Holistic approach for improving the FTTH business case

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Ghent University – IBBT

Cost605 Econ@tel meeting
Athens, Greece, Feb 17, 2010
Players are waiting for one another..
Essential steps

- Strategic geo-marketing
- Synergetic installation
- Detailed operational modeling
- Holistic view
Large amount of potential customers
General overview for Ghent

- Transport
- Industrial areas
- Commercial areas
- Residential areas
- Green belt
Target area input
Demographic data

Population density & area surface

<table>
<thead>
<tr>
<th>Deelgemeente</th>
<th>oppervlakte</th>
<th>Bevolkingsdichtheid</th>
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<tbody>
<tr>
<td>Afsnee</td>
<td>3.95 km²</td>
<td>359.49</td>
</tr>
<tr>
<td>Drongen</td>
<td>27.43 km²</td>
<td>447.54</td>
</tr>
<tr>
<td>Gent</td>
<td>70.34 km²</td>
<td>1667.94</td>
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<tr>
<td>Gentbrugge</td>
<td>7.86 km²</td>
<td>2550.25</td>
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<tr>
<td>Ledeberg</td>
<td>1.09 km²</td>
<td>7559.63</td>
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<tr>
<td>Mariakerke</td>
<td>5.20 km²</td>
<td>2246.15</td>
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<tr>
<td>Oostakker</td>
<td>10.47 km²</td>
<td>1195.80</td>
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<tr>
<td>Sint-Amandsberg</td>
<td>5.99 km²</td>
<td>3766.28</td>
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<tr>
<td>Sint-Denijs-Westrem</td>
<td>6.24 km²</td>
<td>832.53</td>
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<tr>
<td>Wondelgem</td>
<td>5.82 km²</td>
<td>2121.65</td>
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<tr>
<td>Zwijnaarde</td>
<td>12.04 km²</td>
<td>569.27</td>
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<tr>
<td><strong>Totaal</strong></td>
<td><strong>156.43 km²</strong></td>
<td><strong>1473.25</strong></td>
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Target area input
Demographic data
Market input
Bandwidth drivers

eGovernment
eEducation
eHealth
eBusiness
Leisure
<table>
<thead>
<tr>
<th>Technology input</th>
<th>€ /m</th>
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<tbody>
<tr>
<td><strong>Trenching</strong></td>
<td></td>
</tr>
<tr>
<td>+ Robust and invisible</td>
<td>40 - 60</td>
</tr>
<tr>
<td>- Expensive road works</td>
<td></td>
</tr>
<tr>
<td><strong>Blowing Fibre</strong></td>
<td></td>
</tr>
<tr>
<td>+ Cheap &amp; install when used</td>
<td>5 - 10</td>
</tr>
<tr>
<td>- Ducts available</td>
<td></td>
</tr>
<tr>
<td><strong>Aerial</strong></td>
<td></td>
</tr>
<tr>
<td>+ Fast &amp; cheap</td>
<td>7,5 - 15</td>
</tr>
<tr>
<td>- Vulnerable &amp; regulations</td>
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</tbody>
</table>
Focus on best customers

collect  classify  group
Essential steps

- strategic geo-marketing
- synergetic installation
- detailed operational modeling
- holistic view
Outside plant deployment
Deploy in synergy

Telecom Specific
- Services
- Infrastructure

passive infrastructure
- duct
- trench
- RoW

provisioned element

RoW

trench

duct

Infra.
Value Network Analysis

**Network Service and Application Provider**

**Utility companies**

**Infrastructure Provider**

Government intervention: NRAs (following EC)

Infrastr Prov

- Right of Way

**Planning**

- Network planning
- Rollout planning

**Deployment**

- InPlant – Content server
- InPlant – Application server
- InPlant – Network service equip.
- InPlant – Wavelength equip.

**Customer Migration**

- Customer side – Application equip.
- InPlant – Customer connection
- Cust. side – ONU

**Operations**

- Content
- Continuous costs
- OA&M
- CRM

**OutPlant**

- Trench
- Fiber
- Passive equip.
- FP
- Customer connection

**InPlant**

- Network service equip.
- Application server
- Customer connection
- ONU
- Wavelength equip.

**Utility companies**

**Network Service and Application Provider**

**Infrastructure Prov**
Essential steps

- strategic geo-marketing
- synergetic installation
- detailed operational modeling
- holistic view
Operate the joint infrastructure
Life cycle analysis for cost breakdown
Life cycle analysis applied to FTTH rollout
Life cycle analysis applied to FTTH rollout
Life cycle analysis applied to FTTH rollout
Life cycle analysis applied to FTTH rollout
Life cycle analysis applied to FTTH rollout
Cost classification in FTTH rollout model

- Planning Phase
- Energy
- FTTH Rollout Deployment Phase
- Migration Phase
- Operational Phase
- Teardown Phase

- Outside Plant
- Inside Plant
- Customer Premises

- Continuous Cost of Infrastructure
- Operational Planning
- Maintenance and Repair
- Operations, Administration and Maintenance (OAM)
- Customer Relationship Management (CRM)
- Physical Connection
- Administrative Subscription
- Inside Plant Connection

- Teardown Phase
- Planning Phase
- Deployment Phase
- Migration Phase

- Cost classification

- Flexibility Point
- Trenching
- Fibre
- Passive Equipment
- Optical Line Termination
- Passive Equipment
- Infrastructure (e.g., Racks)

- Marketing
- Pricing and Billing
- Housing
- Cooling
- Outside Plant
- Inside Plant
- Customer Premises
- Helpdesk
- Customer Relationship Management (CRM)
- Operations, Administration and Maintenance (OAM)
- Physical Connection
- Administrative Subscription
- Inside Plant Connection

- Cost classification

- Planning
- Energy
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- Inside Plant Connection

- Cost classification
Flowchart Diagrams

- Network Failure
- Repair Network
- Test Network
- Network OK
- Network NOK
- Network Repaired
Activity-based costing

\[ \text{costA1} + p \cdot \text{costA2} + (1-p) \cdot \text{costA3} + \text{costA4} \]
Scenario comparison

E.g. cable cut repair fiber vs copper network

Yearly average for 10,000 customers

Unit cost (repair duration)

- Copper, reactive + preventive
- Fiber pt2pt
- Fiber pt2mpt

Urban, semi-urban, rural
Discrete Event Simulation
e.g. optimal use of freelance personnel
Discrete Event Simulation
e.g. optimal use of freelance personnel

Resources

1

N

Process

Action 1

Action 2

Action N

1 – 1 – 1

29
Discrete Event Simulation
e.g. optimal use of freelance personnel

Resources

Process

Action 1

1 – 1 – 1

Action 2

1 – 1 – 1

Action N

1 – 1 – 1
Discrete Event Simulation
e.g. optimal use of freelance personnel

Resources

Process

Action 1

1 – 1 – 1

Action 2

1 – 1 – 1

Action N

1 – 1 – 1

optimization
Discrete Event Simulation
e.g. optimal use of freelance personnel

**Resources**

1

N

**Process**

Action 1

1 - 1 - 1

Action 2

1 - 1 - 1

Action N

1 - 1 - 1
Discrete Event Simulation
e.g. optimal use of freelance personnel

Resources

Process

Action 1
1 - 1 - 1

Event

Action 2

Action N
1 - 1 - 1
Discrete Event Simulation
e.g. optimal use of freelance personnel
Discrete Event Simulation

e.g. optimal use of freelance personnel

Resources

1  

N

Process

Action 1

1 – 1 – 1

Action 2

1

Action N

1 – 1 – 1
Discrete Event Simulation  
e.g. optimal use of freelance personnel

Resources

1

N

Process

Action 1

1 - 1 - 1

Action 2

1

Action N

1 - 1 - 1
Discrete Event Simulation
e.g. optimal use of freelance personnel

Resources

Process

Action 1

1 - 1 - 1

Wait for action 2

Action 2

Action N

1 - 1 - 1
Discrete Event Simulation
e.g. optimal use of freelance personnel

Resources

Process

Use freelance
How to get to process cost optimization?

<table>
<thead>
<tr>
<th>overview</th>
<th>classification</th>
<th>modeling</th>
<th>estimation</th>
<th>optimization</th>
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Essential steps

- **strategic geo-marketing**
- **synergetic installation**
- **detailed operational modeling**
- **holistic view**
Strategic Planning Looks into the Future

- Now
- 10y
- 25y

- High Certainty
  - No future
- Less Certain Future
- Uncertain Vision
Strategic Planning: A Stepwise Process
Strategic Planning: A Stepwise Process

- **Scope**
- **Refine**
- **Model**
- **Evaluate**

The diagram illustrates the stepwise process of strategic planning, starting with "Scope," followed by processes of "Refine," "Model," and "Evaluate," forming a cycle.
Sensitivity Analysis
The Effect of Uncertainty
Sensitivity Analysis
The Effect of Uncertainty

Risk
Real Options
The Effect of Flexibility in the Business Plan
Real Options
The Effect of Flexibility in the Business Plan

Reduction of Risk
Real Options
Where to look for

- Invest
  - Scale Up
  - Scope Up
  - Switch Up

- Wait
  - Start or Study

- Desinvest
  - Scale Down
  - Scope Down
  - Switch Down
Game Theory
How Will Competition Influence My Business Case

Use of Game Theory to find the balance and best strategy
Essential steps for improving the FTTH business case

- **strategic geo-marketing**
- **synergetic installation**
- **detailed operational modeling**
- **holistic view**
9th Conference of Telecommunication, Media and Internet Techno-Economics

Call for papers:

Techno-economic areas
- Customer Behavior
- Telecom Market Analysis
- Cost Optimization
- Investment Analysis
- Multi-actor Analysis
- Techno-economic Tooling and Concepts

Application areas
- Mobile and wireless networks
- Optical network technologies
- Distributed architectures
- New media and content applications
- Green ICT
- ...

Ghent, Belgium
June 7-9, 2010

http://www.ctte-conference.org/
ctte2010@intec.ugent.be