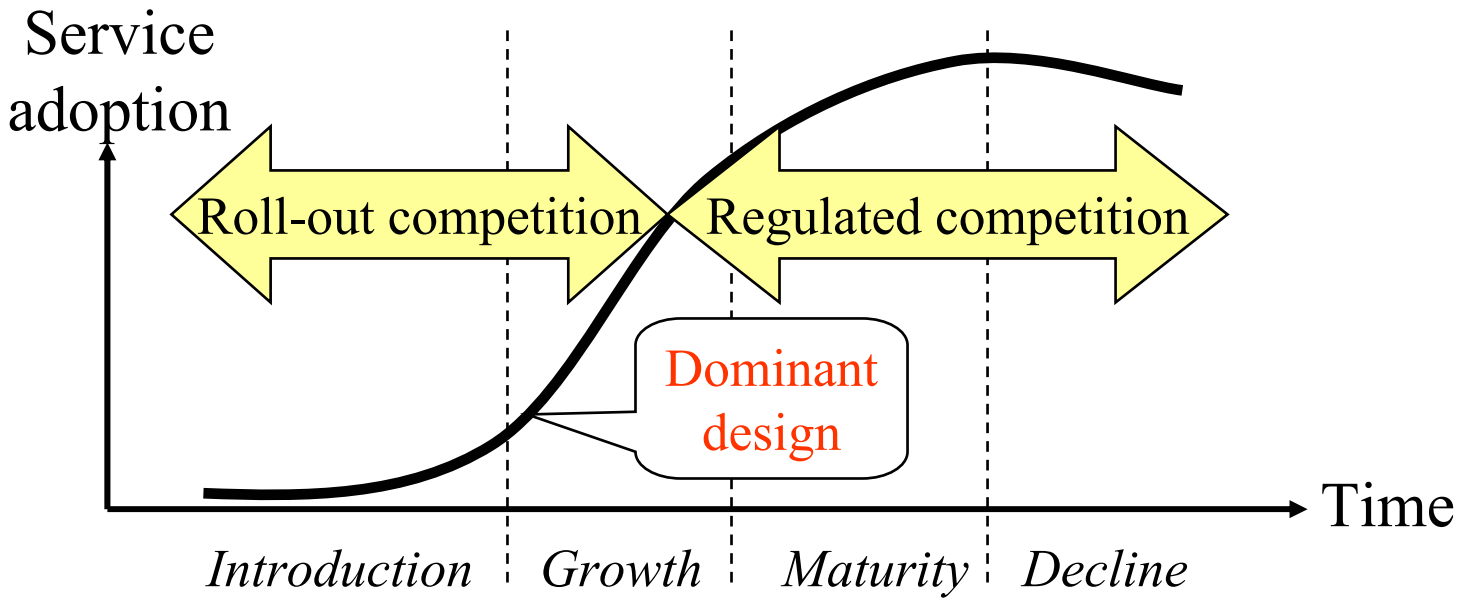
Competition

S-38.041 Networking Business

Competition and service life cycle



- Regulator can intervene when sufficient market data exists
- Dominant design and market shares are often established before regulatory intervention

Competition and service type

Network effect

	Literal	*Virtual*
Indirect	Commercial content (Internet)	Handset battery
Direct	Person-to-person (Internet)	Mobile handset

- Network effect is strongest when *direct* and *literal* (e.g. person-to-person)
  - ⇒ End-to-end interoperability more important than differentiation
  - ⇒ Scale economy drives ⇒ players become big
  - ⇒ Competition oligopolistic ⇒ regulator likely to intervene
- Network effect is weaker when *indirect* (e.g. commercial content)
  - ⇒ Only partial interoperability required (client-server)
  - ⇒ Differentiation can bring advantages ⇒ fragmentation
  - ⇒ Social surplus can be maximized despite fragmentation
  - ⇒ Regulator less likely to intervene

Generic business strategies

Competitive scope	Competitive advantage: Lower cost	Competitive advantage: Differentiation
Broad target	*Cost leadership*	*Differentiation*
Narrow target	*Cost focus*	*Differentiation focus*

- Cost leadership may lead to a beneficial circle: high market share ⇒ economy of scale ⇒ volume purchase discounts
- Differentiation leadership may enable higher profits

Game theory

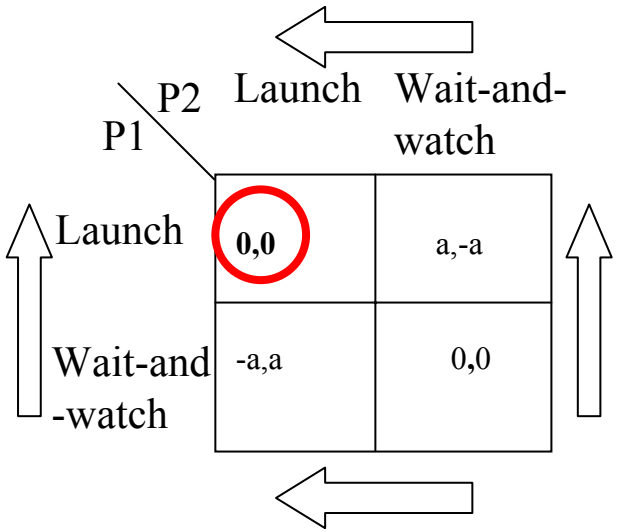
Models for two-player markets

- Cournot competition model
  - **quantity** as strategic variable (quantities posted)
  - market price depends on and adjusts for the market quantity
  - all market quantity sold, at the same price
- Bertrand competition model
  - **price** as strategic variable (prices posted)
  - quantities adjusted by customers
  - minimum of all the firms' prices determines market price
- Stackelberg competition model
  - dynamic: one firm sends its quantity / price first to the market
  - for duopoly, either price or quantity leadership

Game theory

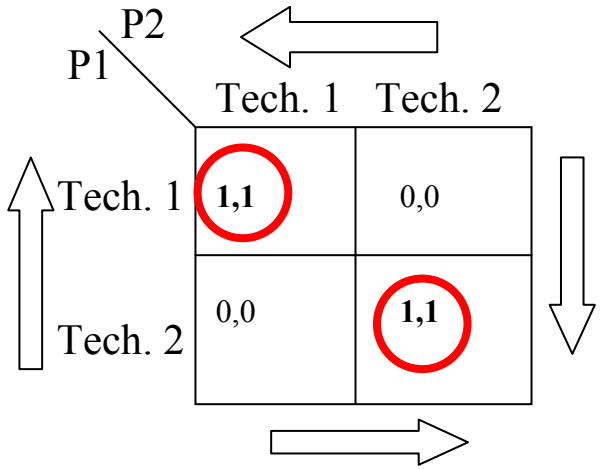
Nash Equilibrium: examples in mobile industry

New service roll-out decision
(first mover advantage)



One Nash Equilibrium

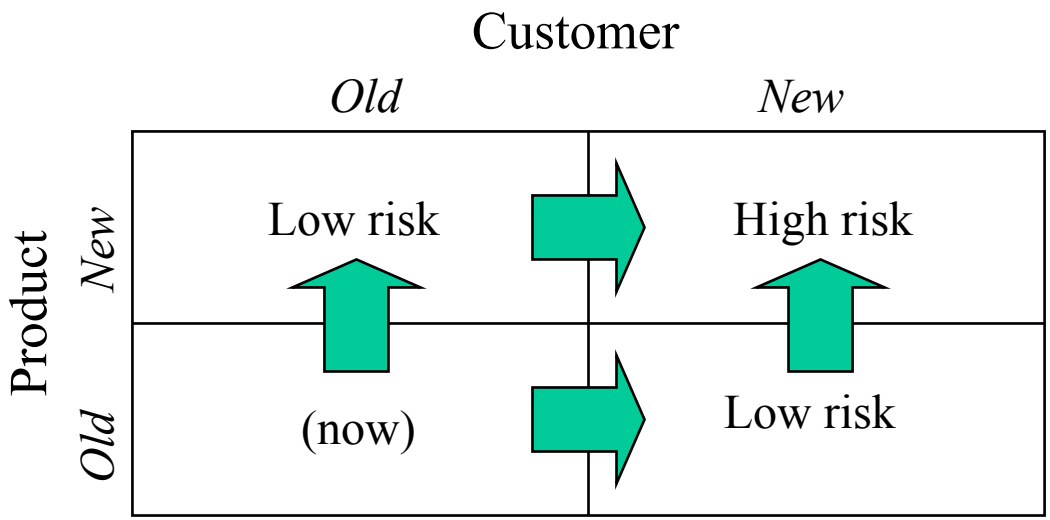
Technology choice decision
(network effect in interconnect)



Two Nash Equilibriums

Market entry strategies

Incumbent's desire for risk control

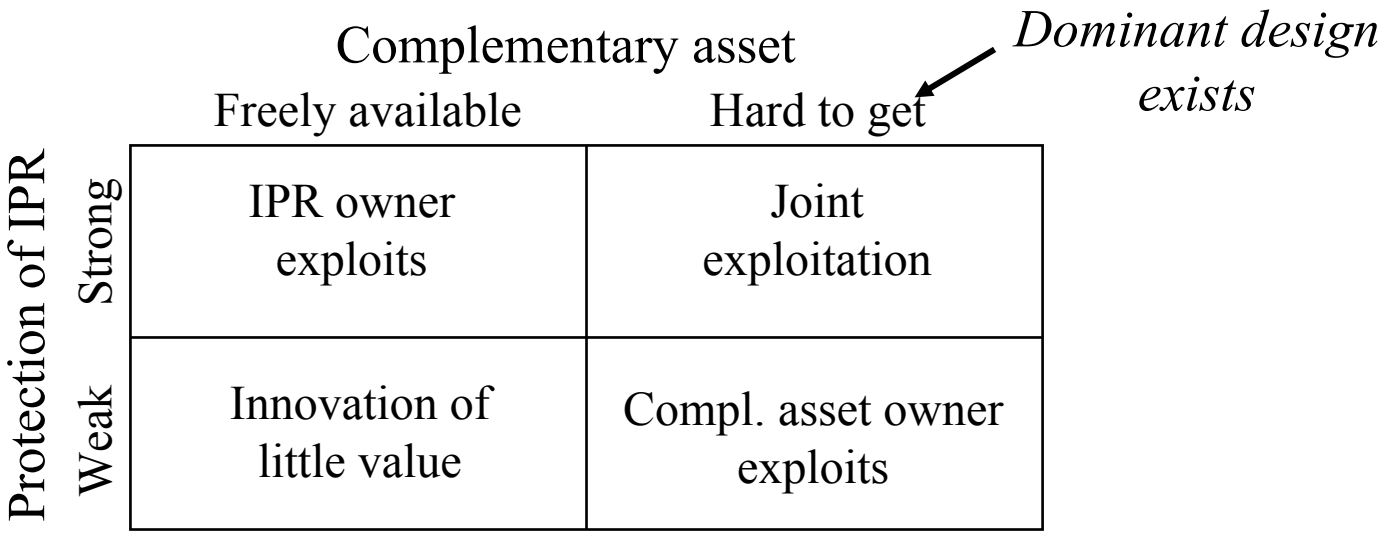


- Incumbent has something to lose ⇒ often takes limited risks only
- New product category and new customer segment involve risks
- "One risk at a time" helps managing risks
- Sometimes time pressure forces taking both risks at the same time

Source: Teece, 2001 (modified)

Market entry strategies

Innovator's need for complementary assets



- Complementary assets turn an innovation into commercial success
- Innovator should as early as possible
  - identify the required complementary assets (e.g. sales channel, technology)
  - identify toughest competition: imitators vs. complementary asset owners
  - define strategy with respect to complementary assets
  - in case of "too heavy" innovation ⇒ sell IPR immediately

Source: Teece, 2001 (modified)

Market entry strategies

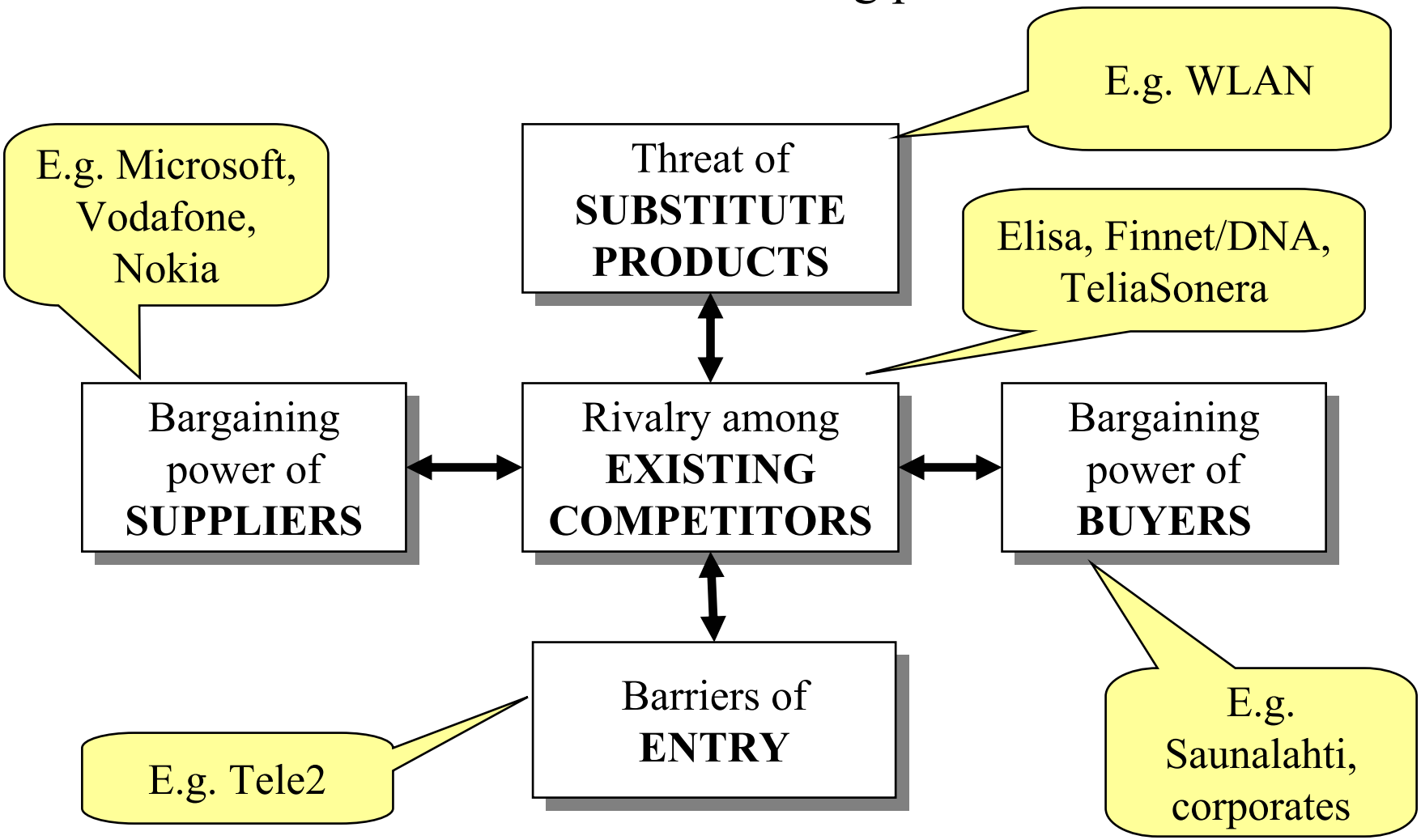
Example: Virtual Mobile Network Operators

	Price	**Focus**	**Differentiate**	**Reselling**	**Clustering**
Source of roaming contacts	Local MNO	Local MNO	Local MNO	Self	Foreign MNO
Source of service platforms	Local MNO	Local MNO	Self	Self	Foreign MNO
Importance of content partners	Low	Low	High	Low	High
Importance of new services	Low	Medium	High	Medium	High
Importance of own brand	Medium	High	High	Low	High
Feasible number of subscribers	High	Low	Low/medium	High	Medium
Feasible ARPU	Low	High	High	Low	Medium
Typical initial target segment	Students	Minorities	Early adopters	Other MVNO	Business users

Source: Kiisk/Hämmäinen, 2004

Porter's 5 forces

GPRS in Finland: Big picture



Porter's 5 forces

GPRS in Finland: Barriers of entry (e.g. Tele2)

1. Government policy (e.g. number and conditions of licenses)
2. Capital requirements (e.g. cost of radio coverage)
3. Economies of scale (e.g. cost of service platform)
4. Switching cost of customers (reduced by number portability)
5. Access to distribution channels (operator-specific retail)
6. Product differentiation (only for new value-added services)
7. Cost disadvantages independent of scales
   - favorable locations (BTS towers)
   - learning curve (competent staff)
   - (proprietary)
   - (favorable access to raw materials)
   - (government subsidies)

Porter's 5 forces

GPRS in Finland: Rivalry among existing operators

1. Capacity augmented in large increments
2. High exit barriers
3. Numerous or equally balanced competitors
4. Slow industry growth
5. High fixed or storage costs
6. Lack of differentiation or switching costs
7. Diverse competitors
8. High strategic states

Porter's 5 forces

GPRS in Finland: Bargaining power of buyers (e.g. large firms)

1. Products are standard or undifferentiated
2. Buyer faces few switching costs (e.g. coupling between Intranet and GPRS)
3. Buyer has full information
4. Buyer purchases large volumes relative to the seller's sales
5. Buyer purchases are a significant portion of the buyer's total costs
6. Product is unimportant to the quality of the buyers' products or services

Porter's 5 forces

GPRS in Finland: Bargaining power of suppliers

1. Few suppliers (e.g. infra suppliers)
2. Not obliged to contend with other substituted products
3. Industry is not an important customer of the supplier group
4. Suppliers product is an important input to the buyers business
5. The supplier groups products are differentiated or it has built up switching costs
6. The supplier group poses a credible threat of forward integration

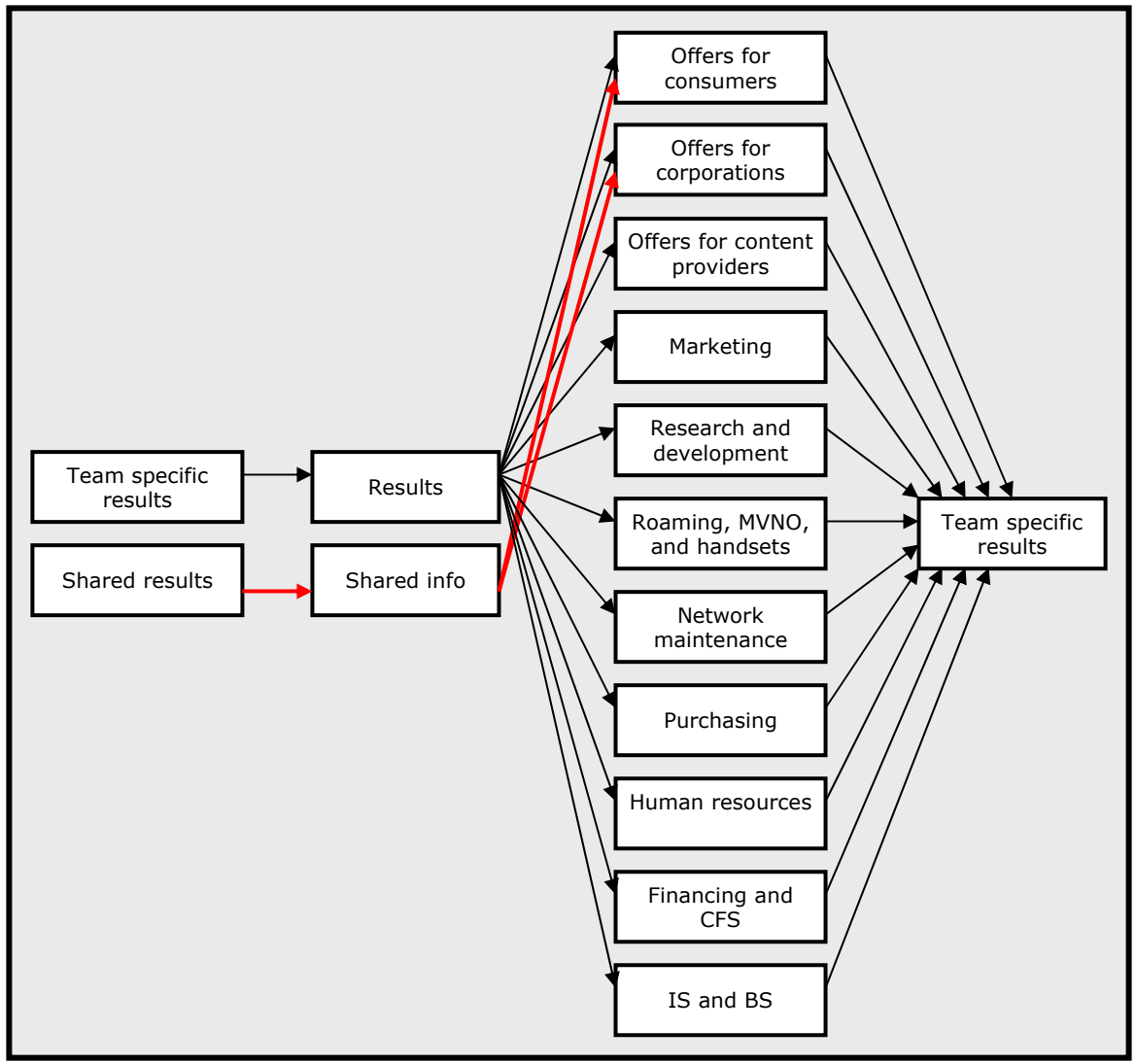
Mobile operator business game

Introduction (MOB)

- *"The purpose of a teaching simulation is to convey experimental lessons transferable to the real world"* (Lane 1995)
- *"The game [simulation] is valid to the degree that the learning objectives are achieved by the participants"* (Peters et al. 1998)
- MOB game aims to teach about the
  - possible futures creatable by players
  - tough job of decision-making
  - business dependencies and constraints
  - the importance of teamwork
- Important for players to keep in mind
  - keep the big picture clear (your strategy, market status, own status)
  - agree on responsibilities within your management team
  - appreciate the learning experience of others (e.g. be positive)
  - explore opportunities
  - be a good guinea pig!
  - have fun!

Mobile operator business game

Market feedback loop



Mobile operator business game

Offers for consumers – pricelist of voice services

Main	**Offers for Consumers**	Offers for Corporations	Offers for Content Providers	Marketing	Research and Development
Roaming, MVNO, & Handsets	Network Maintenance	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet

Voice Services	Data Services	Messaging Services

Offers for Consumers

Postpaid subscription

	Season 1	Season 0
Nr. of postpaid subs		465 500
Opening charge:		3,90
Monthly charge:		3,90
Calls (€/min):		
07:00-17:00		0,18
Other		0,14
Roaming		0,00
Average min/subs/year: 07:00-17:00		816,00
Average min/subs/year: other		816,00
Estimated nr. of postpaid subs		
Estimated average min/subs/year: 07:00-17:00		
Estimated average min/subs/year: other		
Revenues (k€)		143 337
Estimated revenues (k€)	0	

Prepaid subscription

	Season 1	Season 0
Nr. of prepaid subs		24 500
Opening charge:		10,00
07:00-17:00		0,25
Other		0,20
Roaming		0,00
Average min/subs/year: 07:00-17:00		816,00
Average min/subs/year: other		816,00
Estimated nr. of prepaid subs		
Estimated average min/subs/year: 07:00-17:00		
Estimated average min/subs/year: other		
Revenues (k€)		8 996
Estimated revenues (k€)	0	

Graphs

Postpaid

Prepaid

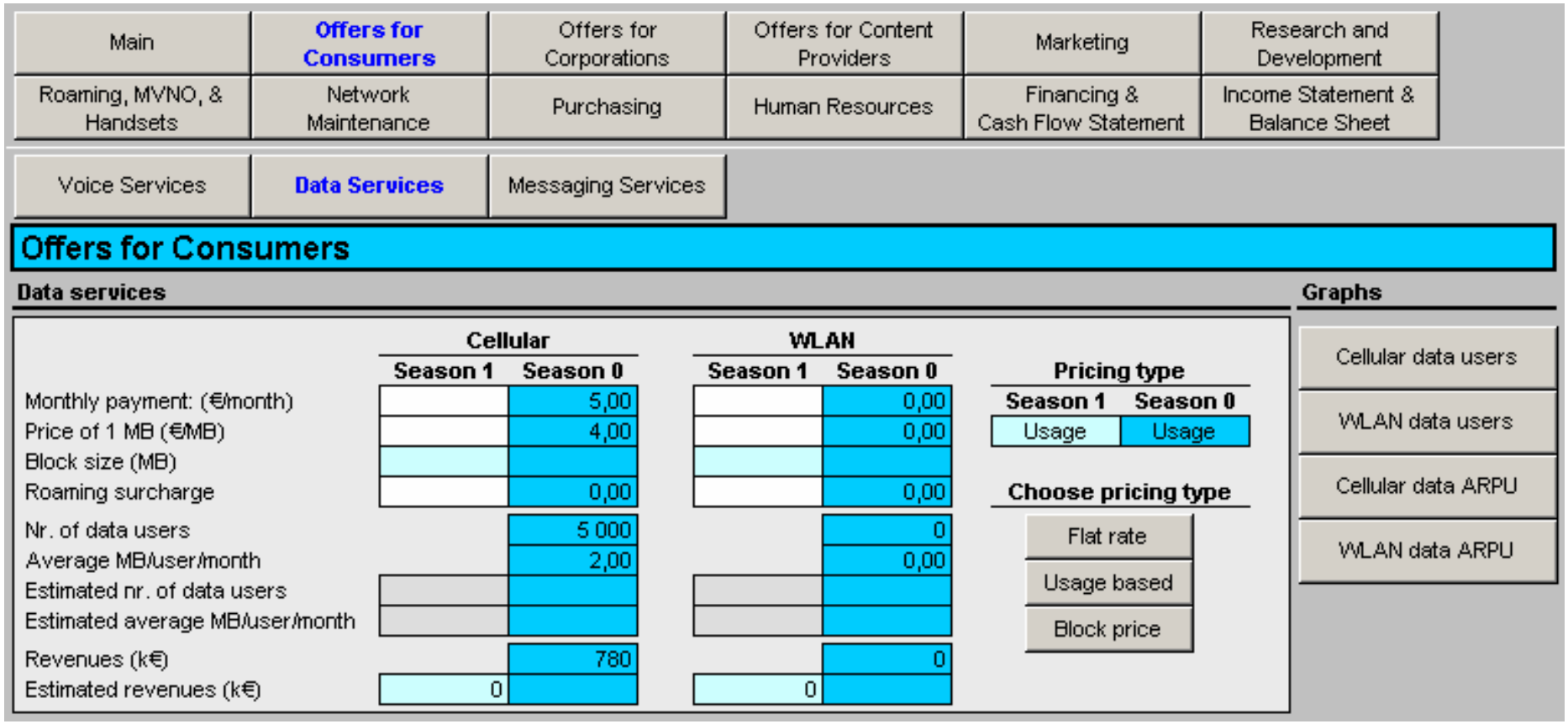
Postp

Prep

- Postpaid vs. prepaid subscriptions?
- Importance of peak-load pricing?

Mobile operator business game

Offers for consumers – pricelist of data services



- Most successful pricing type?
- Cross-elasticity between WLAN and cellular?

Mobile operator business game

Marketing

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	**Marketing**	Research and Development
Roaming, MVNO, & Handsets	Network Maintenance	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet

Marketing

Marketing

	Investment		
	Season 1	Season 0	
Marketing investments:		80 000	k€
Effort on voice:	70	85	%
Effort on data:	30	15	%
Effort on content:	0	0	%
Total:	100	100	%

Graphs

- Marketing investments: Voice
- Marketing investments: Data
- Marketing investments: Content

Segment allocation of advertising message:	Voice (%)		Data (%)		Content (%)		
	Season 1	Season 0	Season 1	Season 0	Season 1	Season 0	
Innovators:	0	0	45	80	100	100	%
Early adopters:	0	0	40	20	0	0	%
Majority:	50	90	15	0	0	0	%
Laggards:	50	10	0	0	0	0	%
Total:	100	100	100	100	100	100	%

Marketing info

Season	0	1	2	3	4	5	6	7	8	9
Successful voice investment (k€):	85,00									
Image multiplier for voice:	1,15									
Successful data investment (k€):	50,00									
Image multiplier for data:	1,29									
Successful content investment (k€):	85,00									
Image multiplier for content:	1,15									

- Optimal level of marketing expenditure?
- Hit rate of marketing efforts?

Mobile operator business game

Research and development

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	Marketing	**Research and Development**
Roaming, MVNO, & Handsets	Network Maintenance	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet

Research and Development

Research and Development

Technologies:	Investment (k€)		Research (%)		Testing (%)		Standardisation (%)		
	Season 1	Season 0	Season 1	Season 0	Season 1	Season 0	Season 1	Season 0	
GSM		80 000	40	40	30	30	30	30	OK
GPRS		20 000	40	40	30	30	30	30	OK
EDGE		0	40	0	30	0	30	0	OK
WCDMA		0	35	0	35	0	30	0	OK
WLAN		0	35	0	35	0	30	0	OK
Application & service platforms		5 000	30	40	30	30	40	30	OK

Research and Development Info

Season	0	1	2	3	4	5	6	7	8	9
GSM	2									
GPRS	1									
EDGE	0									
WCDMA	0									
WLAN	0									
Application & sevice platforms	1									

Graphs: Investments on R&D

Investment on GSM	Investment on GPRS	Investment on EDGE	Investment on WCDMA	Investment on WLAN	Investment on application & serv.

- Most successful technologies?
- Optimal level of technology competence?

Mobile operator business game

Network maintenance

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	Marketing	Research and Development
Roaming, MVNO, & Handsets	**Network Maintenance**	Purchasing	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet

Network Maintenance

Access networks

Equipment	National coverage (%)	Capacity (simult. users)	General condition (%)	Usage-level (%)	Season 0 Investment on maint. (k€)	Season 1 Investment on maint. (k€)
GSM	NW	600 000	95,00	70,00	500	
GPRS	NW	3 000	95,00	70,00	200	
EDGE	NW	0	0,00	0,00	0	
WCDMA	NW	0	0,00	0,00	0	
WLAN (public indoor)	NW	0	0,00	0,00	0	

Graphs: Previous investments on GSM/GPRS; Previous investments on EDGE; Previous investments on WCDMA; Previous investments on WLAN

Core network

Equipment	Capacity (simult. users)	General condition (%)	Usage-level (%)	Season 0 Investment on maint. (k€)	Season 1 Investment on maint. (k€)
CS core	600 000	95,00	70,00	500	
PS core	3 000	95,00	70,00	200	

Graphs: Previous investments on CS core; Previous investments on PS core

Supplementary equipment

Equipment	Capacity (simult. users)	General condition (%)	Usage-level (%)	Season 0 Investment on maint. (k€)	Season 1 Investment on maint. (k€)
Middleware & service platforms	500 000	95,00	70,00	100	
Billing and charging systems	600 000	95,00	70,00	100	
HLR (# of subscribers)	2 500 000	95,00	70,00	100	

Graphs: Previous investments on Middleware & serv.; Previous investments on billing and char.; Previous investments on HLR

Development of quality indexes

Season	0	1	2	3	4
Voice	1,1				
Data	1,1				
Messaging	1,1				

Season	5	6	7	8	9
Voice					
Data					
Messaging					

- Optimal quality ?

Mobile operator business game

Purchasing

Main	Offers for Consumers	Offers for Corporations	Offers for Content Providers	Marketing	Research and Development
Roaming, MVNO, & Handsets	Network Maintenance	**Purchasing**	Human Resources	Financing & Cash Flow Statement	Income Statement & Balance Sheet

Purchasing

Core equipment	**Current capacity**	**Unit price (€)**	**Price (k€)**	**Season 0 Capacity**	**Season 1 Capacity**
PS core (simultaneous users)	3 000	100,00	0,00	3 000	
CS core (simultaneous users)	600 000	100,00	0,00	200 000	
Middleware, application and service platform	500 000	10,00	0,00	200 000	
HLR (# of subscribers)	2 500 000	10,00	0,00	1 500 000	
Billing and charging system (# of subscribers)	600 000	10,00	0,00	200 000	

Cellular radio network		**Unit price (€)**	**Price (k€)**	**Season 0 Capacity**	**Season 1 Capacity**
GSM capacity (simultaneous users)	600 000	500,00	0,00	200 000	
GPRS capacity (simultaneous users)	3 000	1 000,00	0,00	3 000	

WLAN network		**Unit price (€)**	**Price (k€)**	**Season 0 Capacity**	**Season 1 Capacity**

Graphs

- Purchases: Core equipment
- Purchases: Cellular radio network
- Purchases: WLAN network

- Demand-supply balancing?