ECONOMIC STRATEGIES USED BY COMPANIES DEALING WITH INFORMATION GOODS, BASED ON SOFTWARE EXAMPLE

ADAM ANDRZEJUK

Department of Agricultural Economics and International Economic Relations, Warsaw University of Life Sciences (SGGW)

In this article, analysis was conducted on companies involved in production and trade of information goods. The research offers insight into methods of conducting business in information goods sector, which involves intellectual products such as, video tutorials, templated 3d models etc. related to professional graphics software packages, in this case Adobe After Effects and Cinema 4d. The paper explores how firms make use of special economic strategies, as described by Varian and Shapiro, particularly useful for trade in intellectual property products. An attempt was carried out to establish a connection between the number of strategies used by companies, and the number of potential clients which determine the success of a company. For that purpose a proxy system was contrived. The YouTube search engine was used as a way of finding required companies.

Keywords: economic models, economic strategies, information goods, market analysis, after effects, cinema 4d, YouTube

1. Introduction

Apart from the three classic economic resources which include: land, capital and labor, information is nowadays often viewed as the fourth factor. It's a resource indispensable for the functioning of every institution, and in the wider meaning of the word, for the State, as well as the national economy [12].

Asymmetry of information has also been widely represented in literature. The common contemporary problems of information, concern its timeliness, completeness, assimilation, readability and credibility. The information asymmetry is defined as a situation when one side of the transaction possesses more information on the terms of the transaction than the other side [5]. The existence of information asymmetry has a wide ranging consequences on the micro and macro scale. On the macro scale the problem of information asymmetry is related to the efficiency of the market. On the micro scale, we can talk about its profound influence on decision making in individual companies [15].

Information is inseparable if we see it as a means of competitive advantage for companies. According to K.Obłój, in order to obtain competitive advantage, it is important for a company to maintain an organizational structure which connects the strategic concept of a company and the technology. This in turn is used, to successfully build a value chain which helps the company to run its operations and to replenish its resource and skills. In fact the essence is how the company will compete (the drivers of competitive advantage), what resource and abilities keep the competitive advantage in the long run, and how to set up the value chain in order to make use of the resource in such a way as to maintain the competitive advantage [5, 10].

As apparent from the above descriptions, in most cases information is viewed as a source of competitive advantage, as well as, collected and processed data. In this article the author wants to concentrate on a more practical use of information. The main objective is to focus on information as a unit of economic transaction, in the form of information good. Production and trade of information goods forces the companies involved to assume certain behavior, which is significantly different than actions of companies operating in the industry of durable goods. In fact this forces the company to live within the environment of specific economic effects and to employ certain economic strategies. The difference between information goods and durable goods is so large, that it's not possible to explicitly implement the organizational schemes from the physical goods industries to the companies dealing with information goods. The aim of this paper is to demonstrate the influence of economic strategies on the activities of companies. The analysis is seeking to establish a connection between the number of strategies used and the number of potential clients in the information goods industry. Such companies deal with production and sales of video tutorials, templates, 3d models, ebooks, music, and other goods related to software packages such as Adobe After Effects, and Cinema 4D.

2. Information goods

What are the information goods? As stated by Varian and Shapiro, the basic unit that is transacted is what we call "information goods." This can be anything that can be digitized: a book, a movie, a record, a telephone conversation. Note carefully that the definition includes anything that *can* be digitized; There is no requirement that the information actually be digitized [18]. This is confirmed by Czaplewski, accordingly, information can be considered in the aspect of information goods. Czaplewski also credits Varian and Shapiro as the pioneers of information economy. The authors stress particular properties which are the domain of information goods, those include: returns to scale, information as public good, experience goods, difficulty in enforcing intellectual protection [3].

Shapiro and Varian investigated the information economy using three dimensions: information, technology, and policy. The information dimension encompassed concepts such as production costs, management of intellectual property and one-to-one marketing. The technology dimension consisted of the concepts of system competition, lock-in switching costs, network externalities, and standards, whereas the policy dimension comprised concepts of anti-trust and privacy [2].

Information products are characterized by no attrition (quality is not degraded over time), they can be easily copied (no additional costs when making a copy), they have network externality (word-of-mouth effects), are easily changed, and goods must be experienced before purchasing. In short, information product characteristics and cost structure (high production cost and low reproduction cost) differ significantly from those of conventional businesses. The value of information goods also varies and pricing strategies can be volatile [2]. The above description is confirmed by Czaplewski, stating that the most significant characteristics of information good is the fact that Information is costly to produce but cheap to reproduce. This is due to high fix costs and low marginal costs. Moreover it also implies that it's difficult to enforce intellectual property rights, as the trade in electronic copies is hard to control. Czaplewski also stresses that information goods are experience goods, as a consequence it's not possible to make an opinion on the quality of information good without consuming it first. Closer inspection of the quality of such goods on the other hand, is related to incurring relative high costs, for example, in the search for opinions on the particular good. The increasing supply of information, which results from technological advances, is bumping into the barriers of information overload by consumers unable to assimilate new information due to time constraints [3].

It's important to notice additional properties such as substitution and complementary effects of information. A perfect complement of information good is much more common than in other asset domain. It's common to have a zero

value of one information good without another supporting it. The best example can be found among software packages, where additional passwords and keywords are required in order for the software to become fully functional. Another example is a common story of a treasure hunt, where one half of the map leading to the treasure is worthless without another [5].

3. Information economy and business strategies

As mentioned earlier in this article, Shapiro and Varian identified a number of effects and models for companies operating in the information goods industry, which in this paper will be called economic strategies. It's important to stress, that a company need not be sticking to a single strategy, but the strategies can be used simultaneously. The main economic strategies identified by Varian and Shapiro are: price differentiation, product versioning, bundling, switching costs and lock-in effect, network externalities and standards. Below is a description of those concepts with explanation of how they have been applied to the analysis.
Differentiation of products and prices

According to Varian, if all customers for the product place essentially the same value on the product, the profit-maximizing pricing decision is easy: just price the product at this common value and charge what the market will bear. The difficulty arises when consumers' willingness's to pay are heterogeneous. In this case the producer's choice is not so obvious, since fewer consumers will buy at higher prices. Furthermore, if willingness-to-pay differs across customers, the producer would generally find it advantageous to charge different users different prices. This will be true even for a producer who is only interested in cost recovery [17].

Price differentiation, also called price discrimination results directly from very low marginal costs, where charging above marginal costs becomes immediately visible in the form of increased profits. Moreover, by using the latest technologies such as the Internet as distribution channels in conjunction with Big Data analysis of consumer behavior, it becomes possible to cheaply adjust the pricing to the needs and choices of consumers.

As Varian mentions with respect to designing information goods, the first point is to make sure to design the product so that it can be versioned. That is, the produce should be designed in a way that it is easy to reduce its quality in order to sell to a particular market segment. He further states, design for the high end of the market first, and then downgrade the product to get the versions for other segments of the market [17]. According to Linde, there are several empirical studies, according to which at least three versions should generally be offered [16]. At least three versions, as customers tend towards the middle, avoiding extremes. If customers only have a choice of two offers, they frequently decide in favor of the more reasonably priced one. On the other hand, if there is an extra High-end-,

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Gold-, Maxi- or Premium-Version this promotes the purchase of the middle one - erstwhile the most expensive version. With the introduction of a third, high-quality version it's not necessarily about selling these in large quantities, this however, changes the perception of the customers regarding the more favorable versions and encourages low-end buyers to decide in favor of the higher-value (medium) product. Thereby, the products in the middle attain acceptability [9]. In the analysis, versioning and price differentiation is reflected in the availability of several versions of the same information good. Price discrimination can also be observed in the number of licenses purchased. Bulk buying of licenses attains lower prices in the form of coupons or discount codes. Due to the fact that the producers and resellers of information goods, such as tutorials, templates, ebooks or 3d models, do not sell commodity goods, this often leads to significant market power over pricing strategies. They try to adjust as much as possible to customer demand through product and price differentiation.

3.1. Lock-in effect and switching costs

Lock-in effect usually takes place due to high switching costs. Users of information technologies are notoriously subject to switching costs and lock-in: once you have chosen a technology, or a format for keeping information, switching can be very expensive, Lock-in arises whenever users invest in multiple complementary and durable assets specific to a particular information technology system. [13]. According to Farrell, switching costs arise when a consumer makes investments specific to buying from a firm, creating economies of scope between buying different goods, or (especially) goods at different dates, from that firm. The consumer then values compatibility. If this lock-in is strong enough, a buyer is effectively buying a series of goods . Not surprisingly, sellers sometimes accordingly offer "life-cycle" contracts. In this case nothing is fundamentally new: with strong enough relationship-specific economies of scope, competition is naturally over bundles of goods rather than over a single good. [6].

Singh considers loyalty programs to be the most important aspect of e-commerce strategy for achieving customer lock-in. According to Singh, loyalty programs are becoming more and more common, as information and the Internet allow them to be fine-tuned more and more, information on consumers can be collected, processed and stored much more effectively. In addition, they have an attractive feature that other lock-in strategies may not share: the lock-in is achieved with the active participation of the customer, who signs up, and then enjoys the challenge of maximizing her loyalty points. Loyalty programs permit enormous flexibility. They can be adjusted over time, and they can be used in various kinds of cross-promotions. Earning frequent flyer miles by staying in particular hotels or by using a particular credit card are common examples. Other firms may therefore buy into share of the loyalty program, without having to run an independent

program, though that is an option that more hotels are choosing, for example [14]. Both Farrell and Singh stress the importance of building strong recognizable brand for increasing the loyalty and lock-in of the customers, by making search for alternatives costly and unattractive.

A different approach is taken by Biglaiser, who points out that analysis shows that information on the distribution of switching costs, for which no data is given, should have been gathered and that its consequences for the strategy of the entrants should have been considered. He also gives an example of Apple and the music industry, the heterogeneity of switching costs could be beneficial to Apple not so much because it implies that there exist a subset of consumers with very high switching costs, but rather because the presence of customers with low switching costs makes an aggressive pricing strategy potentially very costly for an entrant [1]. The lock-in effect and switching costs in the analysis, are usually reflected in loyalty programs and membership access. Additional incentive is given by the fact that the price level often depends on the length of participation in the loyalty program.

3.2. Bundling

Bundling arises when information goods are sold along physical goods, as an example: CD's and DVD's are sold along those lines. However, this is not a rule, as two separate information goods can also be bundled together, like MS Word and MS Excel in the MS Office software package. The problem of bundling had been extensively studied by Derdenger, he found that bundles are treated as separate products (distinct from component products) by consumers. In his studies, he also found that bundles attract some segments of consumers to advance their purchases, and others to enter the market when they might not have otherwise in addition and independently of the fact that bundling reduces consumer heterogeneity in valuation [4]. Similar facts have been established by Olderog and Skiera [11]. In the analysis, bundling of information goods can be attributed to sales with both physical good, as well as, to sales with another information good, as is the case with software packages.

3.3. Network externalities and standards

Demand-side economies of scale are also known as "network externalities" or "network effects," since they commonly occur in network industries. Formally, a good exhibits network effects if the demand for the good depends on how many other people purchase it [18]. Another classic examples of network effects are to be found in social media such as Facebook or Twitter, where the utility of any such social platform increases with the number of users. The same phenomenon applies to search engines such as Google or Bing. In his papers, Linde goes even further,

stating that versioning like bundling supports the speedy circulation of information goods and therewith the emergence of network effects [9]. In the analysis, network externalities are directly related to the YouTube search algorithm, based on PageRank, which assumes, that the more the video and YouTube channel is visited, the more popular it must be, and therefore it is placed higher in the search list for future seekers of content. As the page rank of such video o YouTube channel increases, the number of viewers and subscribers goes up as well. The more subscribers for a particular the YouTube channel, the more potential customers can be drawn in to the sphere of influence. In order to achieve high network externalities it is often required to introduce standards. For instance, for the mobile phone usage to become useful for ever growing number of people in the form of network effects, a network standard had to be introduced. In the analysis network externalities are reflected in the willingness to extend the number of viewers and subscribers of YouTube channels under scrutiny. In our case, YouTube channels are primarily used as a promotional medium for sales of other information goods. In order to acquire many subscribers to the channel, and building potential buyers base, a company needs to constantly expand its number of free videos, free tutorials, and other means that attract attention of many viewers. Standards are also reflected in a way a YouTube channel is maintained. This includes professional logotype, unified offer, attractive front banner, and promotional videos, which accompany the sold information goods.

4. Analysis

The research focuses on companies in the information goods sector, dealing with production or trade in video tutorials, templates, 3d models, music, ebooks and etc. In order to narrow the scope of the research it was decided to isolate a group of companies operating in the field of graphic software After Effects (AE) and Cinema 4D (C4D). AE and C4D is a professional software for video editing and 3D graphics. The reason for choosing both software AE and C4D is high complementarity of the two graphics packages. Excluded were direct providers of the aforementioned software.

Only the entities that operate in the business environment of the software are taken into account, for example, independent firms that create or trade in training workshops for AE or C4D, ebooks, ready-made templates, graphics, belong to the research group. Companies in graphics and movie entertainment industry, most commonly use YouTube channels in order to promote their products which constitute information goods.

Each entity sought is represented by a single channel on YouTube – a service which belongs to Google (Alphabet). Each entity must be a going concern, and exist on the market, promote themselves on YouTube a single channel and offer information goods for at least one year. The main search algorithm in this case is the YouTube algorithm, which returns results in the numbered order of relevance and relationship with the keywords sought. The first stage of the study is therefore to find as many YouTube channels which represent online firms. The algorithm returns 20 results per page and the number of pages displayed is dependent on the total number of hits. The main keyword used in search for companies represented through the YouTube channels are the following: After Effects tutorials, and combinations thereof, and cinema 4d tutorials and combinations thereof.

The study adopted yet another additional assumptions. Search for companies will be carried out through YouTube channel search, therefore the YouTube account needs to be active, meaning that at least one video had been published (not necessarily paid) in the last year. YouTube Channel maintained in a professional state, which presupposes the existence of neat graphics on the main banner and an individual avatar of the company. The language in the study is English.

Selection and exploration of companies corresponding to all the assumptions was conducted up to the fifth sub-page in the YouTube video rank for individual keyword, which gives a total overview of around 100 companies per keyword. Due to the good performance of YouTube search algorithms, further review of companies beyond the first 100 channels seems to be pointless, since what's left are mostly private channels, or channels not related to the topic.

The final study group represents 73 entities meeting all the above criteria in selling information goods related to AE and C4D software. This includes 44 entities for AE and 29 entities for C4D. Out of the above stated number of companies, 23 were manually eliminated due to the lack of sales, leaving the final group of 50 entities involved in production or trade in information goods.

In the course of the analysis, it was assumed that the number of subscribers of each YouTube channel represents the popularity of the channel, and translates to higher number of publicity and potential clients for the company selling information goods. The research in the use of the aforementioned economic strategies by the various entities producing or trading information goods, had been developed and presented in the form of a matrix.

Table 1 presents the number of economic strategies employed by companies specializing in production and trade of information goods related to the AE and C4D software.

Table 1. Economic strategies used by companies in the information goods industry

Lp	Nazwa	Subscriptions 09.11.2015	Price discrimination	Versioning	Bundling	Lock-in	Network externalities	Standards
1	The CGBros	615496					x	x
2	Lynda.com	336358	x	x	x	x	x	x
3	PushedToInsanity	278244	x	x	x	x	x	x
4	thevfxbro	232077	x	x			x	x
5	Video Copilot	221919	x	x	x	x	x	x
6	Mt. Mograph	135159	x	x	x		x	x
7	ECAbrams	133156	x	x			x	x
8	After Effects Tutorials w/ Mikey	108115	x	x	x		x	x
9	MaxonC4D	96738	x	x	x	x	x	x
10	finalcutqueen	94901	x	x	x		x	x
11	Pluralsight Creative	86131	x	x	x	x	x	x
12	O'Reilly - Video Training	71685	x	x	x	x	x	x
13	VinhSon Nguyen	55031	x	x			x	x
14	PremiumBeat.com - Royalty Free	50434	x	x	x	x	x	x
15	Dan Stevers	44961	x	x	x		x	x
16	armaganvideos	38847	x	x			x	x
17	Tom McCoy	38055		x			x	x
18	fxchannelhouse	28494	x	x			x	x
19	mymotiongraphics	28365					x	x
20	Tutorial Market	23184	x	x			x	x
21	VidMuze	22341	x				x	x
22	MotionMile	18121		x			x	x
23	AqatixOfficial || Tutorials (2ND Cl	17183	x	x			x	x
24	GreyscaleGorilla	16499	x	x	x		x	x
25	Psynaps	16379	x	x			x	x
26	Dustin McLean	16261					x	x
27	Noah Qehzy	15301		x			x	x
28	Mrjubble	15294	x				x	x
29	FX HIVE	13506	x				x	x
30	Rory Martin	13012	x	x			x	x
31	HEYPRESTO2010	12222		x			x	x
32	mamoworld.com	9824	x	x			x	x
33	BlueFx After Effects Templates	6537	x				x	x
34	Nelson Designs	5686			x		x	x
35	eyedesyn	5599					x	x
36	Flawless Films	5551					x	x
37	PixelBump	4783		x			x	x
38	FutureArtist	4265					x	
39	3DFluff	4248	x				x	x
40	FluxVFX After Effects Templates	3315		x			x	x
41	Real Motion	2981		x			x	x
42	CG3DANK - CG and 3D tutorials - m	2673					x	x
43	Navié	2527	x	x			x	x
44	SonduckFilm	2471		x			x	x
45	Toolfarm Inc	2211	x				x	x
46	motionsquared	2011					x	x
47	Creation Effects	1535		x	x		x	x
48	c4dtraining	912					x	
49	After Effects Templates	855		x			x	
50	PowerPoint & After Effects /w An	671	x				x	
	Total		30	33	14	7	50	46

The analysis of the table shows that most companies use the network externalities effects, as well as, use standards. The next position in terms of number of strategies used was price discrimination and versioning. Both strategies are reflected in scaling the versions of products and price, in order to extend the client base willing to purchase the goods.

The least frequently represented economic strategies among the analyzed entities was the bundling and lock-in strategies. The reason may be the fact that these are the most advanced and expensive to implement strategies for companies, often requiring adequate technological infrastructure.

Table 2. The relationship between the number of strategies
and the number of firms

Number of strategies	Number of companies
1	2
2	9
3	15
4	12
5	5
6	7

Analyzing the number of economic strategies used by individual entities, one can see the approximate normal distribution, however, included outliers. The highest number of companies 15, employ 3 strategies simultaneously. Subsequently 12 companies make use of 4 strategies at the same time. The exception in the 7 companies that utilize the highest number of economic strategies, which is 6 simultaneously.

5. Economic strategies and popularity of the channel

The next stage of the research was to compare the popularity of individual YouTube channels and confront it with the number of economic strategies used by individual company. The popularity of YouTube channels is best described by the number of subscribers. Subscribers are composed of individual YouTube users who want to be kept updated on the latest presentations of the channel. The same position in this matter is held by the YouTube, which measures the popularity of channels by the number of subscribers and the amount of time spent on it, in

contrast to the views of individual videos. A larger number of subscribers, provides for a larger number of potential customers interested in the subject promoted on the YouTube channel.

Correlation coefficients are used in statistics to measure how strong a relationship is between two variables. Using the statistical package R, correlation coefficients were calculated between the number of subscribers for each entity, and the number employed economic strategies, in accordance to the three most common methods of calculating coefficients. Since the data contain outliers and the Pearson correlation measures linear relationship, hence the correlation coefficient calculated with the Pearson method gives the weakest result. Spearman correlation coefficient is more general than Pearson. According to Laerd, the Spearman correlation can be used when the assumptions of the Pearson correlation are markedly violated. It is also worth noting that a Spearman's correlation can be used when your two variables are not normally distributed. It is also not very sensitive to outliers, which are observations within your data that do not follow the usual pattern [8].

Table 3. Calculation of correlation coefficient with different methods

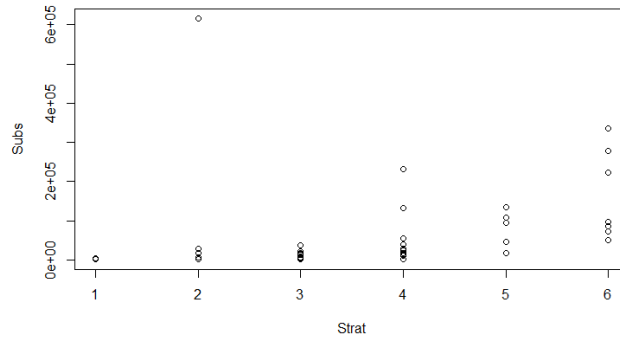| cor(SubData, method='spearman')		
	Subscribers	Strategies
Subscribers	1.0000000	0.6635036
Strategies	0.6635036	1.0000000
cor(SubData, method='kendall')		
	Subscribers	Strategies
Subscribers	1.0000000	0.535021
Strategies	0.535021	1.0000000
cor(SubData, method='pearson')		
	Subscribers	Strategies
Subscribers	1.0000000	0.3124468
Strategies	0.3124468	1.0000000

Figure 1. Graph showing the dependence of the amount of subscribers
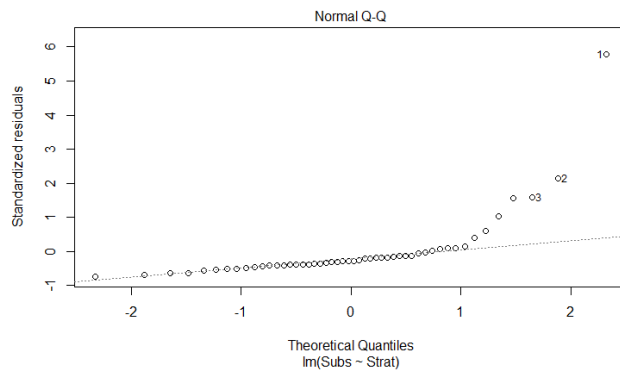and the number of economic strategy

Figure 2. Chart showing test for a linear relationship, which confirms the selection
method other than Pearson, as part of the observation are outliers

In this example, Spearman's correlation, among other methods, provides the best result confirming a positive correlation and dependency, with the outcome of 0.6635036.

6. Conclusions

The research conducted in this paper shows that there is a relation between the number of economic strategies used by companies in the information goods sector, and the number of potential clients for their products represented in this research by subscribers. The outcome of the correlation is positive, of average strength due

to outliers. However the important point in correlation is that we cannot make any assumption about cause. By looking at the number of companies using each strategy, it can be noticed that building network externalities is the most common economic strategy, each entity undertakes without regard to its size or resource. This implies that companies are more inclined to set up a stable subscribers base first, meaning the potential customers, and then monetize the clients with ever more advanced economic strategies. The research revealed that the most common economic effect used by firms in the information goods sector related to software, are the network externalities closely followed by standards. The least common was the lock-in, followed by bundling. The last two belong to the most expensive strategies to implement, involving high costs of implementation and system knowledge. The support for lock-in strategy in information goods, often requires the maintenance of advanced content management system with access controls and integrated payment system. That is mostly too high of a burden for most smaller entities. It's also interesting to look at the entities utilizing all 6 economic strategies at once. In three cases, those entities boast between 200,000 and 330,000 thousand of subscribers. The next three cases have between 70,000 and 90,000 subscribers. Only in one case there is around 50,000 subscribers. For companies using 1 or 2 strategies simultaneously, the number of subscribers oscillates between 600 and 28,000. Only in one case which is an outlier the number exceeded 600,000 which at the same time is the highest number of subscribers in the research sample. However, in the author's opinion, due to the fact that almost all companies employ standards, and network externalities to build the client base, it can safely be stated that higher number of potential customers may require a more advanced approach to selling and locking in customer loyalty, therefore it requires more advanced actions from the companies involved.

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