

CASE STUDY TEACHING NOTE¹
THE BATTLE FOR CRITICAL MASS
IN THE UK MOBILE COMMUNICATIONS INDUSTRY

1. OVERVIEW, OBJECTIVES AND ASSIGNMENTS

1.1 Case Overview and Description

This case outlines the growth of the UK mobile communications industry from its inception, and provides an overview of the events that transformed mobile telephony into a mass market commodity. Beginning in 1985, the case outlines the continuous evolution of T-Mobile, Orange, Vodafone and O2², the mobile network operators (MNOs) which were licensed to operate in the UK from 1985 to date. The case describes how Orange and T-Mobile rapidly gained market share over O2 and Vodafone, the industries incumbents that had set up ten years earlier.

The case tracks the network operator's initiatives into the mid 1990s as the market changed radically in terms of affordability, product choice, and customer cohorts. Finally the case describes strategic action in the late 1990s when the MNOs experienced exponential demand and the market hit critical mass.

The case focuses on the strong forces affecting the companies: rapid technological developments and the exponential rise in sales fuelled by the mechanism of network externalities. Besides describing the sales patterns of the mobile communications market, the case documents the jockeying for the leadership position, and the constant narrowing of the differences in market shares. The companies experienced powerful market forces which override strategic action and permit new entrants to rapidly gain ground. As a result the MNOs opted for copycat strategies in order to collectively benefit from network externalities, and to reduce the risk of allowing competitors to gain ground.

When used with the support readings on the mechanism of network externalities, the case becomes a powerful vehicle for studying a variety of new market issues including strategic herding and strategic collaboration.

1.2 Teaching Objectives

The case can be introduced for different levels in a variety of courses including business strategy, leadership, management and marketing strategy. The student's understanding of the dynamics of network industries, will determine the level of the discussion in class. Thorough knowledge of the field is not expected. The case study works well as the basis for discussion of an industry in constant flux.

¹ This note was prepared by Tanya Sammut-Bonnici for the purpose of assisting case study instructors when using: "The Battle for Critical Mass in the UK Mobile Communications Industry" and published in the text book 'Strategy: Analysis and Practice' by John McGee, Howard Thomas and David Wilson. It presents teaching themes and questions that aim to develop students' understanding of strategic issues in an interconnected business environment and to promote classroom discussion.

² T-Mobile was previously branded as One 2 One. O2's earlier brand name was Cellnet, which was a subsidiary of British Telecom, the UK fixed line operator.

The case works best with a lecture on the dynamics of network industries as a new and important strategic reality. Strategic management may need a new tack to harness changes in the market landscape as consumers, network platforms, and technologies interact. (The slides for the introductory lecture are attached at the end of the teaching note). In the lecture I describe the concepts of network externalities, critical mass, open versus closed platforms, lock-in, versioning of standards, expectations management, and collaborative strategies. The following teaching themes may be emphasized:

- The role of network externalities in shaping demand patterns.
- The effect of critical mass on the industry's infrastructure.
- The role of strategy in managing these two powerful forces.

1.3 Case Discussion Questions

Discussion questions will differ according to the teaching objectives. This teaching note aims to emphasise the role of market forces and the industry's strategies.

The following assignment questions work well to set the framework of discussion:

1. How did leadership positions change over time?
2. Why do the MNOs market shares become similar?
3. How did the industry restructure its distribution after critical mass was reached?
4. What were the causes and incentives for the MNOs to engage in copy-cat strategies?
5. How can mobile networks implement network strategies to penetrate internet and entertainment networks?

1.4 Readings and Support Material

This teaching note highlights the findings of a longitudinal research project covering 20 years of the mobile phone industry conducted by Tanya Sammut-Bonnici, Robin Wensley and John McGee. The research and the dynamics of networks are referred to in detail in Chapter 12 of:

McGee J., Thomas H., Wilson D. (Eds.), *Strategy: Analysis and Practice*, Maidenhead: McGraw-Hill, UK, 2005.

Supplementary material that may be useful for lecturing material:

Shapiro C., Varian H. R., *Information Rules: A Strategic Guide to the Network Economy*. Boston: Harvard Business School, 1999.

Sammut-Bonnici, T., Wensley R., McGee J., *The Role of Network Externalities in Interconnected Industries: A Mobile Communications Case Study*. Academy of Management Conference, New Orleans, USA, 2004.

Sammut-Bonnici T., McGee J., *Complex Adaptive Systems in the Information Economy - The Mobile Communications Industry*. European Group for Organisational Studies, Berlin, 2005.

The discussion of the case will be greatly improved with more recent data on the market share trends in the industry, which corroborate the findings on network effects and consumer demand trends. The relevant graphs are attached at the end of the teaching note.

2. CASE TEACHING FRAMEWORK

The case is presented as a series of snapshots of the mobile phone industry over two decades. It is designed to capture the rapid evolution of the market during fast technological change.

When using the case in class I have found that a discussion plan that follows the sequence of the case helps the students grasp the scale of the market forces in network industries, and provides insight into the MNOs' own learning process. The case is backed by abundant and detailed material on network industries and the challenge lies in reducing its complexity to a few key points. The slides at the end of this teaching note are designed to crystallise the main teaching themes.

Another aspect worth noting is that students identify with the mobile phone industry which leads to a dynamic discussion of the case.

To introduce the case, I usually mention that the research community and the media have been following the progress of mobile telecommunications since the early 1980s and that there are several books and reports on the industry. I show that I recognise that the students are familiar with the industry and that their perspectives of it will be influenced by their experience as mobile users. An important point to make at this point is that although media coverage of the mobile industry is intense, it lacks important background detail of the special market dynamics of network industries (telephone, internet, software, hardware industries) which are propelled by the force of network externalities.

The task for the class is twofold:

1. To analyse the market mechanism of the mobile communications industry as a network market.
2. To identify that because of network externalities, network industries face different strategic challenges from non-network consumer products, such as foods, beverages, vehicles and real estate.

The industry has been undoubtedly successful in adding value, providing new services, creating jobs and pushing the limits of technological innovation. In 2004 mobile voice and data revenues reached £12.3 billion per year overtaking fixed-line voice revenues for the first time.

The following set of themes and questions can be used to lead the discussion.

2.1 Switching of Leadership Roles

“Let us track when Orange, T-Mobile, O2 and Vodafone gained or lost their industry leadership in the last two decades. Why did the incumbents lose their positions in the market? How did the newcomers rise rapidly to leading positions?”

The UK mobile industry's history challenges the idea of 'first mover advantage'. Vodafone and O2 held their market positions at a stable level, until the entry of T-Mobile and Orange in 1993 and 1994. At that point the market share of the older companies diminished as the new companies rapidly increased their hold on the market. Vodafone is seen to have held the longest lead, from 1986 to 2001. Orange and T-Mobile's meteoric rise are equally significant.

Market share leadership changed several times during the industry's history. O2, Vodafone, and Orange became industry leaders in 1985, 1986 and 2001 respectively. T-Mobile rose to first position in 2004. O2 lost its leadership position to Vodafone in 1985 when it went through three pricing changes. At the time, it was neglecting potential growth in the provincial areas where its pricing structure was more expensive than that of Vodafone. Orange managed to rise quickly above T-Mobile's market share by launching its network on a much larger installed base. Orange covered 50% of the population while T-Mobile covered only 30% at the launch date. Orange continued to grow overtaking O2 and Vodafone, by entering the younger age groups earlier than competitors, with more innovative products.

The industry shows evidence of shifting patterns of leadership. Orange's market share grew dramatically to first position in 2001. T-Mobile shot up to first place in 2004. The last two entrants in the market are the current market leaders and provide a formidable exception to the concept of first mover advantage.

2.2 Market Share Similarity

“Figure 4 in the case study shows the significant similarity in the market shares of, T-Mobile, Orange, Vodafone and O2. Why doesn't a winner-takes-all scenario occur?”

Network externalities are the ubiquitous force behind winner-takes-all scenarios where only the strongest firms survive. The market rewards high sales performance, which in turn creates more sales as customers draw in more customers. The effect is evident in cases such as Microsoft's quasi-monopoly and eBay's dominance of the consumer and small business auctions market. Interestingly however although the mobile phone industry exhibits strong network externalities, it does not have a dominant firm and the competitive environment is preserved. The case study indicates the presence of adaptive behaviour between competing firms. Strategies are reconfigured to ensure the collective survival of all operators in the industry. The probability that one firm will dominate and that the rest will fail is eliminated. A complex set of isomorphic strategies emerges at the levels of network platforms, technical standards, and consumer demand. Through strategic herding, network externalities are exploited to act for the benefit of the whole industry causing competitors' market shares to converge dramatically to equal levels.

The three factors that induce the companies to enact similar strategies are summarized below (see Fig. 1):

1. Interconnectivity in Network and Industry Structure (Fig. 2).
2. Technology Trends (Fig. 3).
3. Regulation (Fig. 4).

Interconnectivity in Network and Industry Structure: We have seen that market shares in the UK mobile industry tend to converge as customers draw others into their own mobile network as well as into other networks. The networks are all interconnected and compatible and there is no visible difference in connectivity among mobile networks. The mechanism of network externalities created by a new customer on one network will increase the likelihood of other customers subscribing to any of the networks.

The interconnectivity of mobile networks has a balancing effect on market shares. Technical network interconnection and revenue interdependence make it easier to affect copy-cat strategies which in turn encourage market shares to become similar.

The initial objective of the regulator some twenty years ago was to create a communications network which had immediate access to the fixed line platform, and access to other mobile networks. The utility of the new mobile platforms was thus established early on, even when the number of mobile users was low. In a sense the mutual objective of the industry's pioneers was to establish network externalities from the fixed installed base and to benefit from the growth of competing networks. The outcome of the objective was mutually beneficial.

Interconnectivity in mobile communications hinges on two important factors: the interconnections in the networks and the sharing of call revenue. The original objective of operating an open platform determined the survival of all the competing mobile platforms, which could evolve from one generation of transmission standards to the next in a concerted effort. Call revenue sharing ensured that the interconnectivity was kept at a high level of reliability across all the networks, in order to preserve revenue streams.

Interconnectivity leads to the concept of collaboration and 'co-evolution'. Evolving to meet the needs of other members in the value chain, is becoming a more effective strategy than satisfying the company's own needs. Adapting to meet other companies' needs leads to more business. Riding the new wave of co-evolution, companies are avoiding costly races against each other, in favour of a strategy of joining forces to gain more customers. NEC and Siemens, for example, joined forces to supply the networks for Hutchison 3G.³

Co-evolution and collaboration are even more relevant in industries where network externalities are a vital part of corporate success. The more customers join a network, such as a telecommunications service, the higher is the incentive for even more customers to join. This effect is causing companies to collaborate on issues of compatibility. With 3G mobile phones on the rise in Europe and the US, the setting of standards for a mobile Internet operating system is underway. Microsoft, Linux, Symbian and Openwave are competing to establish their technologies as the de facto standard.

Technology Trends:

Technology standards determine the course of development of the industry. The evolution from analogue to digital to third generation technologies was a co-ordinated strategy orchestrated at a global level. The process was initiated by the R&D companies that created the new technologies, and by the consortia that turned the technologies into standards.

The myriad of ICT⁴ standards necessitates a co-ordinated strategy for the management of the introduction of new technologies. The process has to be orchestrated on a global level, as networks have to remain seamlessly interconnected in spite of radical changes in transmission standards. Negotiated standardisation became widespread. Negotiated standards setting guarantee the smooth interchange of information, and the compatibility of technical components. The telecommunications industry was able to keep up with the speed of technological development by opening up negotiations to market players. The current mobile technology of GSM in Europe is synonymous with an association of 600 network operators and suppliers of the mobile phone industry. GSM is the de facto standard for Europe and Asia, but CDMA (code division multiple access) is preferred in the US. CDMA is a military technology first used during World War II. The UMTS Forum (Universal Mobile Telecommunications System) is a similar association, developed to speed convergence between telecommunications, media and content suppliers for the 3G industry. As with GSM the name of the UMTS association is synonymous with the name for the industry technology standard.

The Internet has a different history of standardisation to telecommunications. Standards were completely open and established by the research community. As the Internet has become a commodity for the domestic and the commercial communities, other players are increasingly influencing its evolution.

³ Hutchison 3G is a network provider of third generation telecommunications in Europe. It launched its service in the UK in March 2003.

⁴ Information and Communications Technologies.

The greater the extent to which technologies are uncertain, the greater the rate of isomorphic change (DiMaggio, Powell, 1983)⁵. This dynamic is seen in the choice of similar standards as well as the similar timing of the introduction of new standards. New technologies in mobile industries are typically introduced nationwide within the same time frame. The isomorphic policy to encourage concurrent launches reduces the risk of technological adoption deviation and ensures that competitors remain within similar performance levels.

Regulation: The regulation of the UK MNOs of mobile networks has a balancing effect on how the mobile networks develop. Regulation puts pressure on the firms to conform to legislation (and to become more similar), which makes regulation another important source of isomorphism and market share convergence. Regulation plays an important role at the inception stage of the industry, and at the early stages of new technology standards. Through spectrum licensing, regulation has the power to determine which companies enter the market. This occurred when O2 and Vodafone were licensed in the early 1980s, when T-Mobile and Orange were allowed to enter the market a decade later, and when spectrum auctioning was introduced in 2000. The auctions led to the licensing of the existing MNOs and the entry of Hutchinson 3G to operate the next generation of standards which include video streaming.

2.3 The Effect of Critical Mass

“The industry’s sales rose rapidly in the late 1990s to reach critical mass. What were the critical events that accelerated the increase in sales? As demand increased exponentially what pressures were put on marketing strategy in terms of distribution? How did the industry adapt to the new level of demand?”

Critical mass is the most visible and dramatic force in the market’s history. It is a consequence of network externalities and a significant self-reinforcing mechanism in the UK mobile industry. The critical mass point is identified to have occurred between 1998 and 1999, leading to the acquisition of 80% of the total subscribers market in the next three years.

Toward the second half of the 1990s, the environment for the supply chain changed considerably. In 1996, the Vodafone Group was teaming up with retailers to launch a nationwide mobile phone card scheme for analogue phones and for digital services. The company’s objective was to accelerate sales growth. The Vodafone pre-paid package was aimed to sell phones with Top-Up packages of 25 pre-paid minutes to be used over 30 days costing £24.90. The number of new customers increased exponentially making way for new types of distributors to join the industry. The nature of pre-paid packages required a wider distribution chain. Superstore and high street shops were joining the pre-paid bandwagon. The new retailers were wide and varied in nature and included organisations such as the Post Office, Tesco, Sainsbury, Toys R Us, Marks and Spencer’s, and Boots. Since pre-paid telephone packages and airtime cards were all sold as stand-alone units, with no link to any subscription, there was none of the complex administration involved such as credit vetting, and billing. As a result, more shops were able to sell pre-paid packages off the shelf just like any other product. This encouraged an increasing range of retail outlets, such as supermarkets to offer telephones and airtime. The new entrants presented a considerable challenge for existing mobile telephone retailers because they no longer had the market to themselves. Small companies with four or five outlets were struggling to compete against giants such as Sainsbury’s and Tesco.

The Post Office started to sell Vodafone’s pre-paid cards in October 1996. This deal gave Vodafone instant access to over 18,000 post offices across the country, where customers could effectively purchase airtime before they actually consume it. The pre-paid top up service gave customers more control of their mobile phone costs and it was an ideal fit with the post office’s well-established bill payment activities. The Vodafone deal with the post office was soon replicated by the other network operators.

⁵ DiMaggio and Powell hypothesise that organisations become increasingly similar in the presence of resource centralization, dependency, goal ambiguity and technical uncertainty.

Service providers⁶ were seeking to increase their own outlets in response to the threat from high street shops and superstores. In 1999 Carphone Warehouse, the UK's largest independent mobile telephone retailer, acquired a chain of non-mobile retail outlets. Spurred by the pre-paid boom, it purchased Tandy, the high-street electrical chain. The company paid £10 million for Tandy's 270 stores, increasing its presence to 450 stores throughout the UK and raised its share of the retail market for mobile telephones from 12% to 16%. The move for Carphone Warehouse to buy more retail outlets was necessary to meet the demand for pre-paid phones. Several retailers suffered a shortage of stock when demand had exceeded supply. The combined reach of Carphone Warehouse and Tandy had 450 stores across the UK and another 139 in Europe, employing more than 3,000 people.

2.4 Copy-Cat Strategies

“The case study implies that Orange, Vodafone, T-Mobile and O2 engaged in copy-cat strategies. What are the benefits and limitations of such strategies?”

Copy-cat strategies, or isomorphic strategies, are a set of homogenous behaviours brought about by pressures from network interconnectivity, technology advancement and regulation. Interconnectivity encourages accommodating strategies because of infrastructure sharing, call revenue sharing and joint company ownership by the fixed line operators and MNOs. The speed of technological development required further co-ordination to determine the industry standards and to introduce new technologies such as GSM and 3G. Regulation is a powerful force causing isomorphism, because of pressures to conform in spectrum usage, price, infrastructure sharing, and numbering systems.

Strategies were remarkably similar, both in their nature and in the time frame in which they were implemented. Each time one of the firms attempted to implement an innovative or merely a different marketing tactic its competitors copied the move within a matter of weeks or months. Efforts towards strategic differentiation were met with a counter mechanism to reduce the risk of one competitor succeeding more than the others. Product lines, pricing policies, distribution strategies, and promotional activity were copied by the firms. This led to very low strategic differentiation between the network operators. The MNOs' adoption of similar products, services and pricing policies, makes the firms appear similar in the eyes of the consumer, hence market shares become similar.

Benefits: Risk Reduction. Isomorphic strategies has strong appeal because of its risk reduction properties, which ensures the survival of more firms in the industry. Risk is reduced in two ways:

1. Network externalities are exploited to act for the benefit of the whole industry. If the MNOs had dissimilar network platforms (for example Linux and Windows) there would be the risk that a winner-takes-all scenario emerges as one company moves ahead rapidly. However with similar networks, the network externalities from one new customer are transmitted to the other companies. A watershed effect kicks in as each MNO generates more customers for itself and for its competitors. This mechanism is one of the reasons why the mobile industry grew so rapidly.
2. Copy-cat strategies reflect a chaos-reducing mechanism that eliminates the risk of failure. They avoid missing out on other companies' successful strategies. They avoid creating risky new strategic approaches which may fail.

Limitations: Lack of Innovation / Effects on Competition. Innovation in the strategic process is limited and strategic action becomes more homogenous over time. The case study highlights a serious caveat of copy cat strategies: industry profit margins are likely to decline as shown in a study of the German mobile market. The reduction in strategic differentiation, created by the incumbent operators, was responsible for the

⁶ MNOs (T-Mobile, Orange, Vodafone and O2) provide the network infrastructure, whilst Service Providers act as retailers of the MNOs' airtime.

lost earnings, which amounted to more than £495 million in 1998 alone. As strategic differentiation and margins decline, companies anxiously endeavour to reintroduce differentiation from competitors, typically by expensive branding campaigns and higher marketing spending.

2.5 Future Strategies for an Interconnected World

“The mobile telephony platform is moving in on the internet platform and popular entertainment platforms. How can the network operators rapidly gain market share in these industries?”

The late comers in the mobile phone market managed to gain market share rapidly, competing successfully with the incumbents. Analysing how and why this happened give some pointers on how the mobile phone industry can penetrate other network platforms. We already see several mobile network providers such as Vodafone applying a strategy to position their products to appear similar to iPod, to digital cameras, and to internet ready PDAs. The key to the successful penetration of a new network is seamless compatibility. Microsoft applied such strategies when it rapidly took over the market established by WordPerfect and Lotus spreadsheet.

If there is sufficient time, the instructor may choose to conclude with the fundamental question facing the mobile industry:

“In this industry, is a company’s rise to market leadership dependent on its own strategies or is it purely a matter of chance fuelled by periodic effects in consumer demand? How can companies maintain their leadership position?”

3. CONCLUSION

There are several methods to conclude the discussion, depending on the module, the learning objectives within the course and the perspectives of the participants. Concluding comments can highlight that the telecommunication industry challenges the notion of competitive advantage and strategic differentiation. The industry is built around the same technological resources, which are in constant flux as scientific capabilities increase rapidly. The constant upgrading of technologies and standards creates uncertainty. The companies combat the uncertainty by herding together, by keeping their networks intrinsically similar and by copying any new strategies. The companies’ copy-cat strategies reflect a chaos-reducing mechanism that eliminates the risk of failure. Network externalities are exploited for the benefit of the whole industry and winner-takes-all scenarios such as those of Microsoft are avoided. Strategic herding implies that the firms create a single interdependent network, bound together by adaptive mechanism of evolving technology and strategy.

SUPPORT SLIDES FOR CASE DISCUSSION

Fig 1,2,3,4

Figure 1: The 3 forces causing Isomorphic (Copy-Cat) Strategies and Market Share Similarity

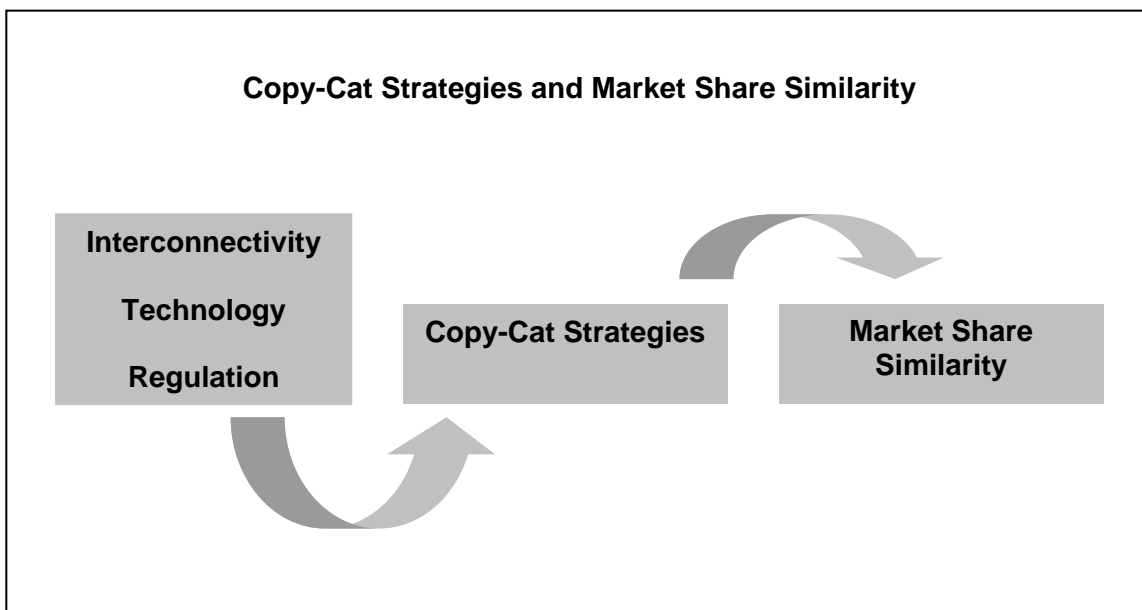


Figure 2: Interconnectivity as a Source of Isomorphic Behaviour

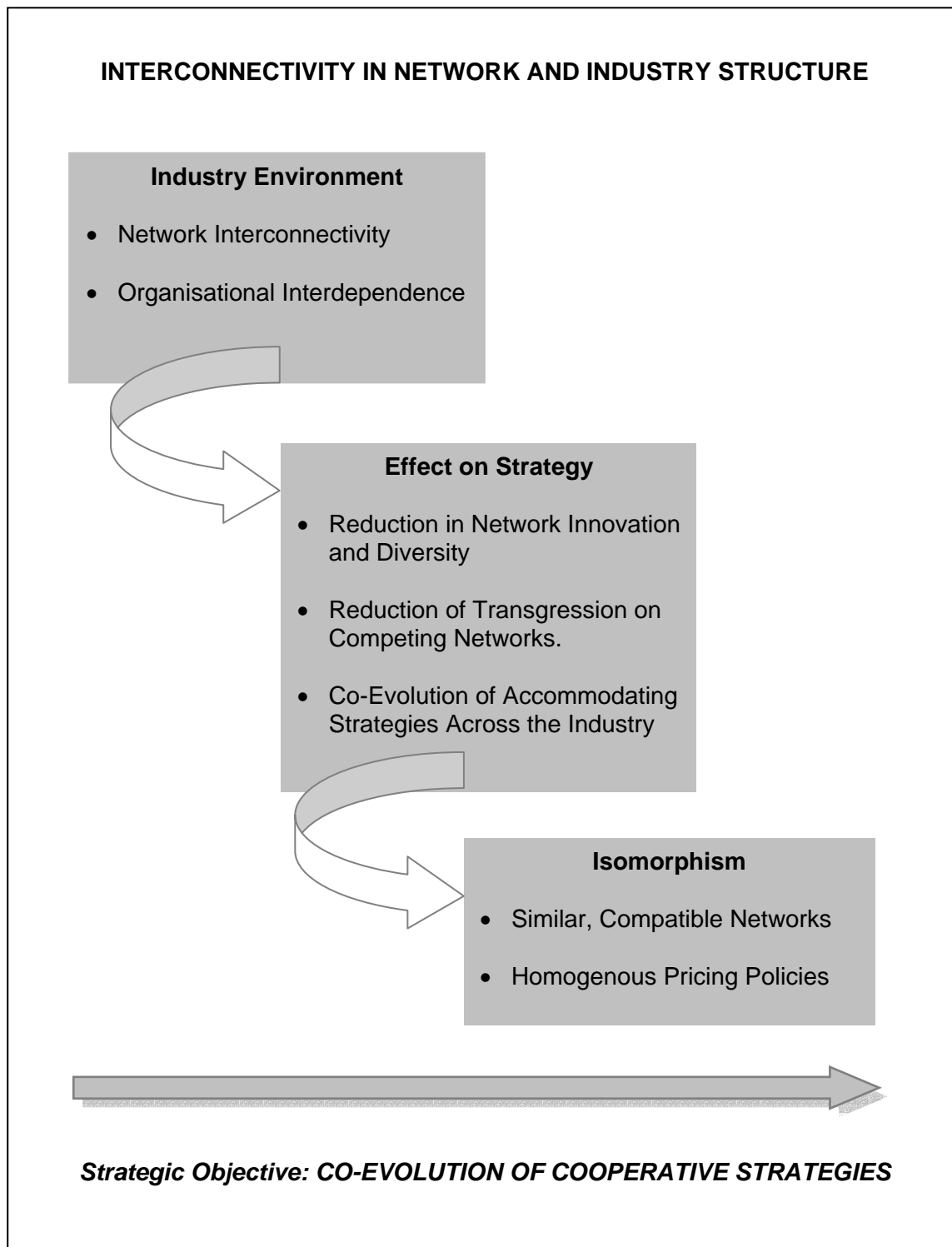
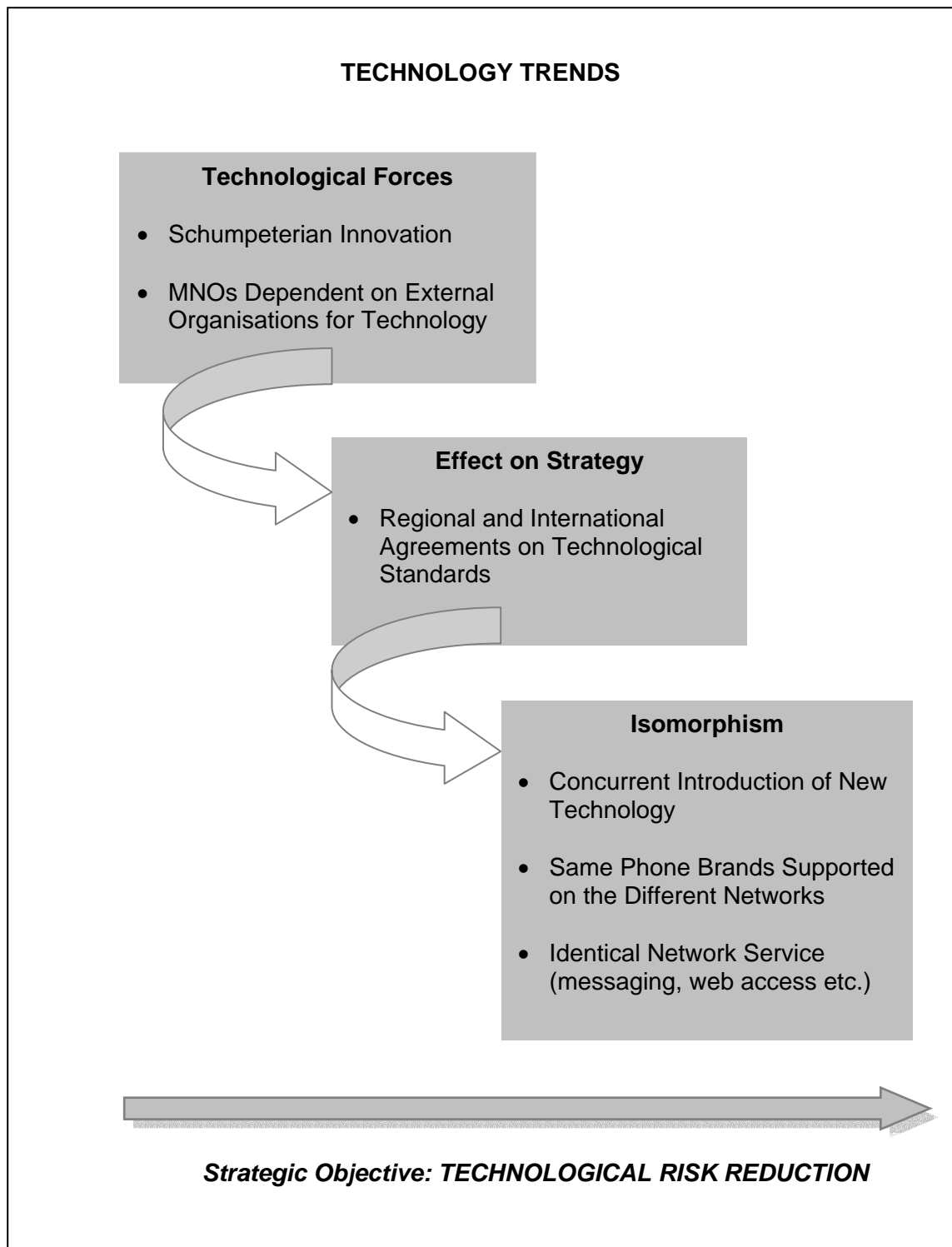


Figure 3: Technological Trends as Sources of Isomorphic Behaviour



REGULATION

REGULATION FACTORS

- Spectrum Licensing
- Price Control
- Infrastructure Sharing and Interconnectivity
- Numbering System

Effect on Strategy

- Preservation of Relationship with Regulatory Organisations

Isomorphism

- Compliant Behaviour regarding network interoperability, pricing, distribution and promotion
- Avoidance of Strategies which lead to dominant market power

Strategic Objective: REGULATORY COMPLIANCE

SUPPORT SLIDES FOR CASE DISCUSSION

Fig 1,2,3,4

Figure 1: The 3 forces causing Isomorphic (Copy-Cat) Strategies and Market Share Similarity

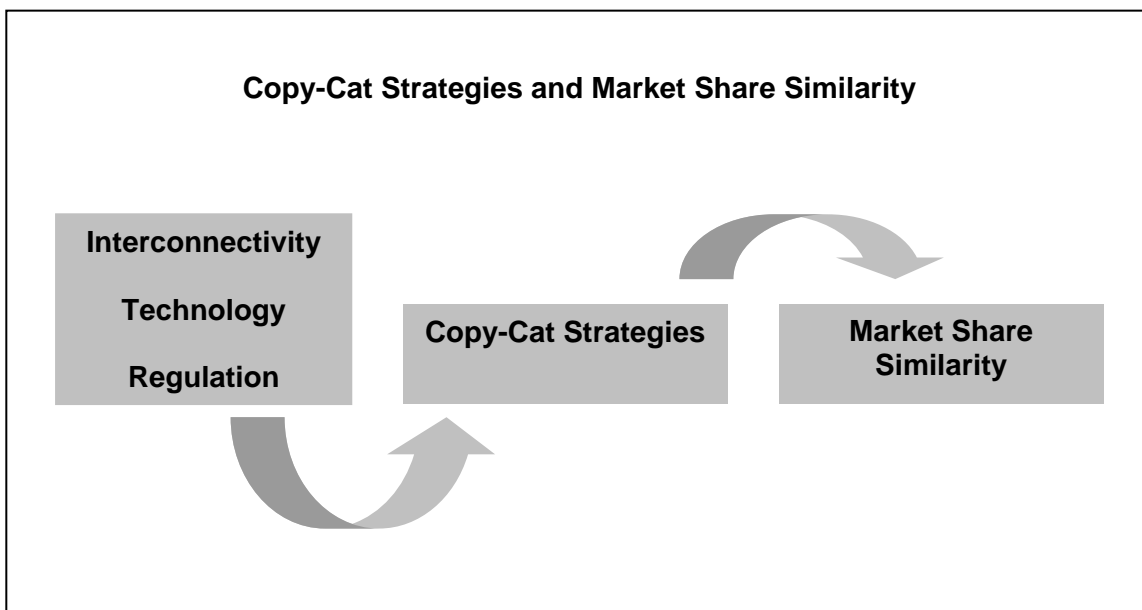


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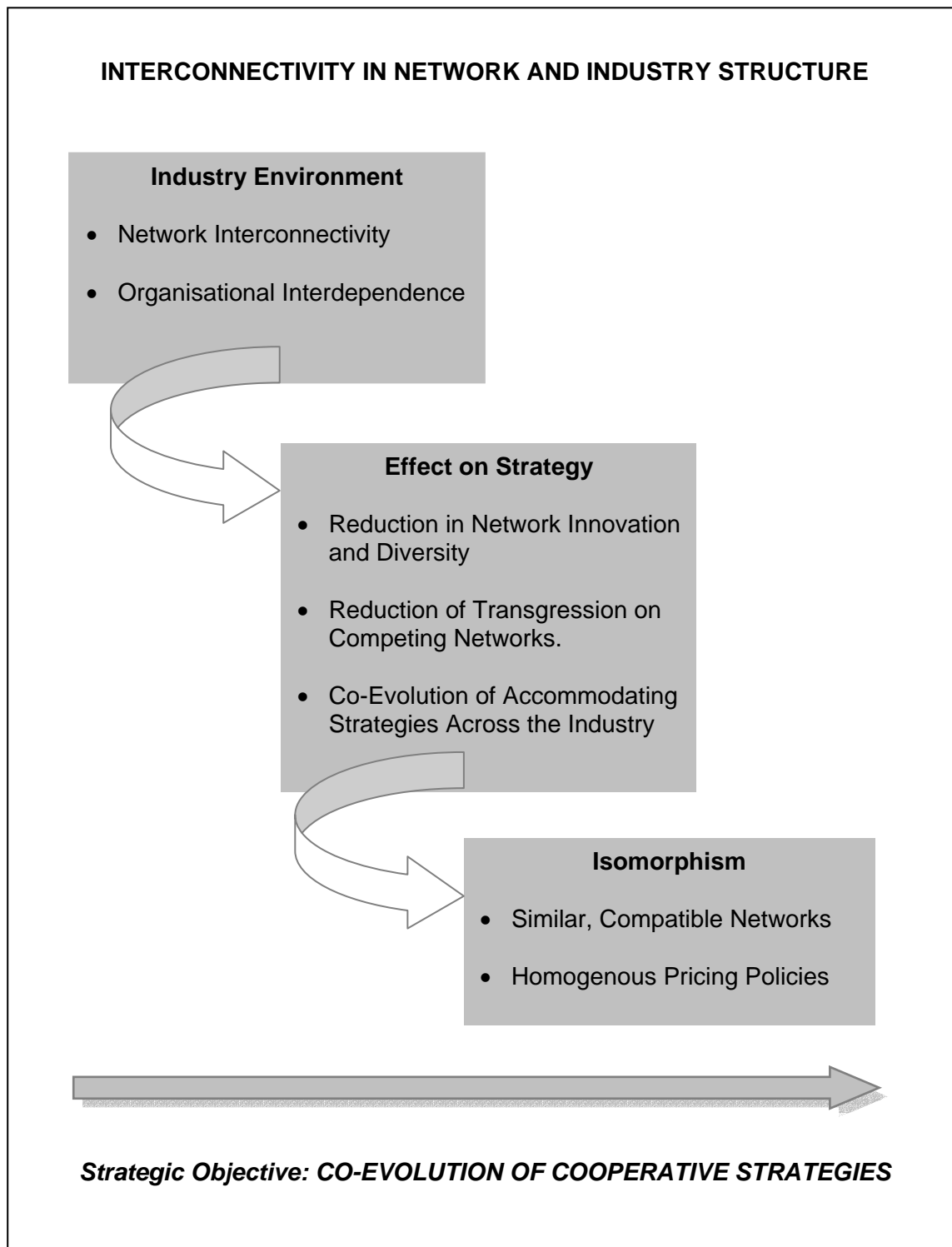
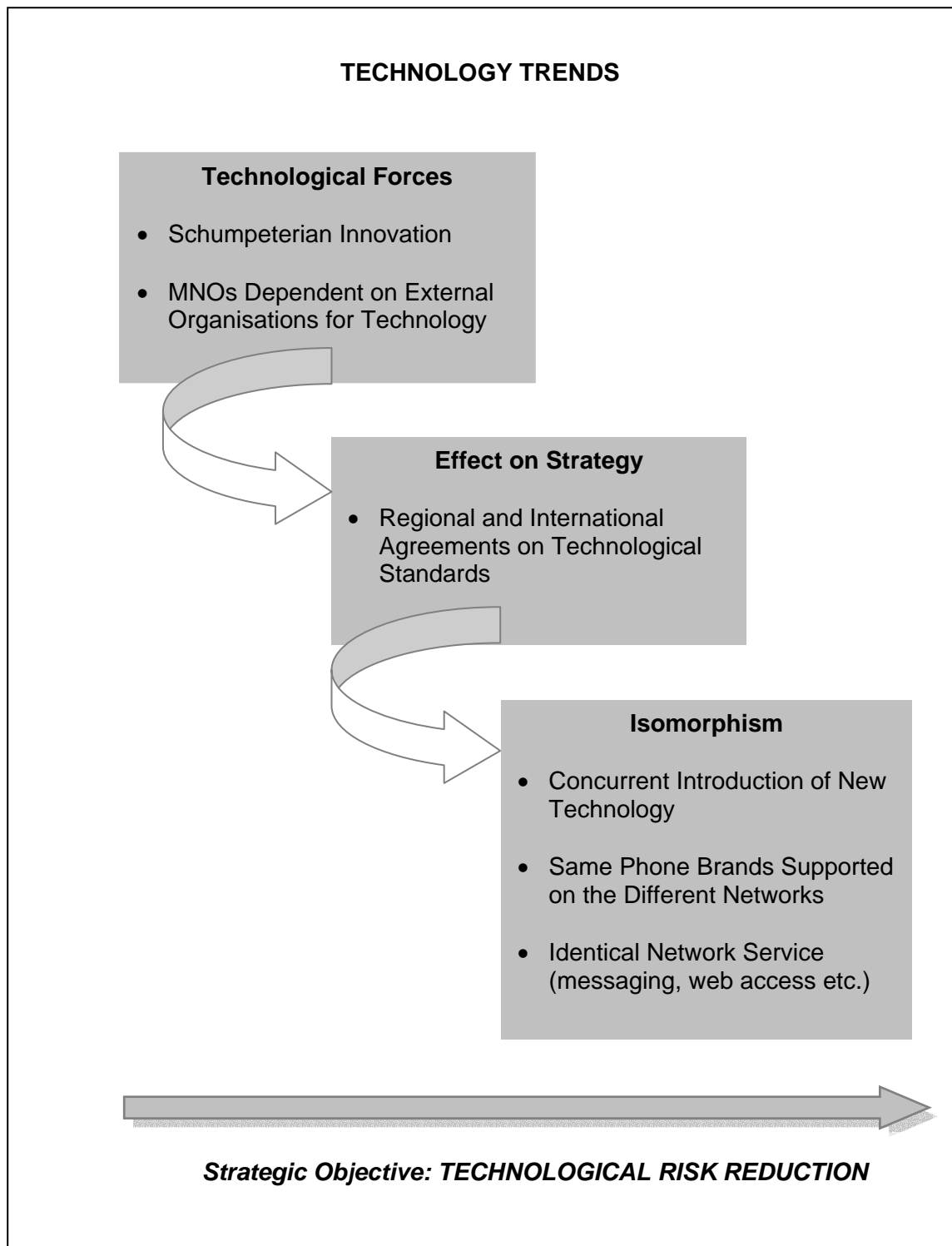


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Strategic Objective: REGULATORY COMPLIANCE



Winning the Battle for Critical Mass

In Search of Strategies for the Information Economy

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Critical Mass Strategies

Lecture Outline



1. Critical Mass Scenarios

Case: Rapid take off of Mobile Phones
Winner-Takes-All vs Collective Survival

2. Strategies to achieve Critical Mass

Open/Closed Platforms, Lock-In, Switching Costs,
Expectations Management, Versioning of Technology

3. To Win or Lose

In Search of Strategic Paradigms

1. Information Economy

Critical Mass

Fast Take-Off. 80% of UK Mobile business captured post 1999.

- **Network Effects**

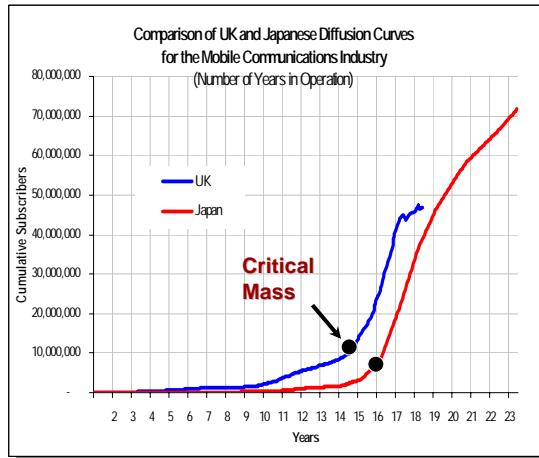
New users generate even more new users

- **Positive Feedback**

Desirability of the product increases exponentially

Metcalf: Square the People!

$$\text{Utility} = N(N-1) \text{ or } \sim N^2$$



1. Information Economy

Critical Mass

Scenario 1:

Winner-Takes-All

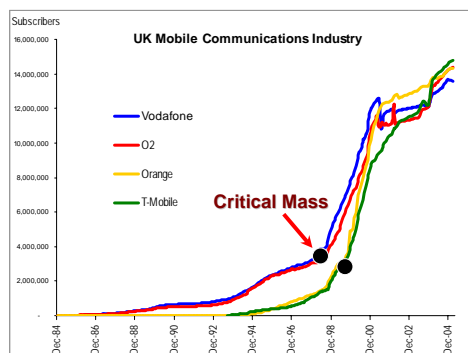
- Dominant Player
- Critical Mass Battle



Scenario 2:

Several Winners

- Several Winners
- Common Critical Mass



2. Critical Mass Strategies



Open vs Closed Platform

Microsoft & Linux, Mobile Roaming -SMS
Palm & Windows, iPod & Symbian

Lock In and Switching

Qwerty vs Dvorak, PC vs Mac, Wintel
Windows vs OS, MS Office Suite

Versioning of Standards

Intel: Pentium to Itanium
Etacs, GSM, CMDA
Windows versions

2. Critical Mass Strategies

Expectations Management

Customers join the Network which they
expect to become the largest.

“The Future is Bright the Future is Orange”



Collaborative Strategies

Building alliances for larger networks
Larger Network = Stronger Network Effects

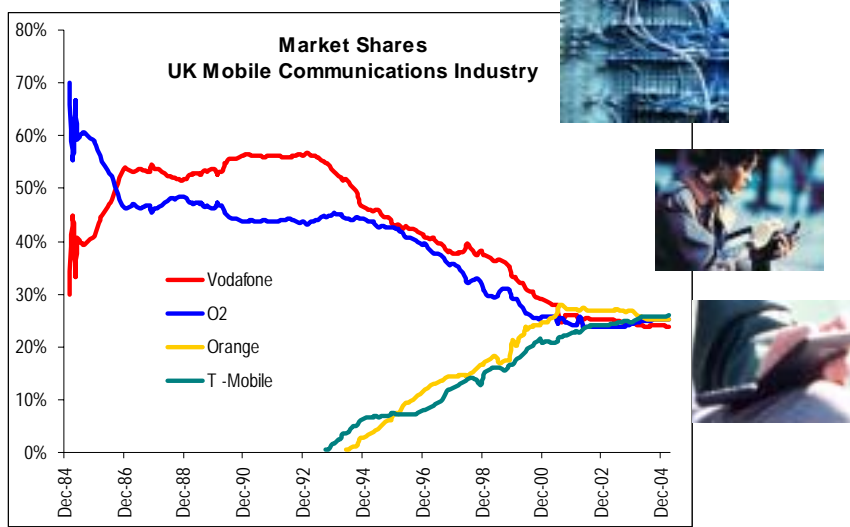


Copy Cat Strategies

Risk reduction, chaos reducing mechanism.

2. Critical Mass

Isomorphic (Copy Cat) Strategies

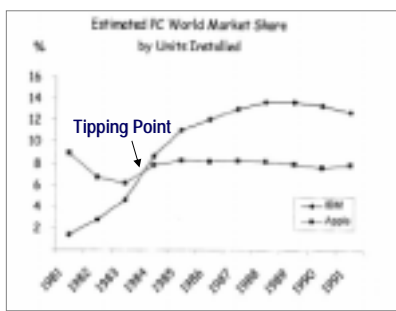


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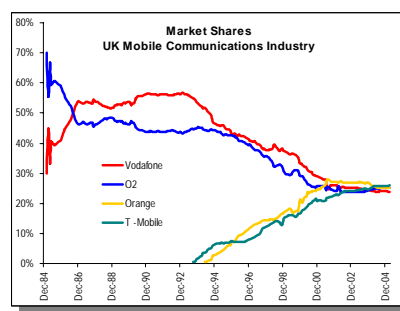
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2. Critical Mass

To Win or Lose



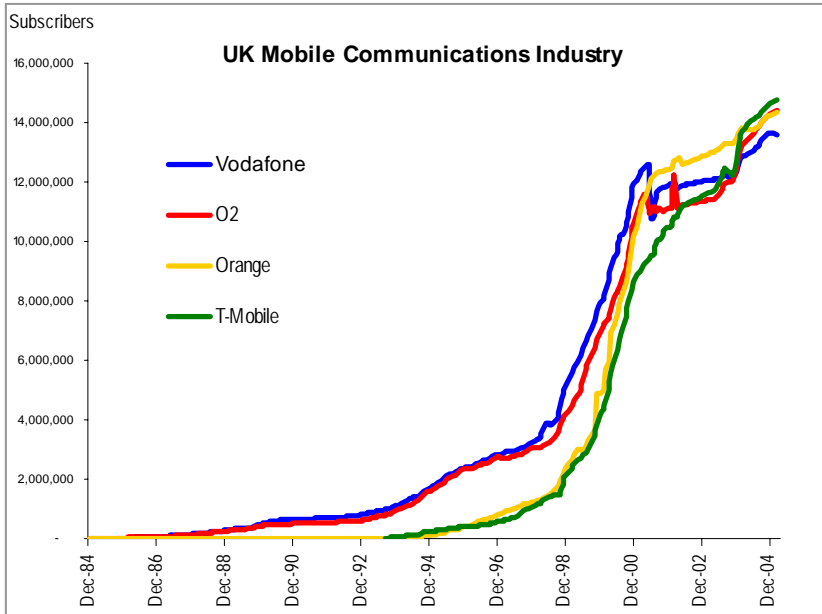
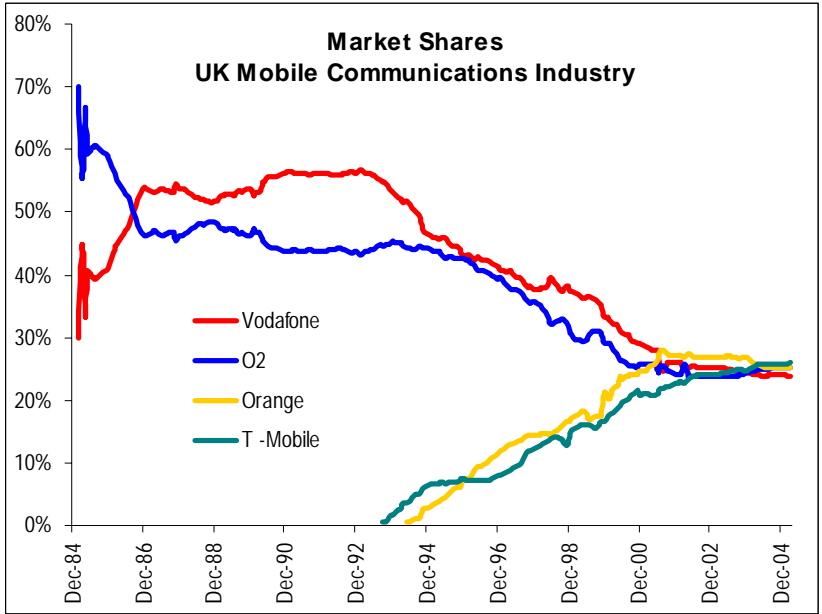
Higher Risk
(close platform)

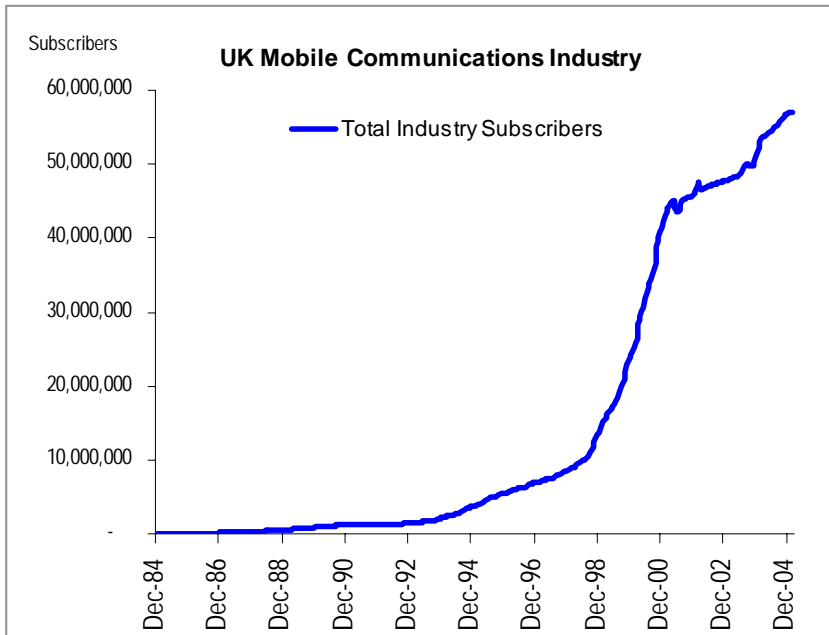


Lower Risk
(open platform)

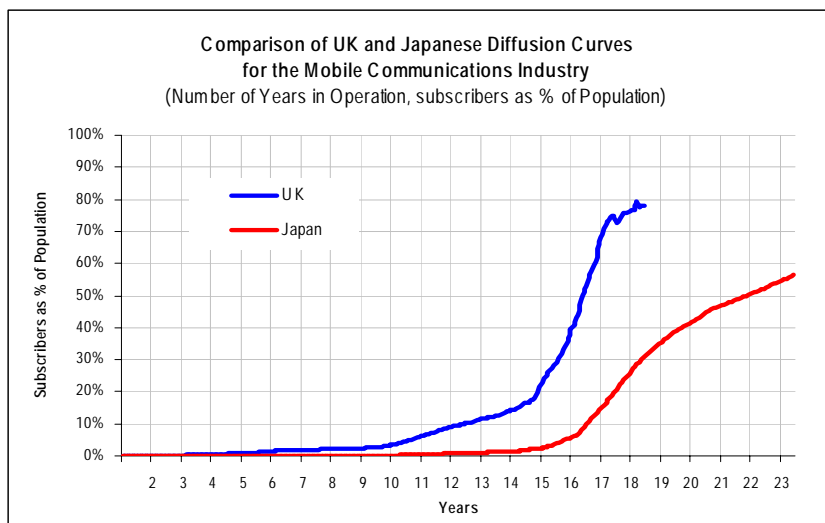
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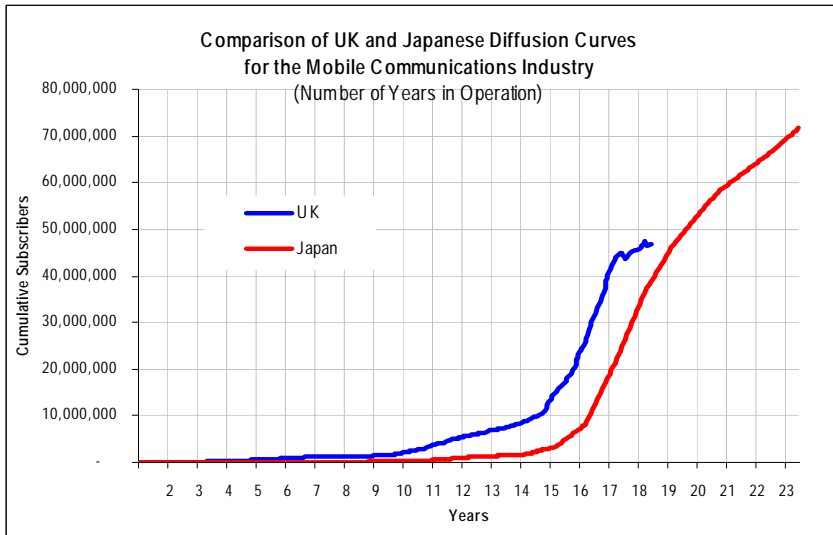




UK and Japan 3/3 Comparison Based on Years in Operation



UK and Japan 2/3 Comparison Based on Years in Operation



UK and Japan 1/3 Comparison Based on Calendar Years

