

**PROTECTING THE OFFERING FROM UNFAIR COMPETITION IN THE KNOWLEDGE ECONOMY - DESIGN MANAGEMENT IN VIRTUAL ENTERPRISES**

Sarah Philipson, Assistant professor in Marketing  
School of Management and Economics, Växjö University, Sweden.  
Email: sarah.philipson@vxu.se

**Abstract**

The future wealth of the industrialised world is based on the design and marketing of new products and services. To an increasing extent design is based on the co-operation of numerous companies and experts in technology and content. The variable cost of the production of the product or service is a smaller and smaller share of its price. Hence the protection of embedded intellectual assets is becoming a critical aspect of all business ventures.

In this paper I propose a technological environment ("environment" is used in the information technology sense) for design in complex networks of independent companies and experts. An environment intended to make the protection of intellectual assets possible and in which the participants can build trust between each other for the common exploitation of assets owned individually and jointly. The environment, so far not tested, is based on my 25 years of experience as executive officer and management consultant in the media, telecommunication and engineering industries. I hope to test the environment in future research.

**Setting the scene**

Mobile telephony is a complex technology. The mobile phone is of little value if we only can call those with the same telecom operator. And an operator would not place itself in the situation where it is depending on for example Ericsson as a monopoly supplier.

The solution was (for this standard - new standards are in development all the time) that the prospective competitors in supplying such a technology sat together in a standards body to define a common standard (e.g. the 3G standard), thus creating interoperability. The customer can call his friend even if she doesn’t have a phone of the same brand. And the operators can choose between several suppliers, not being locked in with a monopoly supplier. The suppliers are by co-operating creating a market place that would not have been there without this cooperation in developing standards.

But in order to realize the standard, technology is needed. Most technology was already developed and was patented by its owners. Ericsson might have two
important patents, while Nokia have another one. Even IBM, not even part of the standards body and not having any intention of competing in the mobile telephone terminal market, might have an important patent. Then these rights holders created a patent pool, making it possible to realise the previously developed standard. All the companies that wanted to compete in the newly created market place could now license the necessary technology from the patent pool in order to create their own concrete offerings (specific realizations of the standards, based on these patents). They pay a royalty to the patent pool, which distributes slices of these royalties to the original patent owners. The standards body/patent-pool is a virtual enterprise for designing a new meta-offering, the 3G mobile telephone terminal.

Introduction
A fundamental and urging issue for the European Union is that in the knowledge based economy a large part of the production of products and services is outsourced. Not the outsourcing just to gain some centimes in cost, but the outsourcing of wintelism, see Hart, J.A. & Kim, S. (2002), where market mechanisms are introduced not only to reduce the costs of producing components but also for finding smarter solutions. Wealth has to be created by the design and marketing of these products and services. This paper raises the question of how to protect designs from unfair competition and plagiarism, already at the very beginning of the design process. Further how to manage the design effectively and finally how to exploit the intellectual assets emerging from the design process.

![Management foci](image)

**Figure 1: Changing focus of management attention**
In early capitalism 80-90% of the price of a product or a service was the cost of its production. After the Second World War supply has often been higher than demand. Hence, resources where allocated to product development and adaptation and to marketing. As a consequence the production cost sunk towards 50% of total price. Today the production cost is in many industries less than 10%. This is the case for Lacoste shirts, Music CD’s, laptop computers and mobile phones, to name a few. This development was also the result of continuous efforts to decrease costs, to stay competitive. As different costs where “beaten down” by management efforts, new costs have come to focus.

A larger and larger part of the total price consists of costs for designing products and services. Products and services are adapted after still smaller target groups as well as the communication of these offerings. Design and communication activities are becoming more and more important, representing a bigger share of total costs, in most cases being the essence of competitiveness.

Since the cost of production is such a small part of the total cost and of the price to the customer, the question of how to protect the offering from unfair competition through copying becomes a very important problem for companies. This problem becomes more complex to handle, as companies in the modern knowledge based economy have to cooperate with many other companies in order to design and realize these offerings. Design is often made in virtual enterprises, where individuals from different organizations cooperate in teams or complexes of teams. Examples are when Volvo shall create a new car model, involving their own R&D team as well as companies like Bosch, a motor factory jointly owned with Renault and an Italian car body designer.

Already in the design of the offering the immaterial assets that are constructed must be managed. Different cooperating parties initially have to contribute with so called background rights as a prerequisite for the design project. Contracts have to be entered concerning who will own what of the expected results of the project, the so-called foreground rights. They also have to be entered as to allocate the use-values of the project to different participating actors. Both background and foreground must be protected already during the design processes. Depending on the “fragility” of the right, the security in and access to the design environment must be managed; otherwise third parties may legally copy the results.

**Perspectives on Design**

**The difference between design and ”giving form”**

The Merriam-Webster Online dictionary (http://www.m-w.com/dictionary.htm), defines design with a complexity of references to related words give an open determination of design to be a very all-encompassing human activity, as seen in the following figure:
Figure 2: The many determinations of the word design

In Sweden the word ”formgivning” is often used as synonymous with design, but as the translation, ”giving form”, makes clear that it is implicitly implying giving form to an already existing essence, hence potentially more limiting than the word design, which includes the possibility of creating essence.

Within the field of design the word design is defined in two extremes. Walsh et al. (1992), p. 16, defines design as:

”…the configuration of materials, elements and components that give a product its particular attributes of performance, appearance, ease of use, method of manufacture, and so on.”

This definition poses design as process of giving form and is rather physical in its esprit.

von Stamm, B., (2003), s.12 has a much wider definition:
“Design is the conscious decision-making process by which information (an idea) is transformed into an outcome, be it tangible (product) or intangible (service).”

This later definition lets design encompass almost all activities in a company, giving the discipline of design management the same field as business administration. It is preferable to give a more limited, although still wide, meaning of the word design.

**Twice confronted with the customer**

![Diagram showing the process of business, design, and product realization](image)

**Figure 3: Determination of Business, Design and the Realization of Products and Services**

A company involves different functional activities, sometimes organized in functional departments.

The first activity of marketing is to find out what the customer wants or needs. This activity is often called value analysis. Its end result is a proposed competitive profile of the product or service, here called a “Needs structure”. This structure could be the result either of specifications given spontaneously by customers, information collected by the company in focus groups or queries or made by insightful representatives of the company itself.
Next comes the functional activity of construction/design, the first realization of the needs structure, making a prototype. This process is often called design in a limited sense.

The structure of this prototype, the construction structure, has to be modified to be producible by the company. This activity, making it possible to produce the product or service in series, is necessary to realize it for reasonable costs. This procedure often involves what is called a 0-series. This is the pre-production structure, showing that the product or service can be done by the existing or only slightly modified production apparatus and with the help of existing or easily accessible suppliers.

In order for the company to actually be able to produce the product or service it has to be integrated with existing work schedules, deliveries from suppliers, etc. This is the production structure, in which production department makes the pre-production structure its own.

Finally marketing decides if it is worthwhile to sell the product or service, if the actually realized offering is competitive or not. It includes it in the selling structure, possibly limiting or extending (by third-party products, services or plug-ins) the offering.

It is as such that offering meets the customer in “the moment of truth”, Norman, R. (1983), page 168.

![Figure 4: Walsh’s "Rugby team"
Walsh et al. (1992)](image)

Normally this process leads to a gradual restriction of the possible offering. In order to open up the process and speed-up the time to market, Walsh et al. (1992) points out that companies use parallel and coupled processes.
I determine design as consisting of the processes resulting in the needs structure, the construction structure and the pre-construction structure. It could also be said to be the processes from the idea of a new product or service up until it is possible to put it on the market, the processes that determines the time to market.

**The Virtual Enterprise**

Small companies have been limited to the development of intellectual property that is the brain product of a single or very few individuals. The Internet and modern middleware has changed that. It is possible to develop very complex software as open source, where a community of developers developing more and more complex software. Even though MySQL, the biggest open source database program, developed by a Swedish enterprise with the same name, [www.mysql.com](http://www.mysql.com), is much less sophisticated than Oracle, it is not unreasonable to foresee that some open source software will become as – and even more - complex as proprietary alternatives. Due to the nature of the revenue streams, open source software is however often exploited in a multitude of small companies. And it has so far not been shown that this structure makes it possible to exploit the full potential of such intellectual property.

An alternative (and sometimes a complement) to open source software is middleware. This makes it possible to develop small software components, which are of limited interest as stand-alone programs. But via standardized middleware these components are able to seek up a multitude of complementary components in order to be able to execute more complex tasks for the user. At the forefront of such development has been Commercenet, [www.commercenet.com](http://www.commercenet.com). However, so far it doesn’t seem to have produced very successful assets.

As an alternative to big corporate efforts, the Internet facilitates another phenomena, with a much bigger potential for production and exploitation of intellectual property: the virtual enterprise. The virtual enterprise doesn’t necessarily need the Internet in contract outside resources in order to present them to the outside world as a new incorporated whole. It can and has been done before Internet. This said in contrast to the position of the ALIVE project, “Information and Communication Technology (ICT) functions as a motor within the VE”, Van Schoubroeck, C., Cousy, H., Droshout, D. & Windey, B. (2001) But Internet brings critical new functionality to the virtual enterprise by real time assembling of outside resources.

The virtual enterprise is not necessarily a contrasting model to big business, which can use it as a feature of its own activities. But the significance of virtual
enterprising is that it gives small business the possibility to access economies of scale.

Michael Porter (1990) and Castells (1996) have shown the significance of local geographical clusters, in making it possible for small enterprises collectively becoming competitive on a global scene, by an evolved division of labour giving them access to excellence and economies of scale otherwise unattainable for them.

Actually the virtual enterprise is the generalisation of the ongoing differentiation of more and more complex value chains and the market as organising principle of all economic life. In the beginning of capitalism, when during the mercantilist era the enterprise was a monopoly granted by the state in a semi-feudalist manner, the business venture did everything from extraction of primary resources to delivery of the final product. The evolvement of capitalism as an economic system in its own right has differentiated complex value chains and lately value webs.

The relative stability of the industrial value chain made it possible for the relations between companies to evolve at a slow pace and with gradual evolvement of relations. What has fundamentally changed with the shortening of life cycles and the shorter time to market is that these relations have to evolve with a pace that approaches real time.

Increased competition at the latter half of the 20th century saw capitalist activity becoming even more complex than just cutting up the flow of value-adding activities that had created the value chain. Parts of the management and operations of these value-adding activities where outsourced on a large scale (typically information technology, logistics and advertising). The complexity increased with the Internet and with “Wintelism, see Hart, J. A. & Kim, S., (2002), creating loosely coupled systems out of previously integrated products. These three latter tendencies created the value-web.

Normally the virtual enterprise has a centre around which it evolves, the “virtual architect”. The virtual architect is not some theoretically constructed role for a consultant, but more often the company that wants to extend itself by building a virtual enterprise around itself.

The Virtual enterprise can have different characters
- A unified leadership, the corporate rationalizer as the Virtual Enterprise architect.
- A co-operative effort between commercial enterprises, the Virtual Enterprise architect as a facilitator of a common market place See the mobile telephone terminal
example above.
- Democracy between professionals

The virtual enterprise doesn’t exist in itself, but as entities interacting with other entities. The virtual enterprise in the Internet environment makes this clustering possible without the geographical dimension. The clustering principle will probably be shared value system of the participants, rather than social interaction in physical life. ”Trust is absolutely basic in order to get a virtual team to function.” Lipnack, J. (2000)

**Intellectual Assets**

There are three types of intellectual assets:

1. Those that without any activity by the creator are protected by intellectual property rights. (“Pure” copyright, Sui generis copyright – e.g. database protection, renowned trademark, etc.).
2. Those that can be protected by intellectual property rights by being registered (patents, new trademarks, patterns, etc. In the US also “pure” copyright).
3. Those that are not or cannot be protected by intellectual property rights but only by contractual law and/or as company secrets.

Companies using the intellectual assets protection in an advanced manner (Microsoft, Adobe and others), lie out a “bomb carpet” of different protections, together creating an effective defence against all competition in the ”vicinity” of their product portfolio. They also have different protection periods and different start dates for the protection. By continuously renovate parts of the protection they prolongs the protection of the whole. I call this ”interlacing” intellectual property rights.

In other cases companies succeed in selling intellectual property rights lacking legal protection. A large part of the trade with so-called formats or concepts for TV is based on the sales of ideas – which lack protection in Europe. In enforcing their market position, US companies has succeeded in forcing Europe to accept US law. You pay for assets that you strictly legally should not have to pay for, knowing that you would be excluded from the international market if you were not paying your “dues”.

The intellectual property rights are in essence an exclusive right – a monopoly right. This means that you are not allowed to copy the product during the time of protection.

**The Creation of Intellectual Assets**

Private property was creating a manufacturing industry in the midst of feudal agriculture, and later transformed agriculture to modern industrial agriculture –
for better or worse. In much the same way intellectual property is shaping a new type of industry and is transforming traditional manufacturing. Industries based on intellectual property rights are already the most important export industry in the US, even bigger than the car industry.

If intellectual assets can be protected under law or not, is not the issue. Even intellectual assets without legal protection could be defended:

• By market position, as in the TV broadcasting industry.
• By keeping ideas secret in exploiting them; as in some franchising concepts.
• Or simply by trying to be ahead of others in developing new ideas based on the old ones.
• There are even business models where one is giving away intellectual assets, in order to use them as a leverage to gain something else.

As intellectual property becomes more important than “physical” property the way to manage people also has to change. In the physical world the difference between the productivity of one worker and another could be counted in terms of percentages, 10, 20 or 30 % productivity differences usually distinguishes the good and the normal worker. Of course there are instances when one worker performs double another or even five times more. But in the case of building intellectual assets the difference could sometimes be as high as 1000 times more! “The nature of human life is that some are more creative than others. Picture archives are living on 300 – 500 pictures.” Interview with Chis Barlas.

That is why all industries has to pose themselves the same type of questions as the media industry has done for a long time:

• Through the Internet the possibility of distributing information has been revolutionised. This affects the possibility of exploiting and controlling intellectual property rights.
• New types of intellectual assets are becoming increasingly important and valuable. Business models, communication concepts, e-commerce solutions, methods and ideas. Though not always protected by intellectual property rights such knowledge and ideas are the number one asset for many modern companies. Thus making an intellectual asset strategy a central part of everyday business.
• The possibilities of protecting intellectual assets are increasing. This is most evident in the United States. Software, methods, solutions and even ideas can be patented.

Any commercial enterprise that wants to optimise its success in the information society must have a basic awareness and a strategy for dealing with the new
climate. The most important assets for today’s companies are not their machines or factories, but the creativity and knowledge of their employees. Companies must have a method for identifying, nursing and exploiting these intellectual assets.

So intellectual property rights are becoming more and more important. The technological advances that constitute the very basis of the information age explain this.

**Proposed principles for a working environment for the design in virtual enterprises**
The following specification is a hypothesis for some of the most important elements needed to provide a working environment for designing intellectual property in the virtual enterprise. A mock-up of this environment can be found at [www.sarahphilipson.com](http://www.sarahphilipson.com)

**Modules**

1. **Contracting**, or organising the virtual enterprise
   In order for the virtual enterprise to be competitive, it must be easy to organise and reorganise the enterprise by contracting and release contracted resources. The first module is intended to serve as a personnel and subcontracting unit. Senior management will identify the competencies needed to form a project team

2. **Trust**
   In order to build trust between contractors it is essential that to provide a secure environment that guarantees contracting partners that their work is not in vain. Build trust so that the emerging assets don’t move out of the virtual enterprise and can be protected by legal rights or secrecy (contractual or technical). This means a ”firewall” that handles security based on an ”organisational directory” and a ”work flow-program”. Functionality: Secure identification, based on smart cards and pin codes, fingerprinting and/or other biometric technology-identification.

2. a. **Organisational directory**
   In this module it will be possible to register a subject as member of project(s) and her role in them, thus defining the virtual organisation. This should be an ”organisational directory”, based on the X.500 standard, see Chadwick, D. (1996), where the modern project organisation is updated in real time. An LDAP-protocol will guarantee openness
   **Content of the Directory**
   In the directory is defined:
   - Projects.
- Roles in projects.
- Persons, assigned role.
- Organisation, to which the individual belongs.
- Security.

2.b. Security
The aim of the security system is to guarantee that only those subjects that have a defined right to access certain assets and to communicate with defined subjects can actually do that. The security manager parameterise the security modules so that anyone who accesses the virtual enterprise only get in touch with people and stuff that are within her authorised role (-s). The module is intended to service the risk management unit, thus securing business secrecy.

Sub-modules
- Firewall in order to deny unauthorised access.
- Strong Authentication in order to accept access; certification of identity by smart cards, biometrics, fingerprints digital signatures or other such technology.
- Role-based authorisation based on access to the organisational directory.
- Privilege Attribute based authorisation based on access to the intellectual assets management system.

3. Intellectual Assets management - Content and rights management
The environment must provide resources that make it possible to evaluate each contractor’s role in the creation of works, in order to find the best contracting partners for each project. Many of the intellectual assets used in the virtual enterprise are fragile, in the sense that it is perhaps not yet possible to protect them. The only way to protect such fragile assets is by contract law and by keeping them secret, at least until they have reached a level where it is possible to patent them, claiming copyright or design right, etc.

The intellectual assets management systems will define rights of access to specific assets based on definition of projects and roles within projects. This module is intended to support an intellectual assets development unit, where they source knowledge (often after hints from project teams), classify knowledge – on different levels of value-added - according to economic value and vulnerability, thus defining to which projects and which roles within the projects access shall be given. They further define what knowledge could be sold.

Sub-modules
A module for acquiring Intellectual Property Rights protected content (background rights) and the classification of the value and the vulnerability of that content. Rights management system – which has the right to access what content. The rights management system should be compatible with the Imprimatur, IMPRIMATUR (1995), specification and with the <Inðæc>,
www.indecs.org, events-based rights modelling meta-data architecture, which are the state-of-the-arts in rights management.

Different owners
The environment provides resources that make it possible to attribute different components of the total work to different contractors and that these different layers of rights are managed and manageable

Workflow management
The workflow management system is a system, by which progression of projects can be automatically planned and supervised, by project members, project managers and general management. In this module the project manager shall have access to project planning system (-s). Project members should be able to report time and costs and the system should automatically track when tasks are fulfilled and the process is moving forward. The project manager should be able to follow up and report her project to senior management. The model should automatically supply information to financial systems.

Sub-modules, defining:
- Project planning.
- Documents.
- To which project a document belongs.
- In which phase in the project the document belongs.
- Which roles that shall have access to the document in which phase.
- Time reporting.
- Date and Time stamping, by watermarking a document with the time of transferral to new (sub-) tasks and/or project member (start and finish of phase).
- Cost reporting.
- Follow up.
- It will supply financial systems and “salary administration systems” with data
- It should be provided on TCP/IP and be www-compatible
- It should be platform independent

Knowledge management
In the virtual enterprise it will be even more important to identify unique talents in developing intellectual assets and leaders. But it will also be more difficult to manage than the traditional enterprise. By logging use of content and communication and visualise the system it will give essential information to identify talents and informal leaders. The module is not intended to be a tool for surveying employees, they should have the possibility to communicate and access content without being logged. However, it should be suggested to them that they are expected to accept logging of their job-related traffic

Sub-modules.
- Logging content push.
- Logging content pull.
- Logging communication.
- Analysing authorities and hubs in order to identify talents and leaders.
- We propose to use software that visualise logged information and find authorities (knowledge centres) and hubs (information centres).

**An environment for exploitation**
The exploitation of intellectual property has traditionally been based on strong marketing efforts. These resources are often inaccessible for the small and medium size enterprise. Traditionally they had to give up their rights to companies specialized in such exploitation. Not only authors had to do that, but also small and medium sized publishing houses. They had to give up their business or at least large catalogues of rights to the bigger publishing houses. Compared to most physical value chains intellectual property is extremely concentrated.

Environments for the exploitation of the works developed in virtual enterprises also have to be developed. These could be of four different types:

- Exploitation by the virtual architect.
- External exploitation.
- Value-based external exploitation.
- Internal exploitation.

**Exploitation by the virtual architect**
This is the presently most common model. Volvo organizes a virtual enterprise to design a new car model. They involve an Italian design consultancy firm, a jointly owned motor factory, Bosch, etc.

**External exploitation**
Big corporations or venture capitalists either buy the works outright or with a large slice of the profit on its exploitation. Alternatively they buy them with a mixture of an outright, down payment model and a revenues or licensing based model. Such exploitation would either demand intermediaries that found such investors for the virtual enterprise, or a marketplace where the investors could reach opportunities in virtual enterprises directly. The standards body/patent-pool example in the beginning of this article is essentially such an external exploitation vehicle.

**Value-based external investment**
An third models for financing exploitation could be venture capital like the “ethical” founds investing in everything but tobacco, alcohol, game, etc.- whatever their value system. Here they would have the possibility to invest in something for what it is, rather than for what it is not.
An internal model
An internal model would be very demanding; conditioned on the development of dedicated savings banks, as in the Mondragon, see www.mondragon.mcc.es, co-operative, or employees’ credit unions. Such a development would take time and is not likely to evolve immediately.

**Further research**
The plan is to start a bigger, action-oriented research project where the robustness of this environment can be tested and the behaviour of different actors can be analyzed. Hopefully making it possible to validate the underlying assumptions of the specification.
Figure 5: The Design Management Process
References
1. Alsop, Stewart, *Copyright Protection Is for Dinosaurs*, Fortune, Magazine Issue: April 26, 1999 Vol. 139, No. 8


30. London School of Economics, *Convergence within the media industry, and between media, information technology and/or telecommunications – prospective for competition and competitive policy*, December 1996.


**Internet Sources**

- [www.mondragon.mcc.es](http://www.mondragon.mcc.es)
- [http://www.m-w.com/dictionary.htm](http://www.m-w.com/dictionary.htm)
- [www.indecs.org](http://www.indecs.org)
- [www.sarahphilipson.com](http://www.sarahphilipson.com)
- [www.mysql.com](http://www.mysql.com)
- [www.commercenet.com](http://www.commercenet.com)

**Interviews**


5. Ingrid Dahlberg, at the time CEO of Dramaten, the Swedish national scene. Interviewed the 10th of October 2001.

Figures

Figure 1: Changing focus of management attention ......................................... 2
Figure 2: The many determinations of the word design .................................... 4
Figure 3: Determination of Business, Design and the Realization of Products and Services ................................................................. 5
Figure 4: Walsh’s ”Rugby team” ....................................................................... 6
Figure 5: The Design Management Process ..................................................... 16