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Industry trajectories of change

Industry Analysis of the Digital Video Player industry

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Executive summary

This thesis draws upon theory from strategy management theory. More specifically it draws upon strategic position and dynamics theory. It applies a strategy oriented perspective to define current and new industries and narrow in their boundaries. The thesis theoretical foundation is build upon industry dynamics theory combined with theories on sustaining competitive advantage in network economies.

The thesis constructs an managerial model based upon the above mentioned theories. The model can be used to measure and evaluate an industry's evolutionary trajectory and to align the industry's assets and activities to the phases of industry convergence by creating new value in form of partnerships, standards and complementors.

The managerial model is then used for an real industry analysis on the incumbent physical disc based digital video player industry and the emerging industry of digital media players to understand if the model can be of use in a real world setting.

The analysis based on the model concludes that the firms in the incumbent industry are facing threats to their core assets and core activities from IT hardware firms. These companies that are emerging are offering digital media players that are based upon non physical discs which in some aspects offer better performance than the incumbent industry's products. The incumbent are under threat of being substituted by the new products that cater to the same demand, but the products are coming from other the emerging industry with uses different buyers, suppliers and complementors. Thus, the companies are seeing that their industry current assets and activities are being threatened by the other industry's emergence. This changes their industry evolution to be on a radical trajectory where the stage of evolution in it's convergence phase.

The analysis concludes that it is most urgent that firms in the incumbent industries validate their current industry evolution and use the findings from the analysis to align their assets and activities and creating the necessary partnerships and complements with other firms in order to stay competitive in the future.

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Chapter 1

Introduction to the Thesis

1.1 Setting the scene

Competitive industry analysis often takes place by defining the industry and its boundaries and then taking a closer look at the competition between the industries players, and analyzing buyer and supplier relationships. But not many models describe the process where industry boundaries are collapsing, where the producers of substitute products come together and form a new industry.

This thesis tries to understand this type of change in the industry evolution by constructing a managerial model based upon main theory branches of strategy management. Drawing on theory within strategy management, using dynamic industry analysis (McGahan, 2004), to define a Industry boundaries and strategic position in industry evolution. Following the theory on how to sustain competitive advantage for the industry and the firm by creating first mover advantages (Lieberman) such as trough network externalities, and from that standards. (Shapiro & Varian 1999) This framework is useful for firms where the boundaries of their industry is collapsing and converging with other industries.

Empirical evidence to support the significance of this model is provided by a industry analysis of two industries using the constructed managerial model. The industry analyses, analyzes the current industry trajectory of firms in the incumbent industry of Consumers electronics producing physical disc based video players and the emerging industry of IT Hardware firms that produces non physical disc digital media players.

1.1.1 Purpose of the thesis

The primary interest of this study is to understand how the firms become ready to manage the consequences of changes in their industry trajectories. This examination becomes relevant because firms need to understand their industry in life cycles, by looking not only at their own

inherent industry, but also determine if new ways of doing business comes from other industries that are substituting and changing their own industry trajectory. The need for building partnerships and standards create an additional angle toward how to cope with industry evolution. Therefore mastering industry evolution requires a combination of tools that a firm will need to analyse its industry and its potential partners and new competitors with.

1.1.2 Main research question of the Thesis -

Theoretical

How can the firms assess the type of trajectory change in their industry to understand if the change is threatening its core activities that generates profit for the firm and if the change is threatening its ability to generate a return of investments on its core assets. How can firms respond and align to these changes in order for it to remain competitive?

How can one construct a managerial model based for firms to use in their strategy formulation and business execution to assess core assets and activities and the need of partnerships and complements to stay competitive in their industry if it is converging with other industries?

How can firms that participate in the market of digital consumer video players to consumers, apply the managerial model on their industry to assess if core assets and activities are coming under threats of generating profits and revenue from emerging industries?

1.1.3 Delimitations

The central objective of this analysis is to understand the changes happening in the industry of the digital video player industry. The scope of the analysis will not be discussing the structure or the economic fundamentals of the Consumer Electronics and IT hardware industry.

1.2 Methodology

The thesis takes an overall theoretical point of departure supported by an empirical application. More specifically, theoretical analysis is used to develop a managerial model to be used on the specified industry analysis, thereby answering the research question of the thesis. Moreover, the empirical research is used to uphold the theoretical reasoning, creating an interwoven application of theoretical and empirical research. This fusion between theoretical and empirical research will be elucidated for the reader in the present section, where methodological guidance validated to clarify the research process of this thesis.

1.2.1 Target Reader Group

Managers and practitioners in the field of industrial organizational economics and industry dynamics, and managers in the industries that could be facing changes in their industry evolution in the computing, entertainment and communication field of business. Investors and financial analysts in the field of these industries can also leverage decisions using the thesis's recommendations.

1.2.2 Data Collection

The thesis is based on the triangulation of three categories of empirical data and information. Firstly, I have collected information on the history, product and technology offerings. I have studied the standard creation process and network formation of a large number of consumer electronics and IT hardware companies by studying their homepages, press releases and online debate forums on the firms and their products. The studied companies include, among many others, Sony, Toshiba, Sigma Designs, Syabas, Linksys, Western Digital, Netgear and Xtreamer.

I have furthermore reviewed a large number of in-depth research reports on the Emerging Digital media player device industry from a wide range of different consulting and investment firms, including Park Associates, CIBC Oppenheimer, Jupiter research; I have obtained access to these analyses through the Intel & HP Market Intelligence portal. Intel and HP where I was employed in a period allowed me to access these sources. Invaluable insights on new trends in the emerging Digital media adapter industry has also been obtained from interviews with leading vendors such as Linksys/K.I.S.S. Technology, and from trade journals in the field published such as EEtimes.com, Digital home review and Business Week.

1.3 Structure of the Thesis

1.3.1 The structure of the thesis

This thesis try to give a contemplated investigation on how firms facing change in their industry evolution and their industry should align their investments and craft strategies in accordance. The thesis is divided into 5 main interrelated parts, starting with an in depths discussion of the theories, followed by the strategic model to apply, then an overview of the convergence of the digital home, continuing the next parts, where the constructed model is being tested against the industry in question, before finally ending with a discussion of the findings of using the suggested model on the industry.

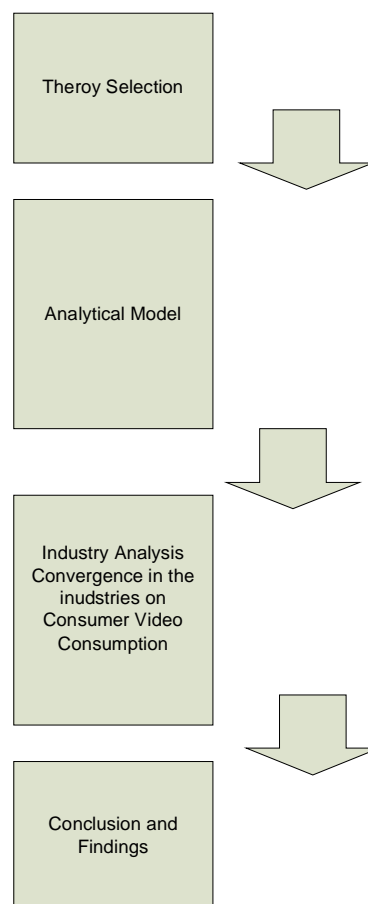


Figure 1 Structure of thesis

Chapter 2

2 Analytical framework

The thesis is based upon theory in the realm of corporate strategy management. Drawing on theory within corporate strategy using dynamic industry analysis (McGahan, 2004), to define Industry boundaries and strategic position in industry evolution. Following the theory on how to sustain competitive advantage for the industry and the firm by creating the first mover advantages (Lieberman) of network externalities industry standards. (Shapiro & Varian 1999)

Managerial model for industry analysis of converging industries

The thesis presents an industry analysis model based upon the path of industry evolution, where industry boundaries are collapsing and where network externalities in form of standards and complementors are key assets for the industry. With the intent that managers in the field of business strategic can apply this model and use it as a framework for conducting corporate strategy in their industry.

For firms to make strategic choices based on the trajectories of their industry evolution, the application of the theory in a model, which can help a firm determine their industry evolution and how they should take up their strategic position in accordance with their industry's evolutionary trajectory.

2.1 Theory introduction

2.1.1 Industry dynamics and industry boundaries

Most dynamic industry¹ analyses apply some kind of life cycle model, which, besides some differences, share the assumption of a linear path in the evolution of industries. According to McGahan (2004) industries initially undergo a turbulent period of “creative destruction” characterized by intensive entry and exit associated with experimental product innovation (fragmentation stage) followed by a period of consolidation reflecting lower entry and intensified

¹ I use the concept of industry in the usual but constricted sense as referring to a group of firms that are direct competitors implying that they offer products with identical or similar functionalities, target the same group of buyers and apply specialized employees and technologies that are not applied in or easily transferred to other industries.

exit and mergers and acquisitions, and the settling around a dominant design, incremental product innovation and scale-intensive operations (shake-out stage) leading into stages of maturity and eventually decline. This single industry/life cycle approach enables us to explain the dynamics in many industries.

However, it is also evident that the evolution of a large number of industries does not correspond to the life cycle model (Klepper, 1997). First, there are many examples of industries which for extended periods remain fragmented with high levels of entry and exit and no unambiguous tendencies towards shake-out and maturing. These have been termed hypercompetitive (D'Aveni, 1994). Secondly, many mature industries have experienced renewed dynamics of entry, experimental innovation and market fragmentation (Breshnahan and Greenstein, 1999; Klepper, 1997; Utterback and Suarez, 1993).

A third explanation of non-cyclical industrial dynamics, is that of changing industry boundaries where the convergence of products and technologies lead to the collapse of industry boundaries between incumbent industries and emerging industries with different rules of development, and the resulting formation of new industries and merging, and eventual demise of existing industries.

These processes of industry convergence have been studied in more descriptive studies where the historical trend of industry convergence has been particularly strong among the industries associated with the diffusion of digital technologies (Yoffie, 1996, 1997). and in (Bradley. Hausman, Nolan, 1993)

Anita McGahan's (2004) offers a typology consisting of four generic trajectories of industry evolution which can help specify the differences between life-cycle-based and convergence-based industry evolution and the significance of changing industry boundaries for the latter. Each of the four trajectories (Progressive change, Creative change, Intermediate change and Radical change) is examined in more detail the next section 2.2.

2.1.2 Strategic position and dynamics in the convergence-based industry evolution

Strategic position for competitive advantage relates to how the industry create value and how its resources and capabilities can be used as key assets and activities. I use McGahan(2004) notion

of core assets and core activities to define the value creation in the incumbent and the emerging industry.

In the thesis, I address how firms in industries that are on the path of convergence-based industry evolution shall align their strategies assets and investments in accordance with the current value creation in the old and in the new industry.

2.1.3 Sustaining competitive advantage in the convergence-based industry evolution

Sustaining competitive advantage theory focuses on how a firms resources and capabilities or must be scarce and imperfectly immobile (Barney) However in order for these resources and capabilities not to be easily duplicated firms should look for mechanisms that act as entry barriers to imitation, these are called isolating mechanisms, (Rumelt, R.) (1987). One specific isolating mechanism is the so-called first mover advantages, which were linked with the RBV view of the firm by (Lieberman and David B. Montgomery, 1998.) Of particular interest to thesis are first mover advantages such as networked externalities and standards, where complementary goods raise the value of the virtual networks. (Katz and Shapiro 1994)

2.1.4 Standards and Network effects as core assets in industries

In today's market it is not one firm, but many firms that together promote standards to an industry. Therefore there is a focus on "compete for the market" and not "in the market", where not only a firm can compete for network externalities but more groups of firms compete for a standard. Under this notion standards and thus first mover advantages can act as isolating mechanisms and be held by an entire industry and act as an effective barrier to the entry of other firms from other industries into the market. Therefore standards can be a core asset for an industry, and be used to sustain competitive advantage for the industry

Assets are held by an industry, particularly assets such as standards that create virtual network between firms and lead to tying in their complementors. This calls for an analysis of industry trajectories in relation to assets and activities and thus can be combined with theory on network and standards, where creating partnerships formed by a group of companies for the express purpose of promoting a standard can lead to create first mover advantages for not just a firm but a whole industry, and how these can be substituted by other virtual networks, which in turn

create a threat to the incumbent industry. Industry substitution, where standards create the basis for an industry's ability to sustain competitive advantages by building standards and luring complementors.

2.2 Industry analysis and Dynamics

In her book *How Industries Evolve* (2004); Anita McGahan develops a broad theoretical foundation on how to determine the current evolution of an industry. The focus of her book on industries is managing change in the trajectories of industry evolution. Michael Porter was renowned for looking at the environment in order to assess competitors' positions (Porter 1985), McGahan follows in his footsteps and argues that firms should understand and adapt to its industry's basic trajectory of evolution before it can make smart investments. She develops her model based on empirical data from comprehensive industry data and defines four broad trajectories of evolution, which industries fall into

2.2.1 Trajectories

A given industry develops along one of four evolutionary trajectories. The significance of determining and assessing on which trajectory the industry is moving along is imperative when a firm within that industry is about to decide which strategies are effective for their business. McGahan (2004) distinguishes between four industry trajectories namely; progressive, creative, intermediating and radical change. Each trajectory relates to the impact on the industry's core activities or core assets.

The most common type of industry evolution is progressive change. Here, neither core assets nor activities are threatened by obsolescence. On this trajectory the way the firms make money and the way they should innovate is by coming up with new insights about how to organize their system of activities effectively. Firms should follow or lead the industry and build on their current capabilities instead of trying to create new ones.

A creative change of an industry trajectory impacts the core assets of the industry. However, the relationship between buyers and suppliers remains unchanged.

An intermediating change of an industry trajectory occurs when core activities of an industry are threatened by the emergence of substitutes. Generally, these changes are difficult to perceive because specific aspects of the value chain are modified without affecting the entire industry.

The impact of radical changes of an industry trajectory tends to affect both core assets and core activities of the industry structure. These changes result from changes such as a new technology in the market or fringe companies that embark on a different model the business model of doing business in the industry. These changes modify the market mechanisms of the industry by reconfiguring existing relationships among actors.

		Core Activities	
		Threatened	Not Threatened
Core Assets	Threatened	Radical Change	Creative Change
	Not Threatened	Intermediating Change	Progressive Change

Figure 2 Type of Industry Change

Source: own creation adapted from McGahan(2004)

2.2.2 Core Assets and activities for the industry

Assets and activities are essential concepts when applying and using the framework of (McGahan, 2004) to assess the trajectory of an industry.

An asset or activity is “*core*” if it is essential to the value created by the industry in the following sense: its destruction today and a year ahead would lead to lowered profit a year from now, even though the firm took efforts to replace the destroyed asset or activity.

In order for a firm to determine the evolution of the industry it operates within, it is necessary to analyse, which assets and activities are core assets for the industry.

Assets

An object is determined to be an asset if it is durable. It can be a manufacturing plant, property, equipment, cash, inventory and account receivable. It can also be a firm's brand and its portfolio of Intellectual property rights, and its patents. A durable object can be defined as an asset, if it retains its character even after lying dormant and not in use. An asset qualifies as a core asset when the profitability of the industry would be substantially affected if the asset were eliminated.

Activities

Actions are defined as activities if the actions are executed within the industry with the purpose of either managing costs or creating revenue for the firm. These include; Purchasing, operations, human resources, distribution, marketing and selling.

2.2.3 Defining which firms are in the same industry

Industry boundaries by identifying common buyers and suppliers

Public Industry Statistics, i.e. those based on ISIC codes, often operate to high levels of aggregation than what would be optimal for analyses used to form business strategies and offer investment alternatives. This has given space to private research consulting firms to provide industry analyses at lower levels of aggregation, which satisfy the needs of firms for analyzing their particular industry. For such a purpose to work, the industry must often be defined more narrowly by segmenting groups of firms that offer the same category of products or technologies and thus target the category of markets.

The framework from (McGahan 2004) follows the principle of segmenting firms into smaller categories than the ISIC Codes. Besides focusing at the end product, a way to segment firms into one defined industry is to evaluate their common buyers and suppliers. If a group of companies shares both the same buyers and suppliers, then they qualify as members of the same industry.

2.2.4 Architectural change

(McGahan, 2004) defines architectural change as the threat to core activities in the industry.

Each core activity is linked directly to both revenue and costs of the industry. Threats to core activities can be measured by looking how value is created within the industry. Value creation is the measurement of the change in the “willingness of all buyers to pay” is falling, which puts a cap on prices. The same logic is applied to the change in totals of the “willingness of all suppliers to sell” is falling, which puts a cap on costs. The reason for using this metric is that the alternative is looking at historical data over time, is that the motives and actions for architectural

change is often very complicated to rule out and identify. According to Michael Porter's classic value chain model (Porter , 1985), the goal of each activity in a value chain is to add more value for the customer than the cost of carrying out the activity. The ability to add value depends ultimately on a cost advantage, on differentiation, or on the ability to reconfigure the value chain. Indicators of architectural change in the industry can be of help in identifying if change is under way. One way is to look for changes in specialized groups of buyers and suppliers within the industry and see if they are migrating or pursuing other opportunities.

Architectural change, impacts Life cycle model analysis

Emergence	<i>Volumes are lower but growth rates are higher than the established industry, but the difference in volume is so high that convergence does not occur</i>
Convergence	<i>Growth in the new industry compared to growth in the old industry is high enough to cause convergence in volumes between the two industries.</i>
Co-existence	<i>Grow rate in the new industry is slowing but higher than old industry. Each account for a significant share of volume yet growth is slower than in the convergence phase.</i>
Dominance	<i>When the volume of the new industry is higher than in the established industry.</i>

Table 1 source: Authors creation Adapted from McGahan 2004

When change is architectural, the normal “Life cycle model” is not relevant and withers away, and the new model is used. Intermediating happens faster than radical change, usually in a decade instead of several decades. Transformation occurs in the established industry, the new approach is moving along the progressive trajectory.

2.2.5 Foundational change

Core assets become threatened by obsolescence when a new way of doing things increases their rate of depreciation. The value creation of the industry is affected and thus the profitability and sustainability of competitiveness of the industry is at stake. The threat of the obsolescence may come from within the industry or it may stem from outside the industry. Usually foundational change arises in the conventional set of buyers and suppliers in the industry. But it can also

originate from outside the industry's boundaries, when outsiders with common competitive intent try to enter the industry with i.e. a new technology.

Core assets are threatened if each of these totals drops because of a threat to core assets. But one important note is that this does not apply if one of the firms within the industry captures business from the other. The threat must affect the industry as an entity.

Trajectories of evolution by architectural and/or foundational change in assets and activities

Recall from the definitions of Progressive, creative, intermediating and radical change that if an industry's is transforming both architectural and foundational, it is on a path of radical change. If however only architectural transformation is under way, it is on an intermediating path. Whereas if the path of transformation is rooted in foundational change, it is on a creative path. If neither Architectural nor foundational transformation is under way, the industry is on a progressive path of change.

2.2.6 Phases in the Industry Trajectories of ILC industries

2.2.7 Life cycle measurement for progressive and creative change

There are four stages in the industry life cycle, the fragmentation, shakeout, maturity and decline phase. Firstly one has to measure the rate of growth for the industry. This can only be done after having identified the industry. The growth rate of the industry indirectly indicates where the industry is heading. If the growth rate rises each quarter over quarter in a years time the industry is between the fragmentation and shakeout phase. The year, where the rate of growth drops in four following quarters, the industry have reached the stage of maturity. When the total volume drops in an absolute sense the industry have reached the point of decline and is thus in the phase of decline

2.2.8 Life cycle measurement for intermediating and radical change

In opposition to Progressive and creative change measuring aggregate industry growth rate for the industry itself is not enough to determine whether radical or intermediating change is taking place, here the firm need to compare the growth rates of its industry with the growth rates of the emerging industry to which it might be affected by a transformation of its activities in the future. There are likewise four stages in radical and intermediating evolution. When observing a new

industry, where the growth rates are higher than in the established industry the industry is said to be in the emergence phase. When the new approach shows decreases in the absolute difference in volumes across the old and new approaches the industry is in the stage of convergence. When the growth in the new industry begins to slow but remains higher than in the established industry the stage of evolution is said to be in the co-existence phase. Lastly, when the new approach gains larger volumes than the established industry the industry is said to be in the dominance phase.

2.2.9 Assessing the stage of industry evolution for progressive & creative change

The data needed for measuring this stage is the changes in industry volume by the whole industry. The life cycle of an industry following a progressive or creative trajectory is divided into four stages. In the classical life cycle model, industries start out with a period of fragmentation, where companies experiment with different approaches to a market. The companies offer a variety of products and operate at low volumes. In the next phase the shakeout stage, industry volume increases dramatically. In the shakeout stage, the maturity stage where volume growth slows down and the declining stage is where volume is falling.

2.2.10 Trajectories of converging industries,

McGahan (2004) emphasizes the competitive dynamics whereby core assets or activities in an emerging industry eventually come to substitute those of an incumbent industry.

When both the assets and the activities are threatened she terms the industry progression to be on a “radical” course of change for the incumbent and the emerging industry is on a progressive course of change. Within these trajectories there is also certain stage of maturity of change. The first stage in the model will be to determine whether the two industries are on a course of change whereby one of them will come to substitute the other. The model will be used to evaluate the trajectories and the stage of change by looking at the core assets and activities for both industries.

2.3 Network Economics

2.3.1 Need for creating Partnerships Standards & complements in network markets

In order for the firm to sustain competitive advantage in the long run it needs to create isolating mechanics in form of first mover advantages which is important throughout the industry evolution, where the two industries are converging. When industries, including emerging industries, create changes in competitive and or complementary relations between two or more industries it is time to act. (McGahan 2004). The two beforehand distinct industries that are now on a phase of an architectural change, will at the stages in their industry life cycle face the needs for looking into alliances as a way to deter the coming changes and in the boundaries between the two approaches.

This thesis focuses on the first mover advantages of creating network externalities with complementors and creates the related standards. McGahan's theories of Industry dynamics by focuses heavily on the firm internally can create competitive advantages, but for network externalities, standards and virtual network to work the firm must rely on outsiders for it to create first mover advantages. Usually, one firm cannot hope to offer all the pieces that make up virtual network. Traditional rules of competitive strategy focus on competitors, suppliers, and customers. In the industries that shows network externalities, companies selling complementary products or complementors, are equally important. Therefore theory on these subjects is relevant to include in this thesis to answer the research question.

Communication, Information and media industries share, that they are influenced by economies that are specific to networks. In the context of this industry analysis two distinct types of networks are of interest. One network type connects its members psychically, as in the case of communication networks. The other connects its members via a virtual relationship as in the case of the users networks or a specific software system. These networks have in common that the single network members increase with a growing number of new members, which in sum increases the value of the total network. Moreover the value of the network and its subscribers increases with the number of suppliers of complementary services. The fundamental behind these "network economics" also known as network effects; demand side economics of scale or positive feedback economies shall give the economic rationale for adding complements to product.

2.3.2 Direct network externalities

Positive direct externalities network also termed network effects arise in the context of physical networks and defines the value that network members experience, who are connected to a communication network. Those positive network externalities arise when one market participant invests to become a member of the communication network. The membership increases the value of the total network without the other network participants are compensating the new member for their increased network utility.

Metcalfe's law of network summarises the positive network externalities in a rule of thumb (Sharpiro & Varian 1999) The total value of the network is increasing exponentially with the number of participants after having surpassed a certain critical mass. According to Metcalfe's line of reasoning, a critical mass of committed users to a Digital video format can exert a powerful pull effect on the markets attracting even more market participants to use the video format, which is further enhancing the networks value. Demand side economics of scale is another term to describe this tipping of a market towards the largest network, as it offers a higher utility (positive network externalities) to the new user as compared to smaller losing networks.

The winner takes all contest can often be traced to technical standards and the network effects they trigger. Building critical mass in one's industry to establish a de facto standard and making one's own collation attractive to customers through accessing and tying "complementors" (providers of complementary goods and services that enhance the value of one offerings to costumers) from related adjacent industries are the two fundamental drivers of alliance in that situation.

2.3.3 Indirect network externalities

In distinction to the direct network externalities described above, the indirect network externalities can arise without the existence of a direct physical connection, such as the connection of a telephone wire. An example for indirect network effects is the network of all car drivers. The more cars sold in market place, the more road systems and gas stations will be provided to satisfy the complementary needs of the car drivers. There exists a virtual relationship between the network of car drivers and complementary services and the effects of that virtual connection are called indirect network effects. Typical for the virtual relationship is that the

complementary services increases in their number and decrease in price, the more of the core product i.e. cars, are sold in the market place. The relationship is also known as the hardware software paradigm² (Katz & Shapiro, 1994). According to the mechanism of the paradigm, Indirect network effects seem to a great extent mediated through the markets. However often remain some positive spill-overs external to market transitions that have an amplifying effect on supply and demand. Returning to the paradigm scenario above, which stated that, when more users start using one particular digital video format, the more high quality complementary products will become available and offered. The higher quality of these complementors products supporting the digital video format, the higher the attractiveness of this format will become.

The implication of such a signal may lead to self-enforcing virtual demand supply cycle. Once a certain critical mass of consumers have committed to the new digital video formats, this may pull firms from neighbouring industrial sectors to enter the Digital video format value chain and to provide a diversity of affordable and interesting complements. The enhanced provision of the complements on the other hand may pull even more consumers to adapt to the digital video format with the game cycle continuing until the market finds equilibrium.

2.3.4 Standards

In emerging industries that carries the traits of being a network market, the competition for becoming the standard will be very important, since there might in the end only be one player left, if the market shows strong positive feedback.

Where high network externalities exist, the establishment of common standards generally brings several specific benefits to the members of winning standards alliance. These can include strong first mover advantages such as the ability to define what will and will not become a basis for product differentiation; and the ability to collectively define technological trajectories, making the path of innovation more predictable and more favourable to alliance partners.

Also Firms that collectively own the standard will be able to set prices and demand royalties and licenses on patents and intellectual property rights from the standards.

² The paradigm naturally stems from the IT industry when increased computer hardware offerings had an effect on complementary software offerings in terms of lower prices and increase in quantity

2.3.5 Becoming the standard

In competing to become the standard, or at least to achieve critical mass, consumer expectations are critical. In a very real sense, the product that is expected to become the standard will become the standard. Self-fulfilling expectations are one manifestation of positive-feedback economics and bandwagon effects. As a result, companies participating in markets with strong network effects seek to convince customers that their products will ultimately become the standard, while rival, incompatible products will soon be orphaned. (Shapiro & Varian, 1999)

Because of the importance of critical mass, because customer expectations are so important in the area of information infrastructure, and because technology is evolving so rapidly, the timing of strategic moves is even more important in the information industry than in others. Moving too early means making compromises in technology and going out on a limb without sufficient allies. Yet moving too late can mean missing the market entirely, especially if customers become locked into rival technologies. (Shapiro & Varian, 1999)

2.3.6 Open versus closed standards

Standards alliances span the distance between full openness and control. At the one end of the spectrum is an alliance that makes the technology freely available to all participants, but not necessarily to outsiders. At the other end of the spectrum is an alliance built around a sponsor, a central actor that collects royalties from others, preserves proprietary rights over a key component of the network and or maintains control over the evolution of the technology. If the sponsor charges significantly royalties or retains exclusive rights to control the evolution of the technology, we would classify that situation as one of control, not openness. [and the standard is not disclosed openly]

2.3.7 Partnerships with Complementors

Which kinds of partnerships³ are likely to lead to superior performance?

Firm's policies for accepting rejecting and pursuing alliance proposals should be a part of a broader plan for dealing with the industry change and with the implications for its competitive

³ Alliances or partnerships are defined in this thesis as; An alliance formed by a group of companies for the express purpose of promoting a specific technology or standard. Not the more broadly definition of an alliance.

position. While there is no general rule for how alliances can be used to improve performance, there are many situations in which alliances can be powerful mechanisms for effecting a transition through the course of change (McGahan 2004)

The reason for focusing is on creating the necessary partnerships, standards and complements. Assets from completers are situated outside the boundary of the industry itself, when looking at assets that are complementary to the product itself and or the virtual network. Therefore partnerships are needed not just between industry participants but also between intra industry partners. Partnerships with Complementors and others typically involve extensive wheeling and dealing, as multiple players negotiate based on the three key assets: control of the existing installed base, technical superiority, intellectual property rights. (Shapiro & Varian 1999) The focus in this thesis is where complementors are needed to create de-facto standards in markets, and to lure complementors from adjacent related industries so that their products support your product offerings.

Chapter 3

3 Application of theory in a managerial model for Industries that are converging



Figure 3 Managerial model
Source: own creation

3.1.1 A Managerial model approach to theory on Industry evolution in converging industries

Having covered a broad base within the theories on industry evolution, network effects and standards, this part of the thesis create a managerial model based upon the theories. The model is thought as an analytical model that can help business practitioners determine where their firms industry is in its trajectory and phase in its life cycle of industry evolution. Furthermore does the model help to answer the research question on how a firm can sustain competitive advantage in

industries that are converging. Secondly, does the model help business practitioners align their current and future investments with their core assets and activities for their firms in the industry. Thirdly, does the model help them analyze if their industry and products are in a market that exercises network externalities with complementors. The model can help to create an understanding on how to create, standards partnership and lure complementors.

3.1.2 Why is this model needed?

A firm facing collapsing industry boundaries within its industry, needs a model that help the firm to understand its industry evolution in order to form consistent strategies. Such a model is presented here. The dynamic action decision model covers three main tasks the firm should perform namely, evaluating its industry evolution to determine the threat to its assets and activities. Secondly, the firm should align its strategies with the evolution and thirdly it should be searching for partnerships with other firms that can complement its products offerings and bring needed assets and activities. Lastly should the firm create competitive standards and complements needed in network markets.

3.2 Determine if industries are converging



Figure 4 Trajectories of Converging Industries

The first part of the industry analysis in this model is to choose two industries that the firm assumes is converging⁴ together. Usually, it will include the industry in which the firm itself is situated and a corresponding industry that the firm is assuming might be starting to compete with the firm and its current competitors.

⁴ The term here covers, the definition, that two or more industries are fulfilling the same customer need, but they are based on different assets and activities and do not share the same industry boundaries.

In the beginning it is easy to distinct one industry from the other. However they often do move toward each other and the industries will start to merge. The model looks at industries where there is some form of substitution and thus collapsing boundaries between two or more industries.

The firm can in the following part of the model evaluate if their industry is converging by describing the changes happening and describing the new industry by using industry dynamics. The firm should firstly determine the boundaries of the industries involved in the convergence; then determine their evolution and the stage of evolution by seeing how their assets and activities are threatened. Secondly the firm can determine if the industry and the new industry are industries that are also based on network externalities and positive feedback. After that has been done the firm can start to align and create its firm to the new market situation.

3.3 Evaluate; Your Industry Trajectory

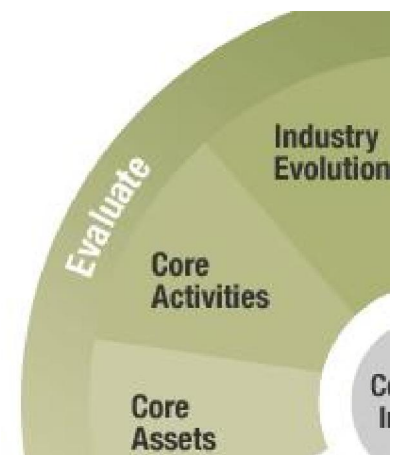


Figure 1 Evaluating Industry Trajectories

Evaluate

The first step a firm should do before deciding on its strategic options for the future is to evaluate on which trajectory of evolution the firm and the industry is moving along. The importance of understanding the evolution of the firms industry is paramount, since the assets and activities that create values for the industry might become under threat from new entrants or new ways of conducting business. If the firm does not first analyse and determine which of its industries assets and activities are core to its industry, many subsequent strategic decisions might be wrong. Therefore the firm must conduct an analysis, where it determines the core assets and core

activities that make up the industry, in which it is operating. When that is done, the firm will be able to evaluate whether some of these assets and activities are threatened. Having evaluated this, the firm will be able to understand on which trajectory of evolution its industry is moving. This phase of the model helps the firm to create a dynamic overview that shows a larger picture of not only the company and its competitors in the industry but also the underlying trajectories that govern the industry. Furthermore does this phase look at what adhering industries might affect the current industry in such a way that the current industry business models become obsolete.

3.3.1 Define the boundaries of the industry

To define the boundaries of the industry, companies using this model should focus creating an overview of their competitive environment. The analysis should include their current buyers of their products through the whole value chain, to see who they share common buyers with. It is not to only look at the firm's resellers and distributors, the firms must also understand the different end consumers, both the mainstream buyers and the more specialized buyers such as the early adopters of new product offerings. Secondly should the firm define their suppliers to their products. Then the firm must see, which suppliers they are sharing with their competitors and also investigate if the common suppliers are offering their products to new competitors outside the industry.

3.3.2 Who are the company's competitors

A simple way to determine who is competing against each other and thus who is in the same industry is to see if the firms share the same buyers and suppliers. Since many firms often buy from many suppliers and sell to many buyers this can be a rather large exercise. However the important distinction here is that not only must the firms share the common buyers and suppliers, they also must be connected in such a way, that if one firm makes changes in prices to buyers and suppliers, they will shift their business to the other firm. If the industries do not share any common buyers and suppliers they can still be said to be competitors. If the industries for example share technical platforms or that share companies that have a common competitive intent to enter the business these can also be competitors. Thus the boundary of the industry shall be determined by accessing these metrics

Common buyers and suppliers

To determine the shared buyers and suppliers of an industry the firm can look for changes in willingness to sell and buy from buyers and suppliers in the industry between the firm and its competitor's products offerings.

If a significant drop in prices demanded by one competitor leads buyers to shift to that competitor and thus sales of the companies are affected, then it can be said that the two companies share the same buyers, and thus are competitors in the same business. The same test should also be conducted on the suppliers. If a significant increase in for example compensation paid to employees would cause them to seek job opportunities at the presumed competitor then it can be said that the two companies share suppliers.

An additional criteria from measuring which companies one competes against, is that generally should 25% of all buyers and suppliers should express virtually no preference between the alternatives available to them from firms in the same group. This measurement can help identify whether firms are correlated in the same industry.

Shared technical platforms

Analyse the technical platform of the industry to see if other industries do share the same platform or are on a different platform, If they do share the same technical platform, they can be said to be competitors and part of the same industry.

3.3.3 Determine the industry's activities

The activities of an industry are defined as the actions executed within the industry with the purpose of either managing costs or creating revenue for the firm. These include Purchasing, Sales, Distribution Marketing and Selling.

A way to identify these activities for the company to define its core activities, it that it should list down the activities that they utilize, by creating an exiting value chain of activities for the firm and then in order for the actions to be defined as core, more firms in the industry must utilize the same actions

When the firm has conducted such an analysis of its actives, it should subsequently try to identify which of these actives that can be qualified as core actives for the firm and the industry

as a whole. In order to identify which activities those are core for the industry. The activities that can be deemed to be core for the industry are those that if they were destroyed or removed today, they would affect the profitability and revenue of the industry today substantially.

New occurring threats to the industry's core activities is usually is sometimes only just emerging. It can be difficult to spot the evolution of the threats early on. The firm should therefore monitor their specialised buyers and suppliers to see if they are shifting away from the normal way of arranging sales and purchasing between the buyers and suppliers. Secondly must the firm determine whether the activities are done in wholly different way and whether new sales channels or purchasing channels are opening and affecting sales on a longer term.

Willingness to pay and sell parameter (Price elasticity)

To identify which activities that are threatened firms can perform an estimation of which of the activities that can be affected by the willingness of buyers to pay the demanded prices for the firm's products and the willingness to sell a requested prices from the firms suppliers. Also known as testing the price elasticity of the products of the industry.

If buyers are not willing to pay the demanded prices, then the WTP are falling and activities might be under threat of obsolescence. If suppliers are not willing to sell to the asked for prices then the willingness to sell and costs maybe becoming higher or suppliers are starting to sell to others. Importantly for the threat to the core activities to be valid, both buyers and suppliers must be affected, and then the firm can be sure that activities are threatened.

Questions the firm in the analysed industry should answer include;

Does the industry experience falling revenue and growth?

Does the industry experience commoditisation and falling prices of its products in the industry?

Do the suppliers and buyers suddenly demand more of the firm?

Is there a lack of interest in the current products from the buyers, suppliers and end costumers?

To determine these parameters, one method is to look for changes in buyer and supplier patterns in specialized groups of buyers and suppliers to see if they are pursuing other options within the industry. Thus the firm can then determine which of these actives are threatened by, testing if both buyers and suppliers are becoming less willing to buy and or sell at demanded prices.

3.3.4 Determine the industry's core assets

Where activities relate to the firms purchase and selling operations, the firms assets concerns the firms and the industry's tangible assets. A durable object can be defined as an asset, if it retains its character even after lying dormant. It can be a manufacturing plant, property, equipment, cash, inventory and account receivable. It can also be a firms brand and its portfolio of intellectual property rights, and its patents.

Core assets become threatened by obsolescence, when a new way of doing things increases their rate of depreciation. This can be measured as the return on invested capital in that the asset decreases. The threat to core assets can come from both outside and inside the industry, however if the threat to the industry's core assets come from inside the business, it usually comes from its traditional buyers and suppliers, and not specialized suppliers as in the case of accessing core activities. If however the threat to the core assets comes from outside the industry, the rate of decrease of the assets often happens much faster than change inside the industry. .

The firm can access which of its assets are core by performing the same WTP/WTs measurements as it did the analysis of its core activities.

3.3.5 What fundamental changes are occurring in the industry?

To understand what changes are underway in the industry the company must first determine what assets and activities that are core to the company and the industry as a whole. The core assets and activities are those that affect buyers and suppliers to the industry at the same time.

Industries evolve as a result of two types of threats of obsolescence,

- 1) A threat to the industry's core activities
- 2) A threat to the industry's core assets

The threats to the core activities is defined as recurring activities companies perform to attract and retain suppliers and buyers that have historically generated profits for the industry.

The threats to the core assets are the durable resources, including intangibles such as knowledge and brand capital, Patents, and Intellectual property rights that have historically made the organization efficient at performing core activities, are starting to fail to generate value.

3.3.6 What trajectory is the industry on?

Having determined if there is a threat to the firm's core assets or activities, the firm can now determine what kind of industry evolution is taking place in its industry.

As illustrated in the figure below, the industry is moving along a Progressive trajectory when neither core assets nor core activities are jeopardized.

The industry is moving along a creative trajectory when core assets are under threat but core activities are stable.

The industry is moving along an intermediating trajectory when core activities are threatened, while core assets retain their capacity to create value, and lastly is the industry moving along a radical trajectory, when core assets and core activities are both threatened with obsolescence.

		Core Activities	
		Threatened	Not Threatened
Core Assets	Threatened	Radical Change	Creative Change
	Not Threatened	Intermediating Change	Progressive Change

Figure 5 Type of Industry Change by analyzing the core assets and activities of an industry
Source: own creation adapted from McGahan(2004)

3.3.7 Determine where the converging Industries are in the stages of their life cycle in relation to each other.

Industries also emerge, mature and decline. It is vital for a company to assess on what stage in the industry evolution, that its industry is positioned. The reason is that, the stage of evolution in the industry is correlated to the ability of the industry to alter course in strategy to combat threats and changes to the industry. For a more detailed insight in what strategies to pursue at different stages in the industry life cycle see the Align phase part of this model.

To determine what stage of evolution the industry is in the measurement to apply is the growth rates of the industry and the total volume of the industry relative to the total volume in the converging industry. Additionally can the firm measure the interest and product capabilities satisfy normal and special buyers.

Growth Rates of Industry revenue and volume in converging industries.

The life cycle of an industry following an Intermediating or radical trajectory where competitors form another industry is threatening the assets and activities of the incumbent industry. Here growth rates and the differences in total volume of the incumbent industry is compared to the emerging industry

For converging industries the following model can be used to assess where the incumbent and the emerging industry is in its life cycle. The model below is divided into four stages, emergence, convergence, coexistence and dominance.

Emergence	<i>Volumes are lower but growth rates are higher than the established industry, but the difference in volume is so high that convergence does not occur</i>
Convergence	<i>Growth in the new industry compared to growth in the old industry is high enough to cause convergence in volumes between the two industries.</i>
Co-existence	<i>Growth rate in the new industry is slowing but higher than old industry. Each account for a significant share of volume yet growth is slower than in the convergence phase.</i>
Dominance	<i>When the volume of the new industry is higher than in the established industry.</i>

Table 2 Volume and Growth rates between two industries

Source: Authors creation, adapted from McGahan(2004)

Differences in normal and specialized buyer's adoption of new and old products

In supplement to the analysis of growth rates and volume a test of normal and specialized buyers can also be performed. The idea is that early adopters of new products will often be the first to try out new approaches and products to solve the same or new type of demand. Some early adopters will often value the products capabilities of the new approach higher than mainstream buyers. After some time more and more mainstream buyers will appreciate and discover the new product capabilities, like the early adopters and follow suit.

Emergence	Some buyers opt for the new industry's products
Convergence	Performance by new approach improves dramatically
Co-existence	Mainstream buyers rate the overall value of the new products to be the same as the old product. New products perform in some way better on one or more attributes
Dominance	When new products are judged better in all aspects of performance than the old by mainstream buyers.

Table 3 Measuring Buyers Valuation of product attributes

Source: Authors creation, adapted from McGahan(2004)

3.3.8 Determine if the converging industry is showing network externalities

An equally important tool for understanding the industry, besides industry trajectory analysis, is the analysis of network externalities. The firm should assess if its current industry and the emerging industry shows trait of positive feedback. If the firm's current industry is a network market, and the new industry could be a threat to this market, the firm need to understand whether its network market assets are under threat form the emerging industry. See more in creating key asset in network markets in the create phase in the model. Secondly should the firm also asses if the current standards that governing the incumbent industry are under threat, and also see if its current core assets are related to network markets.

If the emerging industry that is converging with the incumbent is showing traits of having network externalities, it is not enough to analyse the buyers, supplies and the specialized buyers in your current industry. It is almost as vital to determine whether the markets show signs of positive feedback mechanisms and network effects.

Firms should ask the following questions to assess the threat:

- Determine if the firm's industry or the new industry shows network externalities
- Does the firm see cross industry merger?
- Does the firm see alliances being made?
- Does the firm see standards being created?
- Does the firm see usage models shifting?

Complementors to the industry in network markets

Another important issue in network market is the complementary products, that add additional value to the firm's product offerings. Since complementors add such a large position in network markets, change in complementor's trajectories can also create change in the trajectories of the firm in the analysis.

3.4 Aligning Investments with Industry Evolution and convergence



Figure 2 Aligning to Industry Change

Having analysed and concluded on type of industry trajectory and stage of life cycle the industry is in, the firm will then have a better understanding on how to align its internal strategic options with the changes happening in its industry. The task for the firm in the alignment phase of the model is to take action in accordance with the industry evolution. If the evaluation shows that the core assets and core activities of its industry were in some way threatened, then it will need to

see how it can replace or change these assets and activities so as it can stay competitive in the future. When the firm have decided upon the needed assets and activities, it must decide how to align its investments with both the industry evolution, and the thereby needed assets and activities.

The firm must choose between 3 basic investment alternatives and deem which of these that are suitable or best fit in order to get hold of the required assets and activities. These 3 alternatives can basically be condensed down to; creating assets and activities internally, externally acquiring them, or partnering with other firms that hold some of these assets and activities. The choice will often include using more than one of the alternatives. For some investments acquiring might be the most suitable choice in order to get hold on assets and activities. In other circumstances it will be creating them internally or maybe seeing that partnerships would be a more suitable option for the firm to render these assets and actives usable. The key point here is that, the needed assets and actives are aligned with the path of the industry evolution.

3.4.1 Aligning strategy, Assets, and Investments in accordance with industry evolution

Having identified the evolutionary path and stage of evolution in the industry the firm must decide how these changes will affect its corporate and business units strategic planning and execution in the future. There are several options and actions that the firm can combine when decide on how to deal with the change. The trajectories of industry change are typically unfolding over decades. Fighting the industry change is almost always too costly to be worthwhile therefore firms should reconfigure themselves for lower revenue growth and develop the ability to move activities and resources out of the business. Depending on the trajectory of evolution and stage, firms have different options for response.

Progressive	Creative	Intermediating	Radical
Create a connected system or standard	Search for new assets	Search for new ways of buying and selling	Exit, scale down or search for new assets and new ways of selling and buying

Table 4 Generic alignments of strategy in accordance with industry trajectories.

Source: Authors creation

3.4.2 Progressive Change

If the industry analysis revealed that the firm is operating in an industry, where it is evolving alone the progressive trajectory the following should be considered in aligning the firm's strategy. The firm should develop a system of interrelated activities that are defensible. The interrelated activities are not hard to understand or replicate, but their compounding effects over time can be difficult to cope with because of the cost of building up similar activities. The firm can rest assured that there are not imminent threat to its core assets and its core activities. However if the analysis showed that the firm is not among the leaders in this industry of progressive change, changes are the profits are hurting and the firm might find it difficult staying in the industry if the other larger competitors are more integrated and dominating it. The firm should look for how it can become the leader in the market, or see how it can create a unique system of activities that matches the other players. Secondly the firm could look for a related or emerging industry where it can build up a new activities and assets.

3.4.3 Creative Change

Having reached the conclusion in phase 1 that the firm is moving along a creative trajectory of industry revolution its core assets are threatened by obsolescence. As a first step, the firm should start by assessing how quickly its core assets are decreasing and determine the segments in which they can protect its competitive position from those in which it's position will erode quickly. Secondly the firm should access the threat, where it stems from and possibly discover a way how to generate new core assets and see how it can acquire assets by offering something valuable in return.

3.4.4 Intermediating Change

If the firm in that analysis discovered that some or their core activities of conducting business is being threatened by an approach such as new buyers and seller relationships, the challenge for the firm is how to invest in the future in its existing business model. The less risky option is to pursue profits in the near term, while avoiding investments that could later prevent it from ramping down its commitments. Secondly the firm must come to understand how the new competing methods are changing its business model and seek advice in learning from new competitors and understand the new embedded and tacit methods that the challenge withholds.

Lastly the firm must find new ways of selling and buying its products, while considering ramping down its existing structure.

3.4.5 Radical Change

In phase one the, firm should have assessed what threats there might be to its core assets and activates, If the analysis shows that both these are in some way threatened by obsolescence, the firm should first try to estimate timely how present these threats are to its exiting ways of conducting business. The result is a combination of the suggested actions to utilize in the creative and intermediating phases. At one hand scale down commitments in the distant future, focus on profits in the near futures, asses the devaluation of its assets and see which of them that can be protected. In the this radical trajectory of evolution the managers of the firm should develop a strategy for either exiting the business in the long term and or decide where its current assets and activities could be deployed in another industry or try to leapfrog the evolution of the industry by diversifying away from it in

3.4.6 Aligning investments to the stages of Industry evolution

Regardless of which trajectory the industry is on, it still retains is character as either being in the early, middle or late or ending stages of evolution. There are therefore different tactics depending on the stage of evolution of the industry that the firm should consider before acting on the trajectory itself.

Emerging stage of industry evolution

When the industry is just starting to from, and start-ups are trying to find the the right way of arranging activities and utilizing their assets, firms should try and experiment with what model that fit the industry best. If the firm is an incumbent in a related business, or a business that see a threat in the new industry it should try to experiment by setting up small independent divisions that try to learn form the new industry. Importantly the incumbent should search for a model of arrange assets and activities that create a higher ROI than the industry average, by this measure the firm can validate whether their trails are successful in relation to other competitors. For some firms that are considering the business but cannot find a viable way of delving a solid business model and a product, the firm should instead at the beginning focus on the learning experience of

participating in the new industry, and save those experiences for later use, when and if the industry takes hold. In the early phase of the industry evolution is also of key importance to try and secure assets for later use so that other firms do not get exclusivity on those. In industries where standard and network effects are of importance incumbents should try not to let small start-up reap the benefits of first mover advantages, but aggressively compete with them in the beginning.

Converging stage of industry evolution

When the industry have taken hold, firms should try to choose become the standard in the industry by focusing on distinctive features of their products offering while at the time starting to understand how they can optimize their production and make costs a issue.

Co-existing stage of industry evolution

In the late stage of industry evolution where the industry as a whole sees that revenue is starting to drop, firms should focus exclusively on managing costs over growth targets. An alternative to the current industry could be considered by moving into new high growth areas to sustain or gain new revenue. However the problem of the old industry's revenue drops is still present. Important for firms facing the late phase of industry evolution is to focus on not over investing but managing their current resources in the industry smartly. Partnerships are especially attractive as the company manages transitions trough the convergence, or coexistence phases of evolution in its industries.

Dominating stage of industry evolution

When the industry is in decline, firms in the industry should focus on developing the flexibility to be able to exit the business and scale down their commitments in the industry. Firms should look for ways to diversify into related business where their assets and activities can be sustained if applicable. Another option is to leapfrog into a new business.

3.5 Create; partnerships, standards and lure complementors

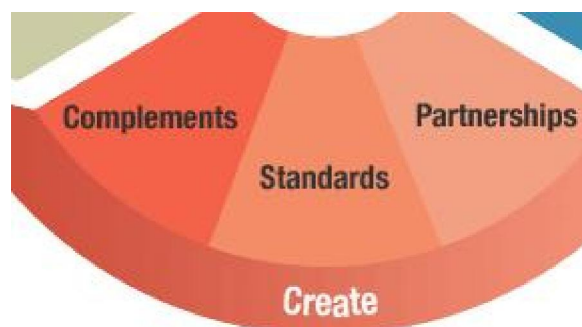


Figure 3 Fostering Network Effects by creating P. S. C.

Create

The third phase of the model is where the firm determines what partnerships are needed in order to create competitive standards and complements that will help the firm and its partners in winning the standard battle or network market. Here the firm will have a range of partnerships available and it will also look into what partnerships suits which goals. The importance of partnerships might be that other investments are not possible or downright illogical, if the competitive situation leaves little other options unavailable.

The third phase of the model relates to the fact that in some industries and arguably here in converging industries, the alternative of partnering in the form of allying with a firm or other firms, can present a better suited alternative of composing the assets and activities together than the other two alternatives can present. An more elaborate understanding of this is, that firms in converging industries often need the complementary products of other players in the new industry in order to succeed and convince buyers that their products is the best option.

Furthermore in convergence markets, standards are often needed to be created and they are often not created by only one firm. Direct and indirect competitors do often not accept one firm owning the standard. So they will create competing standards. Phase there therefore is about how the firm can create partnerships in which it negotiates the needed assets and activities with other firms in order for them to create a new standard and also share the pie of profit and market. This will lead to that, the firms will have to determine what type of standards and what type of complementary products that will be needed in order for the standard to succeed. An additional argument for partnering instead of acquiring or creating internally the needed assets and activities, is that some assets are unique, and the firm will not be able to get access to those

unless it is willing to share some of its assets and activities with the partnering firm, in order to get hold of them.

So in some industries like the content industry, an assets sharing alliance is the way forward, for an hardware producer, the standard setting alliance is often the best option.

3.5.1 Creating Partnerships

Firm should determine what potential partners that can help them succeed in the converging industry. They should look for partners, which have the assets the firms need's. They should see what type of partnerships that is best suited to get and create assets.

3.5.2 Creating Standards

If the firms assets are being substituted or being reserve-engineered around their current standard their assets loses its value and thus the assets is threatened. Generic ways to counter such threats is presented below;

- Join standard setting associations where the firm can have a large say in the process formation.
- Ensure that products can talk together, software, hardware and compatibility.
- Lure the firm current partners into the same standards setting agency.
- Offer access to the firm's assets and activities in exchange for theirs.

3.5.3 Creating Complements

How can the firm lure Complementors into their alliance network?

Look at the complementors today where are they headed, can the firm force new partnerships and create other network effects that can help the firm in the new situation?

If the alliance's value creation consists of building up a standard and gaining critical mass, there are some key assets that a alliance builder should look for in an ally or have itself. These assets have that in common that they place the firm in a potentially unique position to contribute to the adoption of a new technology.

3.6 Conclusion on the managerial model

This model have shown how industries that are facing convergence in their market can apply the model and help them determine their current industry evolution and determine the phase they are in the evolution of the industry trajectory. Furthermore does the model pose relevant questions and exercises the firm can make in order for it to align its assets, activities, investments and strategy in order for it to align these investments with the measured industry trajectory that are underlying for their particular industry. Lastly does the model pose relevant considerations on how the firm should create partnerships standards and lure to access and partner with firms to build needed new assets and activities. The industry analysis part of the thesis will try to analyse a given industry in order of trying out the applicability of the model in a current industry.

Chapter 4

4 Industry analysis using the constructed managerial model

4.1.1 Purpose of the analysis

The purpose of this part of the thesis is to try out the constructed managerial model in a real world setting. In order to understand how applicable the model is, this chapter will conduct an industry analysis of the physical and digital media players converging industries using the managerial model. The industry evolution happening now in the market for digital media players is happening very rapid at the moment and it would be interesting to see if the model can help insiders in the industry as a tool for laying out a qualitative analysis of the change happening now. Secondly will an application of the model on the given industry reveal whether the model is justifiable as a tool for managers to use as a strategic tool for understanding change and understating industry trajectories within their industries? Thirdly will the analysis answer the third empirical research question.

4.2 Choice of industries for analysis

The analysis covers the Consumer Electronic industry with specific focus on the producers of digital movie watching equipment for the home. The analysis includes the traditional manufacturers of consumer electronics such as the large Asian corporations of Sony and Samsung who manufactures physical disc players which are often known as DVD players and Blu-ray players.⁵ Secondly does the analysis covers companies who up until now were exclusively producing consumer computer hardware equipment. These include companies such as the computer manufacturers such as Asus, The networking equipment producers like Linksys and Netgear, and the computer storage producers such as Western Digital and Seagate.⁶ The market also includes newcomers of smaller independent hardware producers. These companies are entering the Consumer electronics market by producing computer consumer electronics that replicate and enhance the functions and usage models of the traditional consumer electronics.

⁵ For a complete list of affected Consumer electronics companies covered see Appendices

⁶ For a complete list of entering IT hardware companies covered see Appendices

Specifically the emerging market of non-physical disc based digital media players are the focus of this industry analysis.

4.2.1 Geographic limitation and focus

From an international business perspective, the firms and industries in this analysis are for the most part all global and are operating worldwide. Their product offerings are also global and do not differ significantly from country or part of the world. Consumer electronics and IT hardware and software are unique in the sense that the products are the same around the world. The analysis therefore covers the whole world. However data on sales and market size can be difficult to obtain for all markets, so the data on sales and market sizes cover only the USA since it is here it is best documented. However the analysis does also cover firms around the world. The value chain of design, manufacturing, distribution and sales of consumer electronics and IT hardware is one of the most internationally connected. Production is often done in Asia, the design of products and computer chips in the USA and Europe, and sales and marketing activities are separated but linked to the specific region of sale

4.2.2 Converging Industries?

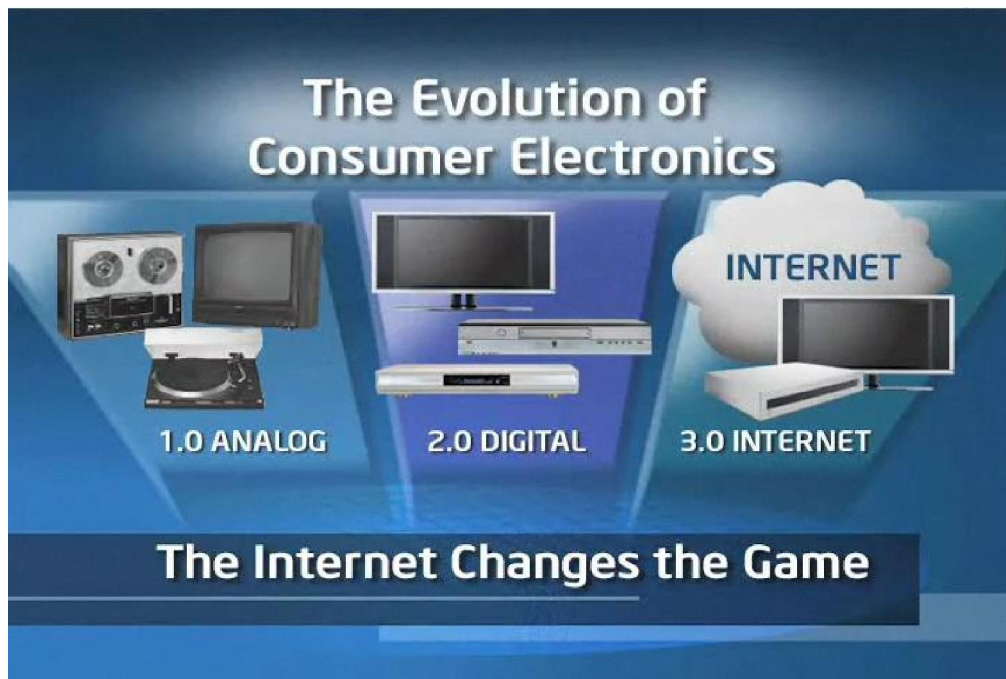
The reason for choosing to analyze the parts of the IT hardware and the consumer electronics industries is that the two industries are converging together into one industry.⁷ They are increasingly relying on the same buyers and suppliers and approaching the same complementors. The collapsing of industry boundaries and the role of complementors and standards is a central theme of alternative industry evolution as defined in the managerial model and theory. This analysis of the industries here will elaborate on that perspective. The model and the analysis will then be able to help managers understand and measure the shifts happening in their markets.

Since the shift from analog to digital see figure 3, the two industries have started sharing one key supplier, namely various types of semiconductor chips that handle video and audio.⁸ The internet has enabled digital devices with built in networking to be connected and download media files, which also is leading to an overlap between the two industries since buyers can now use a digital media file instead of their physical disc for playing the content. The analysis will reveal if the trajectories and the phase in their life cycle of the industries are affecting each other

⁷ Research from Park Associates, ABI and Isuppli are predict that products offerings from these industries are starting to overlap each other, see references and the activities section of the industry analysis .

⁸ Semiconductor firms Like Sigma Designs, Broadcom make chipsets that can be used both in Physical disc players and the seem chipset can be used in the digital media players.

by analyzing their buyer's suppliers and complementor's relationships, and whether they share technical platforms and standards.



**Figure 6 Evolution of Consumer Electronics,
Source: Intel Corporation**

4.2.3 Incumbent and Emerging industry of Digital media players

To clarify the different industries in this industry analysis, a separation of companies from different industries needs to be applied. The companies that focus primarily on physical disc players of digital media such as movies, and rely on closed standards for digital video formats are termed the Incumbent industry. The companies that rely on open standards of digital media formats and that focus on providing digital media players that rely on non physical means of playing media, i.e. so-called digital media files are termed the emerging industry. The illustration below show the common products offered from these industries.



**Figure 7 Examples of products from the incumbent industry of Physical Disc Players
Source: Sony and Samsung Corporation**



Figure 4 Examples of Emerging Digital media players and services
Source: Park Associates

4.2.4 Network externalities and Complementary Services and products

The analysis will include a review of the current and upcoming complementors to the industries. Here a complementor is not defined as a supplier or buyer to the industry but instead the complementors products and services can enhance or decrease the value of the products offered by the industry being analysed. They are part of the important creation of standards that govern the industries and thus co-creators to potential network effects in the analysed industries.

Digital content industry

The Digital content industry consists of mainly large Hollywood movie studios, but also more recently self generated video content on internet sites like YouTube and the more professional created content on Hulu.com which shows content from the main television broadcast networks. Many of the firms in the video players industries know that in order for their product offering to appeal to consumers they need premium content from this industry. Content as such is unique in its form. It is an asset that cannot easily be substituted. If a blockbuster movie or top notch new computer game is requested by the consumer, you cannot offer another second rate movie or video game, and it has to be the specific game or movie. Therefore the firms in the digital content industry can be seen as complementors to the firms in the two industries that are being analyzed. The digital platform industries need the assets from the digital content in order to be successful.

Digital Transfer Industry

The distribution of digital content has in many years been owned by the movies studios. The distribution have in the past been based upon brick & mortar retailers like Blockbuster for renting movies and other retails outlets for selling physical disc of movies. Viacom, a major movie studio, owned the largest rental chain of movies Blockbuster up until 2004. Movie theaters in the US and Europe are often owned by the movie studios. Major movie studios also own many of the channels that show digital content, i.e. Fox TV is owned by News corporations that again own the movie studio Fox Filmed Entertainment, HBO a cable TV movie channel is owned by Viacom. However there has been a diversification over the last years between the ownership of distribution channels of and the creators of content.

Recently have the internet been drastically chaining the distribution of digital content such movies and TV series. Today it is possible to rent or buy movies online through an online merchant in a non physical digital format. The content, such as music on a CD, movies on a DVD, are also becoming available in other formats and distribution forms. The forms are related to streaming movie internet service, and streaming movies in the home network. Consumers have been used to tuning in to a specific TV channel to see their favourite TV show are now experiencing that then can see this show on the internet or even download the show and take it with them on the road.

Illustration covering industries and complementors in the analysis

The model illustrates the new and the old producers of devices that can play movies either on a physical disc or trough a digital file, and the old and new complementors to the industries.

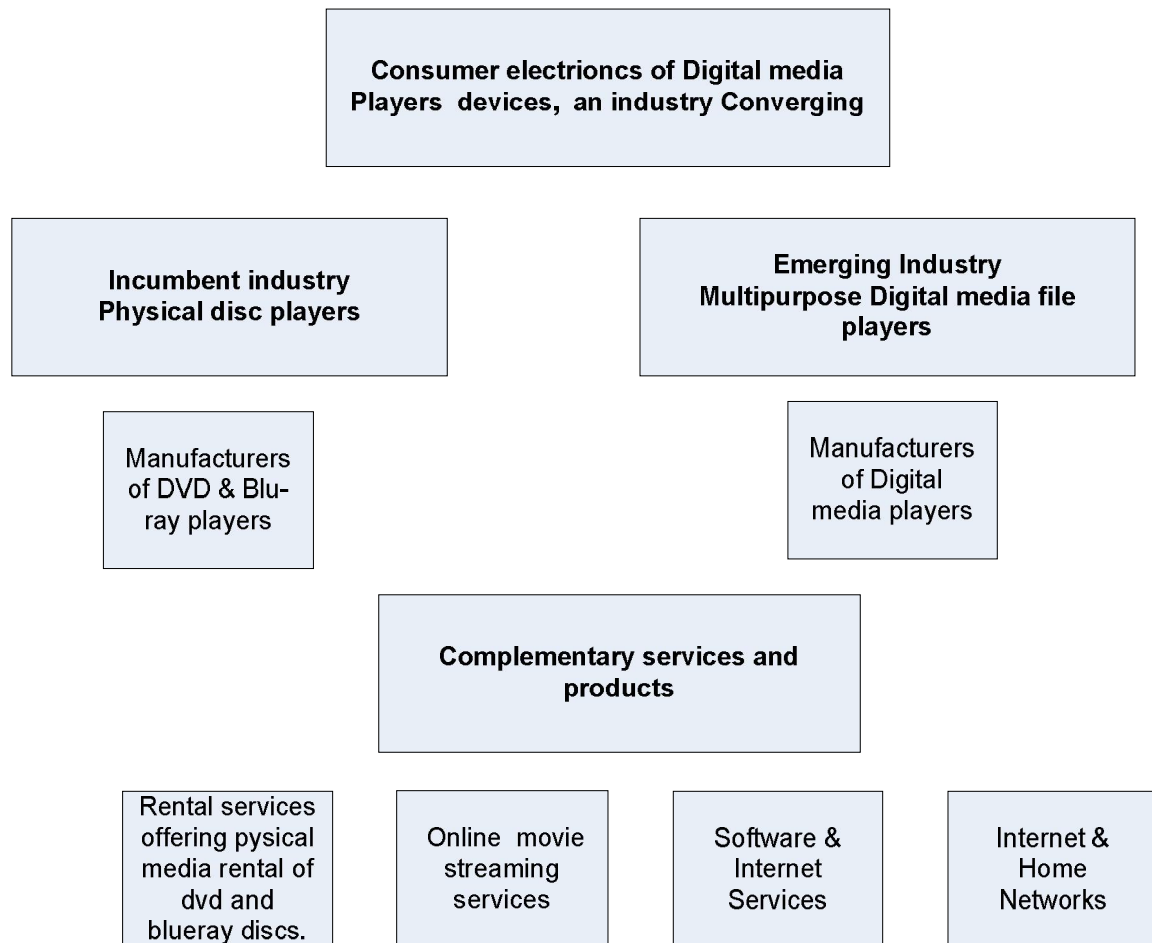


Figure 8 Overview of the converging industry and its complementors
Source: Authors creation

4.3 Determining if the industries are converging

The industries in this analysis are narrowly defined by segmenting what groups of firms that offer the same category of products or technologies and thus target the category of markets. As described in the introduction to the analysis the industries are consumer electronics companies that primarily produce physical disc players and the IT hardware procedures that produce non physical media players. They fulfil the same costumer need, namely watching movies and other video content in the home. They however at the moment not share the same core assets and activities.

4.3.1 The Incumbent Industry, Evolution of the Digital Video in the Consumer Electronics Industry.

This market for physical media players have for years been dominated and held by large consumer electronics manufacturers mainly from Japan such as (Sony), (Panasonic, Hitachi, JVC) and from Korea Samsung, LG and Philips (Europe) and a lot of producers from China with lesser known brand names.

The following section provides a brief history of home consumer video entertainment and the technological shifts that have governed the industry in the past. This will help determining the trend of convergence between the incumbent industry and the emerging industry.

The business of selling and renting video cassettes with movies on them, started in the early 80's with the emergence of recordable video cassettes that allowed consumers to watch movies in their home without going to the cinema. At first the movie studios were afraid of this new medium and resisted the change, since they were afraid that it would hurt their primary revenue source at the time, the movie theaters. However the VHS castes business soon became the single largest revenue source for the movie studio's sales of their products.

At first there was what is now classical marketing case study in battle for the winging format standard between the Sony Betamax standard and the JVC sponsored VHS system (Wiki). The VHS and Betamax systems were analog systems built upon tape and tape players. The Japanese electronic companies overtook the global market for VHS players since they owned the standard and defined the technologies, and their products were of a much higher quality than their American and European counterparts. The VHS system spurred the creation of a new industry of video entertainment in the home and generated new revenue and profits for the Consumer Electronics (CE) producers.

In the 1990's the digital revolution came to the movie industry with the launch of the DVD system like it had done for music industry with the compact disc years earlier. Here played also out a format standard battle between the DVD and DIVX system, but it ended much faster then the previous VHS versus Betamax battle.(Besanko 2007)

Movie studios and CE producers earned large profits on the format change since users replaced their home video libraries from VHS to DVD and upgraded the hardware platform from the VHS to the DVD player.

However the copy protection of the media content in the DVD system were hacked, this was possible since the format of the DVD were digital. Soon movies began to appear on the internet around the world without paying for the movies to the movie studios and royalties and licenses to the CE producers for the DVD format.

Consumers thirst for higher video quality in the home and the launch of the HD TV technology started the next evolution of the video content for home movies. Sony Corporation developed the blu-ray disc and Toshiba the HD-DVD. Another format battle like the VHS/Betamax was under way. The battle lasted a little over 4 years and ended up in 2007 with the Sony backed the Blu ray standard as the winner. At the same period between 1999 and 2002, but outside the incumbent industry of the consumer electronics, the digital video formats of Div-x;) and MKV were developed. These open source formats like x.264 standard made it possible for consumers to rip, store and transfer HD video online.

Today the problem that current producers of physical disc DVD and blu-ray players are facing is much alike to what produces of portable CD players were facing the in 1990's.

Over a period of less than 10 years, portable compact disc players were replaced by digital MP3 players. Sony and other consumer electronics producers lost the whole market of listening to music on the floor to newcomers from the IT hardware industry, i. e. Apple and Creative and Microsoft with their Ipod, Zen and Zune players. The same could arguable be happening now in the digital media player industry. Consumers are opting to use digital media players with digital video file formats such as div-x:) and x.264 MKV files that can be stored on a hard drive which can hold hundreds of movies on instead of DVD and blu-ray players that only hold one movie on a physical disc, having to change disc each the consumer wants to watch another movie.

4.3.2 The New Emerging Industry; Data on recent development

The company's products offerings in this industry are termed digital media players. Basically they rely on a new digital video format to watch movies in the home.

IT vendors have in this industry focused on providing media players that integrate seamlessly and other computer and networking equipment plus it the players provide direct access internet services for video distribution. In contrast, Incumbent Consumer electronics producers have put more effort in improving product features and manufacturing efficiencies, offering CE

standalone devices such as Blu-ray players with no linkages to content or other platforms.(NPD Group)

Consortia's such as DLNA of IT hardware producers and suppliers have worked on networking standards and digital video file formats, that have enabled consumers to enjoy videos on their computer. The IT hardware industry is leading to transferring the computers video playing capabilities to the creation of small digital file media players than can play movies without a physical disc inside them.

There is a proliferation of entrants that are joining the industry. According to the mpcclub.com, a website for DMA followers. Over 30 new DMA products have been introduced in the market over the last years (Mpcclub). Large storage companies like Western digital, Seagate and QNAP, are entering the scene. Network companies like Netgear, Linksys and DLink have their offerings. Computer maker Asus just announced their O!Play digital media player. Asian OEM producers and European producers are experimenting with new products coming out monthly; they include, Bloobbox in Italy, RaidSonic and Fantec in Germany, Blusen in Spain, Tivx and Xstreamer in Holland.

The analysis of the incumbent and the emerging industry of digital video players will reveal whether the Consumer electronics producers again are facing similar threat to their assets and activities as the producers of portable CD players did in the 1990's

4.4 Evaluating the Trajectories of the converging industries

4.4.1 Defining the boundaries of the industries

Incumbent industry

As told in the introduction, the market for physical media players have for years been dominated and held by large conglomerate consumer electronics manufacturers. The industry consists of firms from Japan, such as Sony, Panasonic, Hitachi, Toshiba, and JVC and from Korea, Samsung, LG and from Europe, Philips plus many low cost producers from China with lesser known brand names. To further define whether these firms are situated in the same industry, an analysis of the industry's common buyer suppliers and technical standards.

Common Buyers and suppliers

The retail prices of the products are very similar between the firms in the industry. The price elasticity between both the DVD players and the High definition blu-ray players do not vary much between the different brands, as seen in the price comparison figure. The figure shows average prices for 1 generation DVD machines and 2 generation Blu-ray machines in the second column. If prices of one of the firm were much higher consumers would opt for another brand. Therefore the price comparisons are a good indicator that the firms can be defined as competitors operating in the same industry. Around a quarter of all consumers would not express any difference between the offered players. This is reflected by that none of the players hold a market share over 25% in the US market. It is a very fragmented market with many firms offering the same product and consumers opt for price and features. Some consumers opt for the brand of the player but at least 25% do not have any preference in that way.

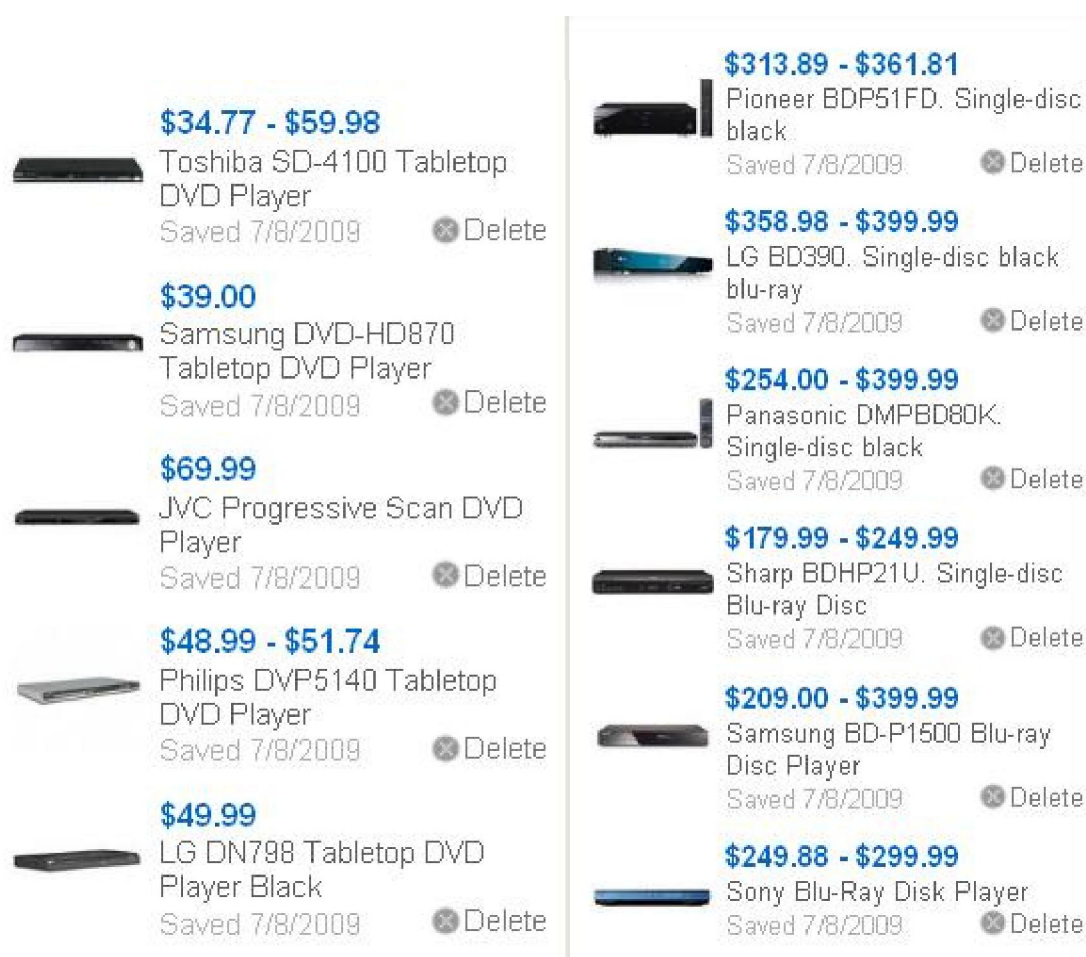


Figure 9 Price comparison between individual offerings of blu-ray and DVD players
Source: Smarter.com

Common Suppliers

As a physical disc player is a digital electronic device. It relies heavily on Semiconductors manufacturers that produce and price the different the player. There are many Semiconductor firms supplying various part to the firms they include firms such as Mediatek, SunPlus, Zoran and ESS.

But the firms all rely on specialized semiconductor chips for optical disc drives for procuring the players. An example of a common supplier is Lite-on supplier that produces optical drives for customers electronics firms such as Sony and NEC. Lite-on holds a 27 percent share of global production (Infoworld) in the optical drives in the world and thus is a common supplier to the industry.

Emerging industry

Common Buyers

The retail prices of the products are very similar between the firms in the industry. The price elasticity does not vary much as seen in the price comparison table. If prices of one of the firm where much higher, consumers would opt for another brand. Therefore is the price companies in a good indicator that the firms can to be defined as competitors operating in the same industry.

Around a quarter of all consumers would not express any difference between the different players. This is verified since none of the Players hold a market share over 25% in the US market. It is a very fragmented market with many firms offering the same product and consumers opt for price and features. Comparing their price to the Incumbent industry however shows that the players are priced comparative to DVD player sand Blu-ray players.

An overview of prices of the currently sold players in this industry are:

Western digital WDTV \$120
Seagate FreeAgent Home Theater \$110
Xtreamer \$135
DLink DSM-520 HD Media Player \$190
Syabas Popcorn hour A-110 \$215
Asus O!play \$129
Qnap NMP 1000 \$200
Linksys Media Center Extender \$200
Tivx 6500A \$250
Netgear EVA 9150 \$350

Table of Digital media players

Source: various source, from company websites and retailer shops

For an updated and current overview of current product offerings of digital media players, please check out www.iboum.com

Common suppliers

The common suppliers of the emerging industry are the semiconductor firms that supply the chipset that can decode the digital video files. The players that were present under the common buyers section all share the chipset the SMP8036 and the 1073 from Realtek. This chipset is made by the semiconductor firm Sigma Designs. Secondly the software for controlling the user interface is made by the company Syabas. The firm has created an optical user interface that they sell to the other producers in the industry. However Syabas also themselves market the digital media player Popcorn A.110, which was the first player and thus the one that has the largest group of followers at the moment of the players in the industry. Some of the players rely on the semiconductor competitors to Sigma design, called Realtek and use a different user interface, but these players still play the same digital video file formats as the rest of the players.

4.4.2 Determining the threats of the incumbent industry's core activities

Incumbent industry

The core activities of the industry include the selling and marketing of the industry products and their buyer's willingness to pay the price demand and the firm's ability to sustain profit in the business.

Looking at the latest annual report from the largest CE firms in the incumbent industry there seems to be a trend that the profitability of the incumbent industry is hurt badly at the moment. Over the last quarters 14 of the largest Consumer electronics producers have posted massive losses in profitability and drops in their revenues. Here are a few recent examples:

Panasonic slumps to \$4 billion annual loss for 2008 (USA Today)

Philips reports a net loss of EUR 57.00 million in Q1-09 (The Street)

Sony posts \$1 billion loss, first in 14 years for Q408 and Q109 (Engadget)

Toshiba posts \$1.76 billion in profit loss for 2008 (Channelweb)

Samsung Reports First Net Loss of \$14.4 million (Wall Street J)

LG posts loss of \$499 million for Q4 2008 (Reuters)

From looking at the reported financial data of the annuals report of Consumer electronics there must be a conclusion that they are hit hard on their ability to profit from their products.

To better understand these numbers an analysis of the buyers willingness to pay for the products especially for the new physical disc blu-ray player that is supposed to help return profit in the physical disc business is needed. The primary factor for the failure to generate profits on income is that Consumers are not willing to upgrade their current DVD players to the more advanced units with better picture and sound quality. The Os Sony pictures in USA even say in Forbes magazine that “It appears there is already price erosion in Blu-ray, so we are not making the price point we originally hoped for. We haven't really charged a premium for it. That makes consumers more likely to buy Blu-ray but less likely to pay a premium for it.” (Michael Lynton, CEO of Sony Pictures in Forbes magazine) (Forbes) An industry insider wrote on his blog that Blu-ray may be the winner in the optical hi-definition market, but the real war may be in getting customers to actually ditch the standard DVD first. It seems that Blu-ray is struggling. Sales for Blu-ray devices dropped a massive 40% at the beginning of the year, and have since only risen 2% back up. (Techspot) It seems that there is a problem for the industry to ask buyers to pay the demanded prices of their products.

4.4.3 Determine the threats of Incumbents industry's core assets

The core asset that have made the firms in the incumbent business able to sustain profit in the long run have been their ownership of Intellectual property rights, patent and licences around their digital video format of the physical disc either it be DVD or Blu-. These patents and licenses have made it possible for the Consumers electronics lobby to hold out cheaper producers and set a floor on the prices of the players over years and technology shifts.

This patent & license regime of the physical disc player

The basic principle since the VHS cassette have been to firstly win the standard war between competing formats, and then secondly monetizing on the standards of the physical disc by requiring other electronics producers and content creators to pay license fess on every player, recorder or empty media sold. In addition, there are license fees for the use of compression system, the audio system, and the entering the club of producers have required upfront annularly

license fees. This has helped keeping the alliance of CE producers that defined and created the standard an exclusive club and has also deterred entry of new producers in the low end.

The value of owning the format for digital video

Japanese Consumer electronics producers have in the past owned the patent and licences to the DVD and blu-ray standards, besides the revenue from sales of compatible players they have to a large extent profited from the revenue that the royalties from the patent and licence sales have given them. It is not possible from the revenue and annual reports of the large incumbent Consumer electronics firms to estimate how the rate of depreciation are on these assets of patents and licenses on the standards bring in. However the consortium of Blu-ray licence holders the BDA has dropped the price of licensing the blu-ray standard by over 40% in 2008.(Gizmag) This could indicate that the backer of the format the incumbent firms are not able to earn their return on the investment in the format. This could also indicate that buyers (i.e. smaller producers) that want to manufacture and sell players using the patents licenses are not willing to pay the demanded prices for using them.

Complementors like content providers such as movie studios, had to pay for using the standard, the disc and the whole ecosystem. The power over the standard gave the firms room and time to develop and research new technologies. They could also control the migration and profit from users converting their media libraries from one physical format to the other (Forbes)

This core asset has become under threat over the last year from the development of so-called open source digital video formats.

Development of alternatives to the closed Digital video formats

Many entrepreneurs in this IT hardware industry do not want and cannot pay the high license fees, therefore they have used reverse engineered Digital video file formats created by software developers to circumvent the licenses. *“Last I checked with EGreat China they said it was too expensive. Syabas reported that it was upwards of 100,000 USD for the license for the DVD format” (Mpcclub 2)*

This led to the popular DivX format 1998 that made it possible to compress and make a digital video file the same quality as a DVD, In 2002 the digital video for X.264 and the competitor KV have made it possible to stream and download digital video file format in high quality as blu-ray physical disc. These file formats were first used on the computer platform and mostly used to watch video online. However in the last 5 years these digital video formats have been used to

create the consumer devices that can connect to a flat screen TV and watch the digital video by a non physical disc player in the living room. The source of players that through open source digital video formats can handle the same video and sounds without paying for the license is hurting the traditional producers. The loss of profit and revenue for the incumbent CE firms is stemming from this approach. With non physical disc players and the ability to stream movies online, CE producers loses the power and revenue stream and become mere box producers with no say on the direction of the digital video format standard and the revenues that come from owning it. Basically standards were the way to sustain profits in a highly competitive market. The network effects assured them sustained competitive advantages and profits streams. This development is a major threat to their core assets of patent and licenses around the physical disc format such DVD and Blu-ray.

4.4.4 What trajectories are the converging industries on?

Incumbent industry

The analysis has revealed that the incumbent industry of physical disc players is under threat from the emerging industry. Their core assets of patents and licences are being eroded by new open source video file format that require no fees to use. their actives is also under threat because early adopters and later on mainstream buyers do not value their products capabilities high anymore and not willing to pay a premium for new technologies of i.e the blu-ray disc players. Therefore the conclusion is on the analysis of the incumbent score assets and activities that the CE industry is under the worst form of industry change that an industry can be in where both their assets and their actives are under threat.. They are on a radical trajectory one change where both their assets and activities are starting to fail to generate profits and revenue. The trajectory of evolution for the industry is therefore on a radical

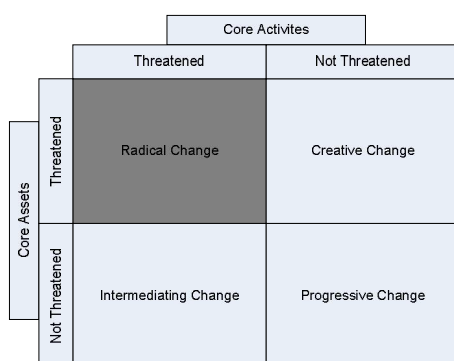


Figure 10 Trajectories of Incumbent Industry of physical media players
Source: Authors creation

Emerging industry

The emerging industry is slowly but surely building up their core assets and activities around the connected digital video file players. They are still in the process of moving toward the consumer electronics industry but the threat they pose is very clear, their intent are to over take the market for physical disc players, as the CEO of the on of the Emerging firms stated their online consumer forum *It is our strategy to make the media players a real alternative for DVD machines. (Xtreamer)*

Even though the analysis have not provide an in depth analysis into the core assets and activities of the emerging industry, they are assumed to be on progressive path of evolution in their industry.

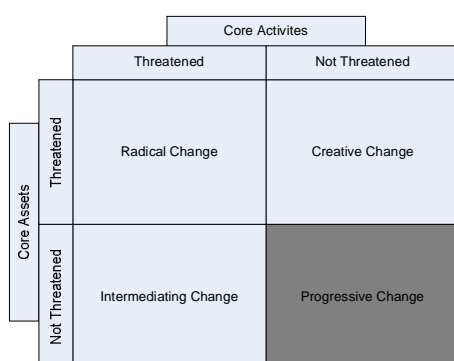


Figure 11 Trajectories of Emerging Industry of non physical media players
Source: Authors creation

4.4.5 Determining the stage of evolution between the two industries.

To assess if profits are being lost to newcomers from the emerging industry the following assessment of volume and growth rate for the physical disc player industry is done.

Total market volume of incumbent industry

The total market of physical disc players in the US households today is around 150 million DVD players. DVD players can be found in 85 percent of U.S. homes (NPD research, 2008) and the number of US households according to US Statistics bureau is 111 millions. The average household in the US has 1.5 DVD players. So the total number of DVD in the US amounts to 141 million players.

The total number of High definition blu-ray players in the US market in 2008 is between 2.2 and 2.6 million players. This number also includes the sales of the Sony Game Console that has a blu-ray player built in. Since the game console also is used for gaming, it does in this analysis not classify as a dedicated blu-ray video format player. According to Sony Computer Entertainment America they sold over 1.2 million PlayStation 3 units during the holiday period from November 23 to December 31, 2007. So the real number is actually only between 1 million to 1.4 million players.

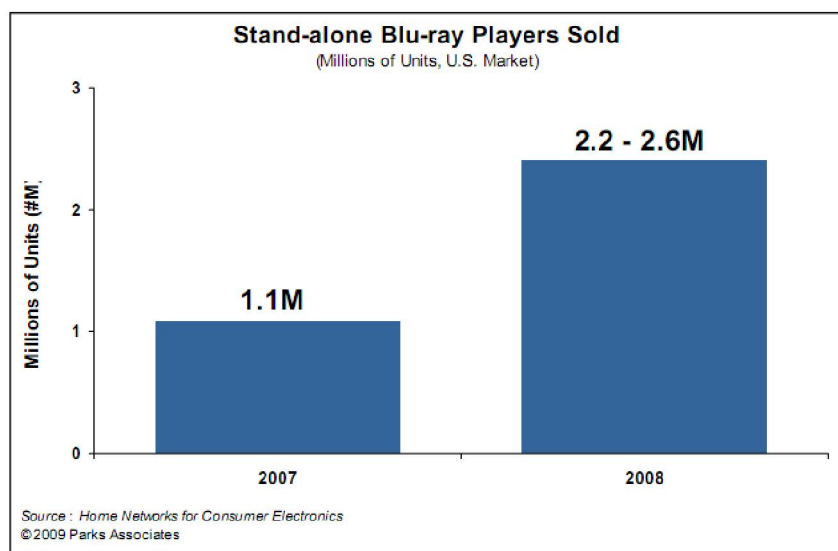


Figure 49 Stand-alone Blu-ray Players Sold in U.S.

Figure 12 Sold blu-ray players in the US
Source: Park Associates

Emerging industry

Since the market for digital media players is in its starting phase, there is little industry reports on its total volume and market size. One research firm Park associates number the amount of DMP to current number of Digital media adapters in the US: 1.3 million. Another measure of the total market can be done by estimating the number of players based upon revenue of the chip company Sigma Designs since all of the DMP rely on the same CPU chip from the same supplier. Only recently have Realtek began to be seen in the market place.

Sigma Designs states in their 2008 annual report that 81% of their net revenue 221.206.000 million \$ came from their SMP8630 Chipset series which is the chipset used in the DMP's. This amount to \$179.000.000. However the chipset is also used in HD-DVD physical media players. (Sigma Annual report 2008 Investor call)

Sigma designs states in their annual report that the revenue from HD-DVD and other media players Chipsets amounted to \$49 million in 2008, 24 million in 2007 and 11 million in 2006. Of the sales of these chipset an estimated number of 50% are sold to DMP producers. That amount to the 25 million of the \$49 million. The average selling price is \$25 per chip which divided equals up to about 1 million DMP's sold. So the number 1.4 million players seem like a good measure of total volume of the emerging DMP market ending 2008.

Differences in total volume between incumbent and emerging industry

comparing the volume of the emerging industry with the total number of DVD players in the market and the new blu-ray players, the incumbent industry have a total market volume of around 113 million units, whereas the DMP industry for now have sold between 1 to 1.3 million players. The incumbent industry has such a higher volume than the digital media players from the emerging industry, that the stage of radical trajectory is still in its infancy. They would be in stage Emergence based on these findings.

However if the firms compares the total volumes of new Blu-ray players versus the volume of the Digital media players each account for a significant share of the total volume of new high definition media players and by that metric alone the stage of radical trajectory would already be in the stage of Convergence. To further set the stage a look into the growth rates of both industries is needed.

Emergence	<i>Growth in the new industry is not high enough to cause volume convergence between the two industries</i>
Convergence	<i>Growth in the new industry compared to growth in the old industry is high enough to cause convergence in volumes between the two industries.</i>
Co-existence	<i>Grow rates in the new industry is slowing but higher than old industry. Each account for a significant share of volume yet growth is slower than in the convergence phase.</i>
Dominance	<i>When the volume of the new industry is higher than in the established industry.</i>

Table 5 source: Authors creation adapted from McGahan (2004)

Growth rates between the industries

Since there is hardly no public data on the growth rates of the emerging digital players and the growth rates of the sales of BD players is questionable because the research firm that publishes data of the sales of blu-ray players (NPD Group) will not publish specific data because they are afraid the data will unveil retailers names because of low sales, other measures must be applied. However one indicator of the % of sales form NPD group have been published. Blu-ray standalone players plummeted 40 percent from January 2008 to February, then rose a scant 2 percent from February to March.(NPD group)

The growth rates for the incumbent and the emerging business can be implicitly be measured by the expectations in sales of physical and non physical video players over the next years. The key chipset supplier to both Blu-ray players and to Digital media Players, Sigma Designs states in the their latest investor meeting that: *Next (is the) digital media adapter market for which Sigma has enjoyed a dominant position while the market interest develops. Recent events have increased the appeal of this market and we are now **expecting increased contributions** over the next several quarter, (and further on) we are hopeful it will continue it's growth and become a long-term revenue stream.*(Sigma quarterly investor call Q1 2009)

Leading research firm Isuppli studying the industries estimate that global shipments of consumer-electronics devices capable of supporting Internet video are set to rise by nearly a factor of five from 2009 to 2013 (Isuppli Research) and Yankee group expects that by 2013. By 2013, U.S. households will have: 30 million connected Blu-ray players and 11 million digital

media adapters (Yankee) If the assumption of the numbers by Yankee holds true that would mean according to the table above, that the growth rates of the Blu-ray player would be higher than the growth rates of the Emerging digital media players. Since they both start at 1.4 million in 2009. The other expectation of a five fold increase in connected internet video devices is a two board measure of growth rates since it could easily be applied to both industries. In conclusion, there is not enough data to understand, where the industries are at the stages toward each other. To be sure of the stage of the trajectory between the two industries, an analysis of mainstream buyers and specialized buyers are opting for at the moment.

Analysis of mainstream buyers and specialized buyers view on the product capabilities

Researching relevant data on what specialized buyers in the industry of digital video players in not an easy task for outsider to the industry, The internet however host many discussion forums for hobbyists and videophiles that discuss the latest and greatest product from the industries. The thesis have chosen the largest English-based Audio video forums, where both professionals developers and common users debate the products. For example the Hardware developers from Sigma Designs often debate in the forums. Western Digitals Products managers launch and debate their new products on these forums. The chosen community forums have a total member base over 10 million users.

These online discussion forums such as avsforum.com and avfourm.co.uk talk about all types of digital video products both blu-ray and digital media players. A forum is built on threads and one can see how many times a given thread have been read, the higher number of time it has been read the more interesting the product must be to buyers of these products. The two most popular thread on digital media adapters have gained a number of read times (views) of over 191,943 and 150,248 on avfourm.co.uk (Avfourm) on the other discussion forum the five most popular threads on the digital media players have a combined read of over 2.5 million views.(Avsforum)

From these numbers it can be concluded there is an interest among viodephiles buyers of the products of the emerging industry.

In order to understand why early adopters are using the one has to look at the attributes of the products capabilities in comparison with the old products. In reading the discussions in the forum on the new products 13 key attributes of the new digital video file media players.

1. Digital movie catalogue
2. Ability to stream online video content
3. digital meta data on digital movie collection such as movie posters and plot and of the movie
4. Windows like User Interface
5. Ability to Copy and Stream movies without limitations.
6. Seamless integration with home network and other networked devices in the household.
7. Ability to view photos and play music on same device.
8. No wear and tear on the media files like on a physical disc.
9. Faster load of media files compared to loading of a Blu-ray movie disc 40 sek+ vs 3-4 sec.
10. Support for multi language subtitles and homemade subtitles.
11. Support for popular networks standards like NFS, SMB and Upnp/DLNA.
12. Noiseless playback and no moving parts make player more reliable and quit.
13. Support for universal Remotes such a Harmony and Web based RC client on i.e. Iphone and web based.

Early adopters' value the new capabilities that the DMP offer over the traditional players from the incumbent industry. The capabilities are numerous, but the most important are, the ability to store more movies on one device, not having to change disc each time the consumer wants to see a new movie, The ability to copy and stream movies to the device from the internet or from a computer in their home network. The ability to connect to meta data info on the movies the ability to create a digital media catalogue of their movies on the hard drive . A rich user interface that resembles the GUI on their PC. The ability to watch internet video services such as Youtube and Picasa. The ability to update the player, when new firmware is issued. Secondly most movie devices also support the view photos on it and some even support playing music on them. Some users like the jpg to be able to show their photo album on the device. The physical media players also support the viewing jpg photos, but the photos have to be burned to a physical device beforehand , which is unfortunate, because most users already have their photos on a computer hard drive. More importantly it seems that early adopters are opting for DMP instead of Blu-ray players because of these new attributes and features.



Figure 13 Example of digital movie collection program
Source: Mymoivs.com

Where are they in the phase of converging industry market.

At the moment according to early adopters the new media players are judged better in most aspects in comparison with the old. However the old players still handle some video and sound formats better such as high definition surround sound. The performance of the new players have improved dramatically the last two years, but mainstream buyers do not yet rate the overall value of the products to be the same as the old ones, since they do not know them yet, and they do not fully understand the capabilities of the new devices. From a buyer's analysis, the two industries are on the face on convergence, but have still not moved to the stage of co-existence.

Emergence	Some buyers opt for the new industry's products
Convergence	Performance by new approach improves dramatically
Co-existence	Mainstream buyers rate the overall value of the new products to be the same as the old product. New products perform in some way better on one or more attributes
Dominance	When new products are judged better in all aspects of performance than the old by mainstream buyers.

Table 6 source: Authors creation Adapted from (McGahan, 2004)

4.5 Aligning Strategies, Assets, Activities and Investments.

The following part of the analysis concerns only the incumbent industry, since the emerging industry did not show signs of threats of their assets and activities, they should focus on expanding their industry and polishing their current business model for further growth. The incumbent industry however will need to see how they can align their assets and activities to the change coming from the emerging industry.

The companies in the incumbent industry should try to partner with entrants into the emerging industry for access to technology and key supplier relationships. Having assessed that their current core assets and activities are failing to generate revenue, they should begin to partner with firms in the emerging industry. Their focal point should be that of gaining knowledge of the new industry.

In the radical trajectory of evolution the managers of the firm should develop a strategy for either exiting the business in the long term and or decide where its current assets and activities could be deployed in another industry or try to leapfrog the evolution of the industry by diversifying away from it in

Toshiba one of the largest firms have already begun to align their investments, they have decided to exit the business of physical disc media players. The quote from the manager Brass f Toshiba *“Bass went on to defend the company’s decision to side-step Blu-ray and concentrate on developing online products. ‘We’re one of the most patented companies in the world,’ said Bass. ‘We’re big in storage and semi-conductors, not just electronics. And our strategy to focus on download (of movies) has already paid off. If you look at sales data, it wasn’t a Blu-ray Xmas; sales of DVD players and DVD software continue to dwarf sales of BD. (Home Cinema)’* The statement clearly shows that Toshiba has evaluated their current assets and found out that it does not create value in the long. They are divesting from the business and scaling down their commitments.

Firms in this phase can also massively reinvest in the emerging industry. That has been the path that Sony has chosen. As their CEO announced in their annual investment meeting Thursday, Sony began to publicly outline their blueprint for restoring profitability. In their consumer

business; “At the center of it (strategy) a keystone will be networking – connected entertainment appliances”. *Sony is planning to spend \$16.7 billion over three years (through March 2011). The aim will be to become “the leading global provider of networking consumer electronics,”* *Stringer says. By the end of the process 90% of Sony’s product categories will have networking and wireless capabilities.*(Metue)

Sony is trying to invest in the new business and are indicating with these moves that they are trying to catch up with the competition and trying to make their precuts like the merging industry by connecting them to the internet.

Aligning the investments to the stage of industry evolution

Which of these two strategies will be the most suitable for the respective firms? According to the analysis on where in the phase of change between the emerging and the incumbent industry the industries are in the phase of convergence where *Growth in the new industry compared to growth in the old industry is high enough to cause convergence in volumes between the two industries*. So the strategic response would be, like Toshiba have chosen, to exit the incumbent industry for a radical change, however since the phase of change is at the moment only causing the volume of sales to merge, the incumbent might have time to reconfigure their assets and activities to the change. So in case of Sony current strategy, Sony might have time to catch up with the competition since the industries are still in converging phase and not already in the coexist or dominance phase. In the converging phase the firm should try to choose to become the standard in the industry by focusing on distinctive features of their products offerings, while at the time starting to understand how they can optimize their production and make costs a issue. For Sony that means to actively participate with the competitors in standards creation of i.e. the network capabilities of the new digital media players. As their experience with low cost products and manufacturing can help them in gaining a foothold in the new industry by focusing on managing cost of their products. However it is the highest risk of the two strategies, and Sony have had troubles as we saw in the third section of keeping product, and seeing their revenue decreasing over the past year.

4.6 Creating Partnerships, Standards and luring Complementors

The incumbent industry will need to create partnerships with the firms in the IT hardware and networking industry to be part of the process of creating the new standards for transmission of

video and sound in the home. They will furthermore need the knowledge and know how of the networking industry in order for them to make their products connected to the internet.

The firms in the incumbent industry need to create partnerships with online content providers such as the self generated content site Youtube.com, in order to lure the content complementors to support and their online services into the incumbent products.

The incumbent industry need to embrace the digital video format used in the online world. Therefore do the firms in the incumbent industry need to form partnerships with the digital video format complementors that hold and administer the licenses and patents to the online world's digital video format. .

The incumbent need to create partnerships with software firms that create software application such s meat data on movie collections and software their make the user interface in their products more appalling and easy to navigate.

4.6.1 Creating Partnerships – with complementors that have assets and activities

The incumbent industry will need to create partnerships with the firms in the IT hardware and networking industry to be part of the process of creating the new standards for transmission of video and sound in the home. They will furthermore need the knowledge and know how of the networking industry in order for them to make their products connected to the internet.

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4.6.2 Creating Standards with competitors to form an standard

Some Consume electronics companies are trying to gain a foothold in the process of creating standards for transmission of video and sound in the home. The most prominent partnership alliance for promoting a technological standard at the moment is the Digital network living alliance called DLNA and UPNP. DLNA was founded in 2003 by 17 PC and CE companies to provide guidelines and a standard for building interoperable electronic devices. DLNA is viewed by many consumer electronics companies as the “starting glue” for creating connected product ecosystems.

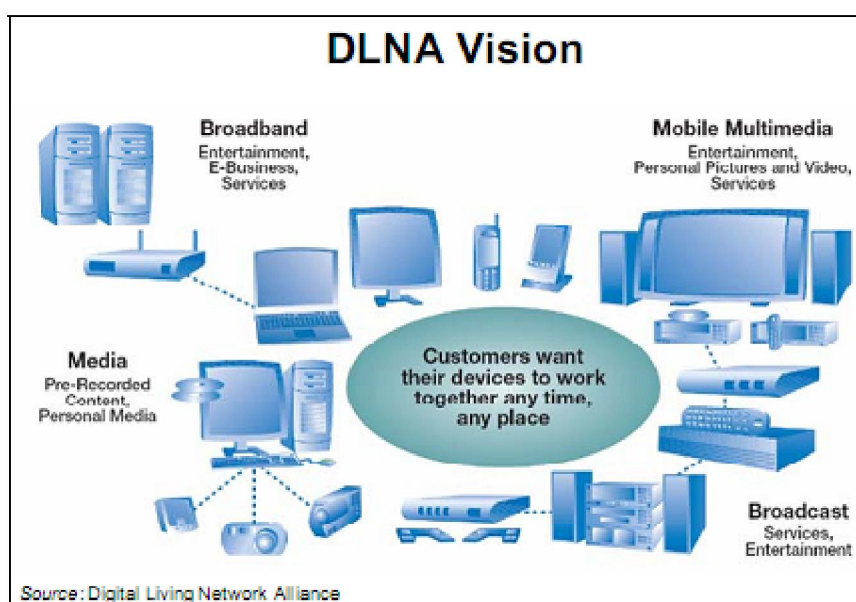


Figure 70 DLNA Vision

Figure 14 Source: Digital Living Network Alliance
Source: DLNA

The Vision of the DLNA is shown in the illustration above. Basically what CE firms and the Hardware firms have entered into this open alliance where they share knowledge and define the standards for how to transmit video over the network, and how different consumer devices can guide each other on the home network. The standard for the DLNA have been initiated by firms for the IT domain such as Intel and Microsoft. They have together with CE firms decided on

what on how physical and digital medias can find and connect to each other and to computer and devices that i.e., hold a movie catalogue. (DLNA)

The big difference here is that it is not only the Incumbent firms that decide the standards but they do so in cooperation with the IT hardware industry, thus they are actually collaborating with their competitors. The intent of the IT hardware industry is to sell their chipset and software stack to the large CE industry and the CE can offer them their brand and large installed base of customers their making and manufacturing power that some of the IT hardware industry do not have at the moment. This example shows that firms in the incumbent industry are actively trying to catch up the emerging industry and are collaborating with them in order to gain the needed assets and create the standards for the future of the digital video players.

4.6.3 Luring Complementors

The firms in the incumbent industry need to create partnerships with online content providers such as the self generated content site Youtube.com, in order to lure the content complementors to support and their online services into the incumbent products.

The incumbent industry need to embrace the digital video format used in the online world. Therefore do the firms in the incumbent industry need to form partnerships with the digital video format complementors that hold and administer the licenses and patents to the online world's digital video format.

An example is LG an consumer electronics firm from the incumbent industry. *LG entered into agreement with the DIVX so that their physical disc Blu-ray player allows consumers to enjoy Div-X(R) HD videos up to 1080p on the TV via DVD, USB or streamed over a home network (DIVX) DivX creates, distributes and licenses digital video technologies that span today's consumer media environment. Over 100 million Div-X Certified devices have shipped into the market from leading consumer electronics manufacturers.* (DIVX)

The incumbent need to create partnerships with software firms that create software application such s meat data on movie collections and software their make the user interface in their products more appalling and easy to navigate.

An example of meta data, the data that display information about a movie and picture of the cover of the movie, is called YE another movie box , this has been very popular on the digital media players. Sony has copied this approach with their new service for their Blu-ray players.

Instead of luring a complementor software firm to supply meta data to their players, Sony instead bought the firm Gracenote(Paidcontent) and have recently announced that the new software called MovvieIQ will be enabled on Blu-ray Discs and an internet-connected Blu-ray player. The software lets movie fans access continuously-updated information on cast and crew, and shows pictures of the movie cover.

Another popular feature of the digital media player offer above the traditional physical disc players is the ability to watch free online content such as home videos on youtube.com. The incumbent firm have realised that it is a 'must have' feature, but so far only the electronic producer LG have offered this feature on their upcoming Blu-ray player. LG announced today that as their new BD370 Blu-ray player will also stream content from YouTube. (Techdisgest)

4.6.4 Industry Analysis Conclusion

The analysis revealed that the incumbent industry of physical disc players are on a radical trajectory of evolution where their ablaut to earn a return on investments since their core assets are failing to generate the needed value and their ability to generate a profit on their activities are struggling. Furthermore did the analysis conclude that the incumbent industry is on converging stage where the industry's where core assets and activities are being valued less much less than the attributes of the emerging industries products attributes, and thus are some of their buyers opting for the other industry's products. Another conclusion of the industry analysis is that The incumbent industry of physical disc players need to align their current assets and activities, One way for them is to enter into partnerships to gain hold of the emerging industry s new assets and to participate in standards creation with the emerging industry players in order to sustain competitive advantage in the long run.

Chapter 5

5 Main Conclusion and discussion of Thesis

The main objective throughout the thesis was to construct a managerial model to formulate strategic direction for firms in assessing their industry evolution and secondly the objective was to use the model in analyzing the patterns of change in the incumbent and the emerging industries for digital home consumer video, and to elaborate on possible evolutionary paths the industries are following. The results of the thesis are based upon an empirical industry analysis of the global digital consumer video industries, and on information about the trends in the industries derived from industry specific reports, articles, and interviews. The findings from this empirical work were combined with managerial model and the chosen theories to answer the research questions

The three main research questions of the thesis were:

How can the firms assess the type of trajectory change in their industry to understand if the change is threatening its core activities that generates profit for the firm and if the change is threatening its ability to generate a return of investments on its core assets. How can firms respond and align to these changes in order for it to remain competitive?

How can one construct a managerial model based for firms to use in their strategy formulation and business execution to assess core assets and activities and the need of partnerships and complements to stay competitive in their industry if it is converging with other industries?

How can firms that participate in the market of digital consumer video players to consumers, apply the managerial model on their industry to assess if core assets and activities are coming under threats of generating profits and revenue from emerging industries?

The result of the industry analysis in chapter 4 came to the conclusion that the incumbent industry of physical disc players are on a radical trajectory of evolution where their ability to earn a return on investments since their core assets are failing to generate the needed value and their ability to generate a profit on their activities are struggling. Furthermore did the analysis conclude that the incumbent industry is on converging stage where the industry's where core assets and activities are being valued less much less than the attributes of the emerging industries products attributes, and thus are some of their buyers opting for the other industry's products. Another conclusion of the industry analysis is that The incumbent industry of physical disc players need to align their current assets and activities, One way for them is to enter into partnerships to gain hold of the emerging industry's new assets and to participate in standards creation with the emerging industry players in order to sustain competitive advantage in the long run.

Thus it can be concluded that chapter 4 answers the third Research question:

How can firms that participate in the market of digital consumer video players to consumers, apply a managerial model on their industry to assess if core assets and activities are coming under threats of generating profits and revenue from emerging industries?

The conclusions of Chapter 3 were that a managerial model was created, that contains that needed measurable parameters in a reoccurring illustrated model. The model can be used to evaluate an industry's evolutionary trajectory. Second can the model be applied to determine how to align the industry's assets and activities to industry evolution. Furthermore does the model pose relevant questions and exercises the firm can make in order for it to align its assets, activities, investments and strategy in order for it to align these investments with the measured industry trajectory that are underlying for their particular industry. Finally can the model work to pose relevant considerations on how, the firm should create partnerships, standards and lure complementors for access to their complementary products and be used to partner with firms for building needed new assets and activities. The model can thus be used for industries that are facing convergence in their market and apply the model to determine their current industry evolution and determine the phase they are in the evolution of the industry trajectory.

Thus it can be concluded that the model answers the second research question:

How can one construct a managerial model based for firms to use in their strategy formulation and business execution to asses core assets and activities and the need of partnerships and complements to stay competitive in their industry if it is converging with other industries?

In Chapter 2 the objective of chapter two was to review and choose relevant theories to include in an analytical framework that were to be used in constructing the model in chapter 3. The conclusion of chapter 2 is that the relevant theories for constructing the model have been chosen and that the theories would prove sufficient for structuring and creating an understanding of the type industry dynamics that govern industries evolutionary trajectories. Secondly did chapter 2 introduce theory on network economics and showed how to combine these theories with the theory on industry dynamics. .

All together the chapters 4, 3, 2 have together answered their first research question:

How can firms asses the type of trajectory change in their industry to understand if the change is threatening its core activities that generates profit for the firm and if the change is threatening its ability to generate a return of investments on its core assets. How can firms respond and align to these changes in order for it to remain competitive?

Thus is can be concluded that the thesis have answered the posted research questions that were posted in the beginning of the thesis.

5.1 Discussion of findings.

The analysis of the industries in the converging industry of digital consumer video unveiled a few shortcomings of the applied managerial models methods for industry definition. First, when attempting to define the boundaries of the incumbent and the emerging industry, the managerial model proved insufficient to draw the boundaries around the fragile and very dynamic structures of an emerging industry. The framework of the model worked out well in analysis the incumbent industry, but alternative methodologies and theories, on how to measure the emerging industry could be better defined. Especially with the perception and the needs of the business practitioner, because it is typically those, who create and define the new markets and are in command over the industry's developments. Furthermore should the model be used on other industries to see its applicability in these other industries. Specifically industries that rely on technology standards or technologies that are moving from an analog platform to a digital, i.e. the book & magazine industry could be of interest in using this model. The semiconductor industry can also use the model the findings of this study. The current change from where one powerful general purpose processor like an Intel CPU and offline proprietary expensive software could handle all applications and media, to the new paradigm where smaller integrated devices based on specific SoC semiconductor designs and customized free software can use the thesis to understand how to navigate in the semiconductor market and the end products that spring form these industry changes.

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Interviews

Hvid, Erling Linksys Kiss technology, Email and Telephone interview

Ken Lowe Sigma Designs, Investor Transcript

6.2 Glossary of Terms

Codec	Device or computer program capable of encoding and/or decoding a digital data stream or signal.
Blu-ray	HD Digital Video format for physical discs
DVD	Normal Digital Video Format for physical discs
GUI	Graphical user interface
MKV	Free HD Digital Video codec Container
Divx;)	Free Digital Video codec Container
Divx	Licence based HD Digital Video codec Container
Xvid	Free HD Digital Video codec Container
DTS	Licensed based Digital audio format
VoD	Video on Demand refers to the transmission of movies via digital cable or IPTV on the internet
X.264	x.264 is a free software library for encoding video streams into the H.264/MPEG-4 AVC
H.264	H.264/MPEG-4 AVC is a standard for video compression.
M2TS	M2TS file is a Sony high definition video file type. The M2TS file format is one of the three mandatory supported codecs (MPEG-2, H.264/MPEG-4 AVC, and SMPTE VC-1) used on Blu-ray discs.

7 Appendixes

7.1 Overview of the firms in the incumbent and the emerging industry

Traditional Consumer electronics Industry.			
Philips			
Samsung			
Sony			
Toshiba			
Panasonic			
Pioneer			
Sanyo			
Hitachi			
Sharp			

Players in the Emerging Industry of Digital Media Players

Computer Network Industry			
DLink			
Netgear			
Zyxel			
Linksys			

Storage Industry			
Western Digital			
Seagate			
Lacie			
Iomega			

Network attached storage industry			
Qnap			
Raidsonic, Buffalo			

Newcomer Hardware producers			
Asus			
Syabas			
Mvix Xtreamer			
ACRyan			
Conceptronic	Emtec	Freecom	Dvico

Connected Consumer Electronics			
Connected Game Consoles			
Media Center PCs			

Multi-room DVR and Connected Set-top Boxes
Digital Media Adapters
Cloud Media Set-top Boxes
Connected TVs
Connected Blu-ray Players

7.2 Example of royalties payment for use of the DVD license

Royalty Rates under DVD6C Licensing Program

The current royalty rates applicable to new licensees who entered into the DVD6C License Agreement ("Agreement") are as follows:

As of July 1, 2008

Category	Royalty Rates
DVD-Video Player	The greater of (i) 4% of the net selling price or (ii) US\$4.00 per player or, US\$3.00 per player on or after the effective date of the DVD6C license agreement US\$8.00 at maximum on or after January 1, 2003
DVD-Audio Player	The greater of (i) 4% of the net selling price or (ii) US\$4.00 per player or, US\$3.00 per player on or after the effective date of the DVD6C license agreement US\$8.00 at maximum on or after January 1, 2003
DVD-ROM Drive	The greater of (i) 4% of the net selling price or (ii) US\$4.00 per drive or, US\$3.00 per drive on or after the effective date of the DVD6C license agreement US\$8.00 at maximum on or after January 1, 2003
DVD-ROM Disc	US\$0.075 per disc; US\$0.065 per disc on or after January 1, 2002; US\$0.05 per disc on or after January 1, 2004; US\$0.04 per disc on or after the effective date of the DVD6C license agreement
DVD-Video Disc	US\$0.075 per disc; US\$0.065 per disc on or after January 1, 2002; US\$0.05 per disc on or after January 1, 2004;

	US\$0.04 per disc on or after the effective date of the DVD6C license agreement
DVD-Audio Disc	US\$0.075 per disc; US\$0.05 per disc on or after January 1, 2004; US\$0.04 per disc on or after the effective date of the DVD6C license agreement
DVD Decoder	The greater of (i) 4% of the net selling price or (ii) US\$1.00 per decoder US\$0.50 per decoder on or after the effective date of the New DVD6C License
DVD Video Recorder	The greater of (i) 4% of the net selling price or (ii) US\$6.00 per recorder
DVD (Recordable Disc) Drive	The greater of (i) 4% of the net selling price or (ii) US\$6.00 per drive
DVD Encoder	The greater of (i) 4% of the net selling price or (ii) US\$1.50 per decoder US\$0.75 per encoder on or after the effective date of the New DVD6C License
DVD-R Disc	The greater of (i) 4% of the net selling price or (ii) US\$0.075 per disc; US\$0.045 per disc on or after January 1, 2006
DVD-RW Disc	The greater of (i) 4% of the net selling price or (ii) US\$0.075 per disc or, US\$0.065 per disc on or after the effective date of the DVD6C license agreement
DVD-RAM Disc	The greater of (i) 4% of the net selling price or (ii) US\$0.075 per disc or, US\$0.065 per disc on or after the effective date of the DVD6C license agreement
Recordable Disc Case	The greater of (i) 4% of the net selling price or (ii) US\$0.005 per case
+R Disc	The greater of (i) 4% of the net selling price or (ii) US\$0.075 per disc or, US\$0.045 per disc on or after January 1, 2006
+RW Disc	The greater of

	(i) 4% of the net selling price or (ii) US\$0.075 per disc or, US\$0.065 per disc on or after the effective date of the DVD6C license agreement
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Price for using the blu-ray licensees

The partners expect a license to cost **USD\$9.50** for a read-only Blu-ray device and \$14 for a burner. Discs will cost 11 cents for read-only discs, 12 cents for write-once BD-Rs and 15 cents for rewritable BD-RE discs. The creation of the one-stop is designed to avoid the problem DVD player manufacturers faced of having to negotiate deals with three separate organizations representing various patent holders⁹

Guidelines of Licensing DVD Copy control, DVD Copy Control Association,
<http://www.dvdcca.org/css/>

Advanced access content system, Association for copy protection on Blu-ray discs
<http://www.aacsla.com/specifications/>

7.3 Overview of Suppliers connected media devices

<i>Silicon – Media Processing and System on Chip</i>
Broadcom 35xx and 74xx series
Intel CE 3100
Mediatek MT5xxx, MT8xxx, and MT13xx
Micronas
NXP 225 and TV550
Sigma Designs 86xx series
STMicroelectronics STi71xx
Complementors and suppliers
Netflix to xbox
Mymoives meata data application
Non-connected consumer electronics
Dvd palyer, Blu-ray palyer

Devices that have two or more functions put into one box
<ul style="list-style-type: none">• NAS drives, with built in communication and computer functions and storage
<ul style="list-style-type: none">• Tivo/roku/blobbox/WD tv/ popcorn players
<ul style="list-style-type: none">• Xbox 360/PS3/Wii Movie players/game console etc.
<ul style="list-style-type: none">• HTPC, Living room pc , movie player, pc etc. bit torrent downloads
<ul style="list-style-type: none">• Apple TV, movies player, TV player

7.4 Company Interviews

Interview with Sigma Designs

Interview with Sigma Designs, (January 13, 2009) Investor call Full Transcript from the investor meeting; 01312009 can be found at

[Sigma Designs, Inc. F4Q09 \(Qtr End 01/31/09\) Earnings Call Transcript -- Seeking Alpha](#)

Ken Lowe

*Next is digital media adapter market for which Sigma has enjoyed a dominant position while the market interest develops. Recent events have increased the appeal of this market and we are now **expecting increased contributions** over the next several quarters. The driving force behind this change is linked to mobilizing your video library, somewhat again to the iPod concept. If you break down the iPod demand, you would find the two facets of appeal. First, it is a convenient mobile device for playing music and second it is a repository for accessing your entire music library, whether that access has playback on the iPod or in your home stereo or in a car. The new digital media adapter market is tapping into the second facet of appeal as it relates to your media library, and we are hopeful it will continue this growth and become a long-term revenue stream.*

Interview with Linksys/KISS Technology Transcript

Hey Erling,

I am currently writing a thesis regarding the digital convergence in consumer electronics market. Basically the driving force behind the convergence is that; Everything from a laptop to a mobile phone to a television to a games console is now, arguably, the same kind of device: each consists of a microprocessor, a screen, some storage, an input device and a network connection. All these devices will be able to record, play and stream digital information.

I am investigating how companies can make smart investment based on their evolutionary trajectory of their industry. Secondly, the thesis builds upon the evolutionary trajectories and how companies can use partnerships and standards or other investment alternatives to follow/lead the changes happening in their industry or in the new converging industry.

The argument in the thesis is that the main players in the new converging industry will come from these Industries.

Digital Transfer

ISP's Satellite, cable, Telco's

Digital Content

Content providers of premium paid/non-paid content, such as major TV channels, movie studios, Music, Games, Internet community created media (i.e. Youtube, I-radio)

Digital Platforms

- I.e. K.I.S.S./Cisco/linksys devices
- Intel Viiv/AMD Live
- Integrated settop boxes/cable/satellite solutions
- Tivo/DVR devices
- Apple FrontRow
- MS Media center/Xbox/Zune

The input from you and how you as an representative from K.I.S.S./Cisco would be valuable primary data to my thesis.

Q: What was your position at K.I.S.S. Technology?

A; Responsible for HW development and Manufacturing and in periods also for SW development

Q: What did you primarily work with at K.I.S.S./Cisco

A; DVD players, Hard disk recorders, DVD receivers, LCD and Plasma TV , Set-top boxes for T-online, Vista mediaextenders

Q: Can you briefly explain K.I.S.S. primary product's and what they can help you as a consumer do?

A; It enables the consumer to watch digital copies of movies and videos in their living room

Partnerships for standards creation

Q: Do you consider it important for K.I.S.S. to have partnerships and alliances with companies outside the electronic industry? If yes, why?

A; Yes , it is important for Linksys to part of the standard setting alinces that form the new digital format and technologies.

Q: Do K.I.S.S. have any partnerships/alliance with other companies such as content providers, Telco's ISPs, Cable satellite providers?
(i.e co-marketing, bundled sales or more strategic partnerships, i.e. K.I.S.S. produced set-top boxes for Calbe/Sat providers)

A; We have participated in the DLNA alliance

Q: In your opinion what was the reason Cisco/Linksys acquired K.I.S.S.?

A; KiSS has demonstrated that it was possible to utilize content from the internet and play back this content on a DVD player with an Ethernet connection, whit out using a PC as a gateway. KiSS had and has an online website with content like Web radio channels, EPG for TV channels, Weather forecast and simple games

KiSS had, at the time of takeover, the largest installed base of DVD players in the market (DP500 and DP1500) with enabled Ethernet / internet access..

Q: Could one of the reasons maybe be a fast way to gain access into the consumer electronic space, where Cisco as a network producer with primarily access to business segments?

A; Cisco/Linksys wanted to go into the market of integrating consumer products and their functionalities over the network in the home, and also enable access to Content from the Internet. This is considered a market with high growth potential and KiSS was selected as the best positioned company out of a total of 28 companies' world wide.

Q, Did you see Kiss holding technology in hardware design and or software design that Cisco did not hold themselves at the time of takeover?

A; Cisco is not developing Consumer electronics at all, and Linksys was/ is primarily an ODM company within network products like router and switches. Therefore they had no HW or SW experience within this field.

Q: What mediachip was the Kiss DP series build on? What OS was the Kiss hardware built on a small Linux variant?

A; Sigma Design. 85xx and 86xx series of ARM based chipsets running Linux

