract more buyers. A natural response of a competing firm is to lower the price for its products and set it equal or a little lower to the price of its rivals. Brandenburger and Nalebuff (*Brandenburger and Nalebuff 1996*) asked a very interesting question: Is business war or peace?

We observed price competition in some segments of geomarketing data on the US and Canadian market (*GISMO 1998*). This market has characteristics of a commodity market where several providers offer standardized products, with limited features at similar prices. This is feasible only if the raw data are available at the same conditions to all service and data providers at prices that do not prevent development of value-added services and products.

6.2 Non-price competition

Non-price competition arises when firms compete on other dimensions than price and differentiate themselves from competitors on the market. Differentiation is achieved “*when a firm provides something unique that is valuable to buyers beyond simply offering a low price (Porter 1985)*”. Differentiation includes the way a company relates to customers and the way it does the business. There is no limit in opportunities for differentiation; a firm can compete on product and service design, location of sale, quality, time of sale, etc. The critical issue is whether the differentiation creates value for buyers. Profitable differentiation depends on two elements: on the *supply side* and *demand side*.

7 Conclusions and further work

The evaluation of one single scenario showed the necessity to apply technical, human, organizational, and institutional services on data. Services are the building blocks and intermediate products for the generation of information services. A networked cooperation of the geospatial value chains is crucial for the expansion of the GI market. Vertical GI marketplaces support the connection of value chains and mediate the generation of information services. With categories of products, services of GI marketplaces, and mechanisms of pricing we developed a basis for networked business models in the GI market.

Further work includes the development and evaluation of more scenarios, user requirements analysis in representative banks and insurance companies, and the implementation of concepts in a case study, which realizes a vertical GI marketplace for banks and insurance companies.

And, to answer the question about the business: “Business is not war and it is not peace”. It is an art of cooperation and competition at the same time (cooperative competitiveness); it is an art to create the market together and cooperate in building the market and it is competition when it comes to dividing it up (*Brandenburger and Nalebuff 1996*), (*Tapscott 1996*).

The reconciliation of high differentiation with low cost is one of the greatest strategic challenges facing firms in the current economic environment (*Grant 1995*).

8 Authors' coordinates

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