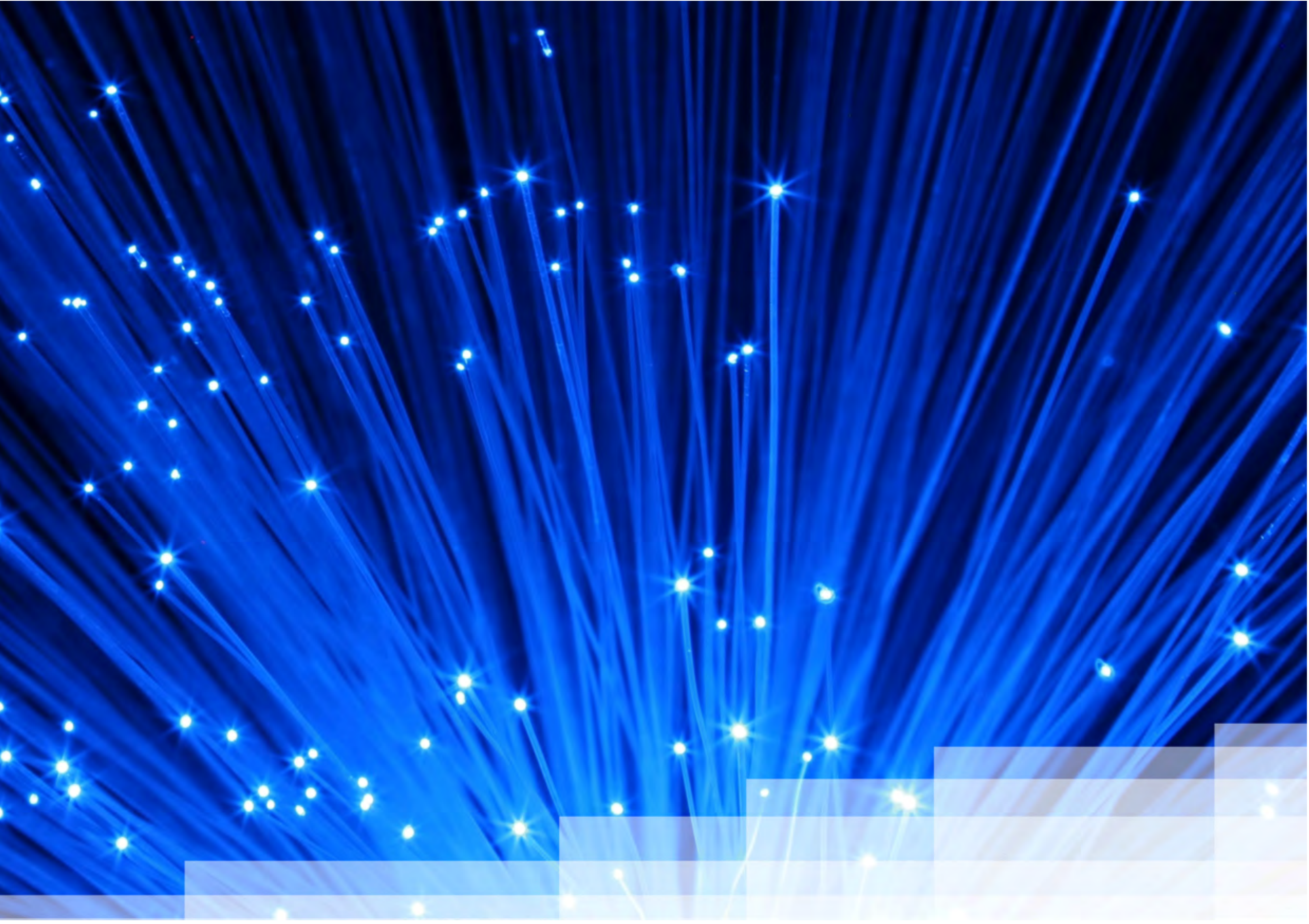

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FTTX-EXPERIENCES AND STRATEGIES

Filling the pipe of the NGN

INTRODUCTION

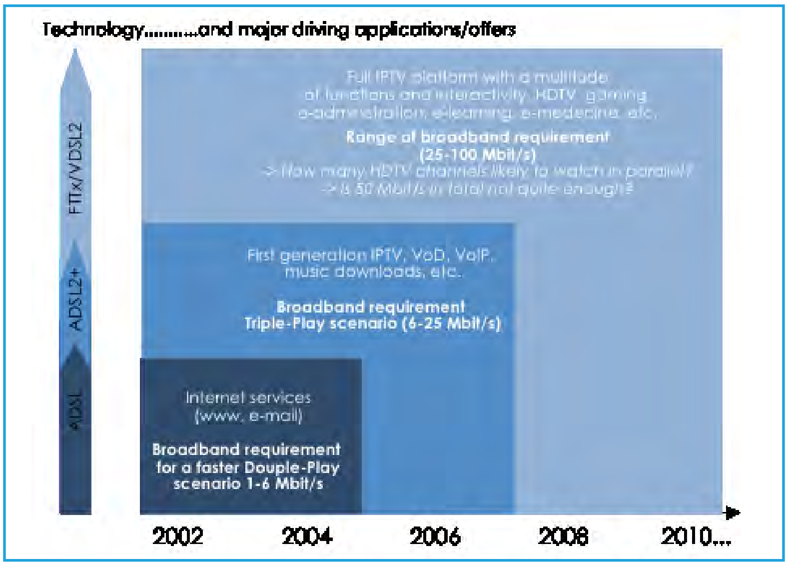
Starting in the 80ies and 90ies, fibre optic infrastructure has found its way in the telecom backbones and has been more and more used in the access network to connect large business accounts. Nowadays, many companies and governments in Europe, America and Asia are exploring the potentials of FTTx technologies for the consumer market. The discussions, on what specific decisions should be taken by whom and how high the risks are if a certain way is entered or not, often seem to have an emotional touch.

On the one hand side, no one — neither carrier, service provider nor government — wants to catapult himself into a future inconvenient situation by not recognizing innovative trends and by not taking the right investment decisions. On the other side, not every innovation is needed or has enough potential to fulfil the hopes as rapidly as wished — as proven by some UMTS frequency auctions.

Without existing or predicted killer applications, it is in general difficult to justify high investments into a new technology. It is a common fact that very high bandwidth consuming services do not yet really exist and that only a sum of simultaneously used services will "fill the pipes". Of course, the slowly arising HDTV is seen as a future high bandwidth consuming service. But future compression methods, competitive offers on alternative infrastructures or a lack of user interest might not justify a push towards FTTx.

Further aspects concerning bandwidth consuming video or TV services became evident in user inquiries or trials like the Dutch "Kenniswijk" programme: respecting legal rights of the content providers, price sensitivity of the users and profitability of the service.

A recent InfoCom report on IPTV offers has also shown that many TV services, e.g. within triple play offers by telecom carriers, are already realised via the existing copper infrastructure.



At present, Europe seems to be lagging behind Asia and America with the deployment of FTTx technologies. Especially Japan and South Korea are leading countries as regards the implementation of fibre optic technology in the access network. But should other carriers or governments, especially in Europe, follow blind and trustful these examples and push eagerly the FTTx deployment?

In fact, numerous different factors have an impact on the degree of FTTx development in each country. It is not even presumptuous saying that nationwide FTTx strategies are in some countries quite impossible and that separate strategies for every region or agglomeration have to be developed by each actor. Before starting to moan that one country or carrier is lagging behind a general trend, one should have a look on the diverse following aspects that have an influence on the profitability or the return on investment:

- National or regional subsidy programmes by authorities/governments or incumbents, including the regulation context or tax rebates; especially in Europe, the lack of precise regulation decision prevents some actors to go ahead;
- The general level of competition in the telecom and multimedia sector; this includes also the pricing level and existing service variety of competitive offers, e.g. triple play services by CaTV operators or the choice of free TV channels;
- The penetration of other broadband infrastructures and their future capacities (e.g. average length of local loop lines);
- All legal, socio-economic and environmental factors that have an impact on the network deployment costs, e.g. building/digging restrictions in towns, aerial versus buried fibre, employee costs, population density, number of multi-tenant dwellings, availability of empty ducts (including space in sewer systems), etc.;
- Socio-demographic and culture aspects such as the acceptance of new technologies or application, the ownership of dwellings/housing (e.g. finding agreements to install hardware on the customer premise), the standards of living etc.

Also, the type of the FTTx actor has an influence on the chosen strategy, business model and technology. Especially in Europe, a panoply of different actors has dived into the FTTx deployment going from housing companies, local interest groups, city councils, power utilities, ISPs, cable TV operators, city carriers to incumbents.

Taking into consideration that every FTTx strategy is or has to be based on a rather individual context, InfoCom's FTTx report will highlight business models and service approaches by leading European, Asian and American actors.

COUNTRY AND CARRIERS COVERAGE

Asia: Hong Kong, Japan, South Korea

Europe: Austria, Belgium, Denmark, France, Germany, Italy, Norway, Spain, Sweden, Switzerland, The Netherlands, UK

North America & others: USA and some other best practise candidates

QUESTIONS TO BE ANSWERED

- How is the regulation context concerning FTTx infrastructures and services? How much do subsidy or innovation programmes by national/local authorities or incumbents influence the FTTx deployment?
- Which types of actors invest in FTTx infrastructure? Which are the different business models of the major actors?
- What technologies and infrastructure solutions are preferred in the different countries and which are the reasons?
- What kind of services are offered on FTTx infrastructures? Where are the exclusive or innovative services? What are the differences to the service portfolio based on other fixed broadband infrastructures?
- How much bandwidth do today's services require? How will the bandwidth demand be in the near future? Which and where are the high bandwidth consuming killer applications?
- Which are alternative infrastructure solutions? Which is their today's penetration and will they respond to future needs?
- What are the investments and subscriber forecasts? What are the profitability forecasts?

WHO SHOULD BUY THIS REPORT?

- **Incumbents, alternative telcos and CATV carrier:**
  InfoCom´s report can be used as a benchmark tool and reference document for strategic planning such as identifying the opportunities and best practices for the improvement and development of new services; in addition, the report allows the identification of potential threats and the evaluation of possible alternatives to achieve future targets.

- **Regulators:**
  Evaluation of the impact on the overall telecom market with the introduction of these new applications & technologies (operator competition, new players arriving, etc.).

- **Manufacturers and TV-content provider:**
  Market overview as regards the current user demand and other benchmark aspects with regard to the most successful technologies in operation, the development of promising applications, technical limitations, etc.

- **Investors and analysts:**
  To understand the impact of these new technologies within the global market of ICT and what are the potential future scenarios in terms of users, revenues, etc.

TABLE OF CONTENTS

MARKET SCENARIOS

Market scenarios in separate market dashboards in excel format providing broadband market data with the following information breakdown:

- Number of ULL lines with breakdown between shared and fully unbundled lines;
- Number of fixed telephony subscribers with split between incumbent and others;
- Telephone services via CaTV networks with split between traditional and VoIP services;
- Number of CaTV subscribers;
- Number of broadband connections with breakdown according to technology type: cable modem, DSL, fibre optic and other broadband technologies (powerline, fixed wireless, satellite);
- Number of RGUs (Revenue generating units) with breakdown on telephony, TV and broadband Internet services;
- Total retail revenues and ARPU (Average revenue per user) for cable modem, DSL and fibre optic services;
- Penetration rates for cable modem, DSL and fibre optic services;
- Residential and business breakdown according to technology type: Cable modem, DSL and fibre optic;
- Number of Internet connections with breakdown between narrowband and broadband;
- Further split between residential and business Internet connections;
- More detailed indicators breakdown (e.g. VoIP subscribers) is also available on demand;
- Carrier coverage: Incumbent;
- Country coverage: Austria, Denmark, Finland, France, Germany, Italy, Japan, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, UK & USA.

Market scenarios in separate market dashboards in excel format providing television market data from 2004 to 2012 with the following breakdown:

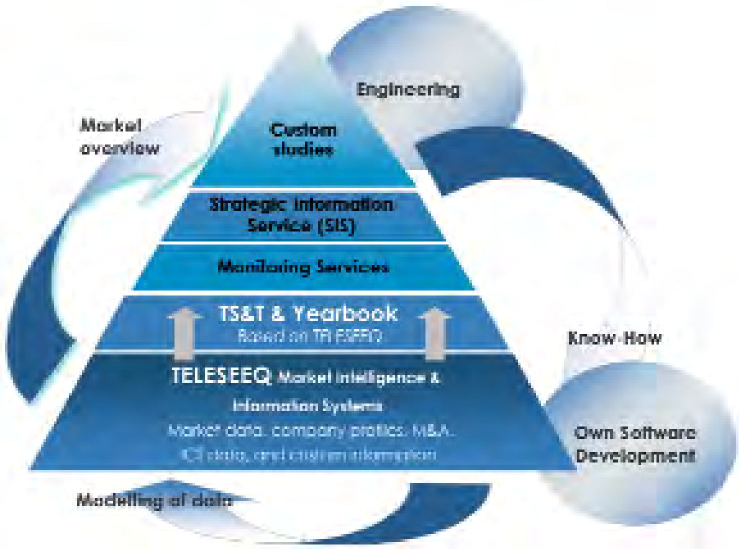
- Country data: Households;
- Total TV watchers: Split by CaTV, Satellite, IPTV and terrestrial TV access;
- % of TV watchers by access technology: CaTV, Satellite, IPTV and terrestrial TV access;
- Number of CaTV subscribers: Split by major cable companies;
- Market share of major cable companies;
- Number of satellite TV subscribers: Split by major satellite companies;
- Market share of major satellite companies;
- Number of IPTV TV subscribers: Split by major IPTV companies;
- Market share of major IPTV companies;
- Country coverage: Austria, Denmark, Finland, France, Germany, Italy, Japan, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, UK & USA.

METHODOLOGY

Our expertise consists of our ability to deliver an integrated solution to telecommunications, IT & multimedia market knowledge.

INFOCOM'S KNOWLEDGE FLOW

Strategy activities are supported by our permanent in-house information system known as Teleseeq. This information system provides our strategy analysts with valuable historic data and up-to-date information that they use to develop custom studies. Teleseeq is a closed, coherent and consistent system, which enables us to provide a realistic overview of the market and to support our in-depth analyses. The output of the custom projects feeds then in turn into Teleseeq by enriching it and fine-tuning the data.



At the same time our strategy activities are further enriched by our engineering expertise for business users — such as technology audits and consultancy for the implementation of ICT systems such as IP-PBX, messaging, call centres, LAN, etc. — including support for installation and maintenance —, while providing in return new know-how to the group. This process creates InfoCom's knowledge flow represented in the above chart.

SELECTED REFERENCES

Operators:
Belgacom, Botswana Telecom, Deutsche Telekom, France Telecom, KPN, Mobilkom Austria, Polkomtel, Swisscom, TDC, Tele2UTA, Telefónica, Ukranian Telecom, etc.

Regulator & Others:
Anacom, Citigroup Global Markets Inc., Communications Authority of Thailand, Enterprise Ireland, ETRI, European Commission, National Communications Authority of Hungary, The Boston Consulting Group, etc.

ABOUT INFOCOM

InfoCom is a market research and consultancy company with 20 years experience providing strategic analyses and planning assistance to stakeholders in the telecommunications, IT and multimedia industries. InfoCom's independent and fact-based analyses highlight trends and opportunities, supporting decision makers to understand market dynamics in order to improve their competitive advantage.

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- **IPTV landscape in Asia**
  The objective of the study is to give an overview on the different solutions & business models of the major programmes currently available for the deployment of IPTV in Asia.
- **VoIP consumer retail offers**
  This report provides information on the current VoIP offers in the majority of European countries. An overview on the VoIP market split into residential and business customers by incumbents, alternative carriers, ISPs or service providers — including their tariff structure — is given within the report.

FOR FURTHER INFORMATION

The Report FTTx-Experiences and Strategies is soon to be published. We will be happy to let you know more about the details of this report or advise you on related reports and services. InfoCom offers a comprehensive range of reports and information suite subscriptions that enhance your decision-making activities. For further information on this report and other services we provide, please contact us today:

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