

Charging and Billing (C&B)





Schedule

Date	Topic
14.03.2008	Course introduction. Big picture. (HH)
19.03.2008	Consumer customers (HH)
21.03.2008	No lecture (Easter)
26.03.2008	No lecture (Easter)
28.03.2008	Enterprise customers (HH)
02.04.2008	Operators (AK)
04.04.2008	Transport pricing (AK)
09.04.2008	Mobile operator competition (HH/TB)
11.04.2008	Content pricing (HV)
16.04.2008	Investments (TS)
18.04.2008	Interconnect and roaming (HH)
23.04.2008	Charging and billing (HV)
25.04.2008	Regulation (TS)
30.04.2008	Spectrum, course wrap-up (TS)



Definitions

Charging: To set or ask (a given amount) as a price Billing: Request for payment of a debt

Price is cost of one unit (of usage), tariffs define how prices and usage combine into **charges**, that are **billed** from the user.





Traditional payment systems

US market- Value and volume of payments





• Mass of micropayments to be optimized



Traditional payment systems Key features

	Cash	Credit card	Debit cards	Accumulating balance
Cost per transaction	low	high	high	low
Merchant fixed cost	low	high	high	high
User fixed cost	0	high	low	low
Merchant fee	0	3-5%		
Account required	no	yes	yes	yes
Anonymous	yes	no	no	no
Risk for consumer	yes	limited	limited	no
Risk for merchant	no	yes	no	yes



Basic business sectors





Revenue models

Revenue model	Examples	Revenue source		
Advertising	Yahoo.com	Fees from advertizers in exchange for advertisements		
Subscription	WSJ.com Sportsline.com	Fees from subscribers in exchange for access to content		
Transactions	eBay.com E Trade.com	Fees for enabling or executing a transaction		
Sales	Amazon.com Sears.com	Retail sales of goods, information, or services		
Affiliate	MyPoints.com	Fees for business referrals		

Source: Laudon&Traver, 2003



U.S. on line payment market –merchants view



• VISA has over 50% marketshare of all Internet payments (ref. "Verified by VISA")

Source: Gartner Group, 2002



On line credit card process



- Weakness in authentication (Secure Socket Layer \Rightarrow Secure Electronic Transaction)
- High cost (e.g. 0.2-0.3 \in per transaction \Rightarrow earlier minimum purchase price)



E-commerce vs. digital content

Japanese on- line market – wired vs. mobile in 2001



Source: ECOM, Natsuno, 2003

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Digital content

Digital wallet – core technology

- Digital wallet
 - authenticates the consumer digitally (certificates, SET, etc)
 - stores and transfers value
 - secures the payment from consumer to merchant
- Potential benefits
 - one-stop-shopping for transactions and bill presentment
 - user information pre-set \Rightarrow better usability (*single sign-on*)
 - real-time integration of the complete transaction chain
 - enables small payments (< 5€) in Internet
- Two basic digital wallet approaches
 - client-based wallet for consumers (e.g. MasterCard Wallet)
 - server-based wallet for merchants (e.g. MSN Wallet/MS .NET)
 - consumers resist storing personal information in servers !
- Successful standard missing (e.g. Liberty Alliance, 3GPP)



- Mass delivery of legal mobile content with low cost (e.g. peer-to-peer MMS)
- Micropayment mediation for a large number of retailers (content aggregation)
- Operator/clearing house gets the rights clearing revenue from content retailers
- Usage rules in MRV control the usage of a content object (e.g. music)
- Mobile operator can integrate DRM with existing charging (pre/postpaid)



Operator charging and billing Basic concepts

- *Charging*: a process where subscriber accounting information is retrieved for billing purposes
- *Billing*: generate and send a bill to subscriber based on certain tariffs
- Charging and billing are key components of *Business* and *Operations Support Systems* (BSS/OSS)
- Traditional circuit switched charging is based on subscriptions and Charging Data Records (CDR) generated by network elements
- Packet switched networks involve *Internet Protocol Data Records* (IPDR, cmp. CDR) for new services such as IP telephony, public WLAN, digital cable, and content



What is a Subscription?

- For instance
 - A wire and a hole in a switchboard
 - A phone number
 - A SIM card
 - An IP address
- An agreement with customer to provide a range of services
 not at all a technical issue
- A portfolio of communication products offered to the customer

What can a Subscription contain?

5	20-30	100-300	5-15	5-10	3-10
Service Category	Core Services	Capabilities & Features	Customer Segments	Time Frame	Channels
Voice / Voip Mobile	Local / Long dist International Unified messaging Conferencing Minutes SMS, MMS, WAP Streaming GPRS, HSDSP	Call forward Caller ID Follow me Virtual TN Push-to-Talk Location IM / Chat Balance	Region 1 Region 2 Teen Young adult Family Traveller	Summer Winter Olympics Anniversary Week-end Special	Stores Call Center Self Service Retail Virtual operators
Data xDSL TV / Video	Internet access eMail, Webspace Security IPTV, DigiTV, VoD Conferencing	Speed SLA Basic service Sport package	Postpaid Prepaid Enterprise SME Home office	Thousands of Produc In Portfolio!	
Office	Storage, Firewall ASP applications				Source: Pasonen, 2005

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(enhanced Telecom Operations Map - standard)







Source: Pasonen, 2005





Operator charging and billing

Cost breakdown – example mid size operator (3 5M subs)

OPEX, billing	Unit price	#	Total per year	Comments
Personnel	90 000	100	9 000 000	
Post-processing	3 000 000	1	3 000 000	
Pre-paid/inter-operator			?	
Marketing	200 000	1	200 000	
CAPEX/billing				
Billing system	20 000 000	5	4 000 000	Divided over 5 years
Software upgrades	20 000 000	0,1	2 000 000	10% of purchase price
OPEX, charging				
Installation and maintenance	90 000	10	900 000	
CAPEX, charging				
Charging system	4 000 000	5	800 000	20% of billing system
Software upgrades	4 000 000	0,1	400 000	10% of purchase price
CAPEX, total			7 200 000	
OPEX, total			13 100 000	
Total			20 300 000	
CAPEX % of total C&B costs			35 %	

Source: Gartner Group, Comptel, Swan 2003



Operator charging and billing Cost analysis

- Total cost per bill (on paper) in traditional C&B can be several euros
- New features in mobile such as GPRS, prepaid, and multiaccess roaming add C&B costs significantly (30% ?)
- Mobile operators fight the high C&B cost by offering their service to others or by outsourcing it
- Production cost of mobile C&B transaction can be reduced by
 - avoiding paper bills (electronic bills)
 - removing credit losses (post-paid \Rightarrow pre-paid/real-time)
 - eliminating history (digital credit \Rightarrow digital cash)
 - aggregating for settlement (digital wallet)
 - automating the top-up process (digital wallet)





Mobile payments and strategy

It is not only about billing, it is about:

- authentication (ID)
- authorization (means to conduct actions)
- payments (exchange of money for value offerings)
- \rightarrow it is about visibility and trust ~ brand

Who wins?

- Network operators have networks and lots of infrastructure already in place
- Device manufacturers control software and platforms (Nokia)
- Credit card companies have the biggest unified user domains
- Traditional banks have the closest relationships with customers (though in undeveloped countries most trade is unofficial)