Wavelength on Demand? – Innovation in capacity business

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Combridge/Novatel

Wavelength (lambda) on demand – why and how?

Why

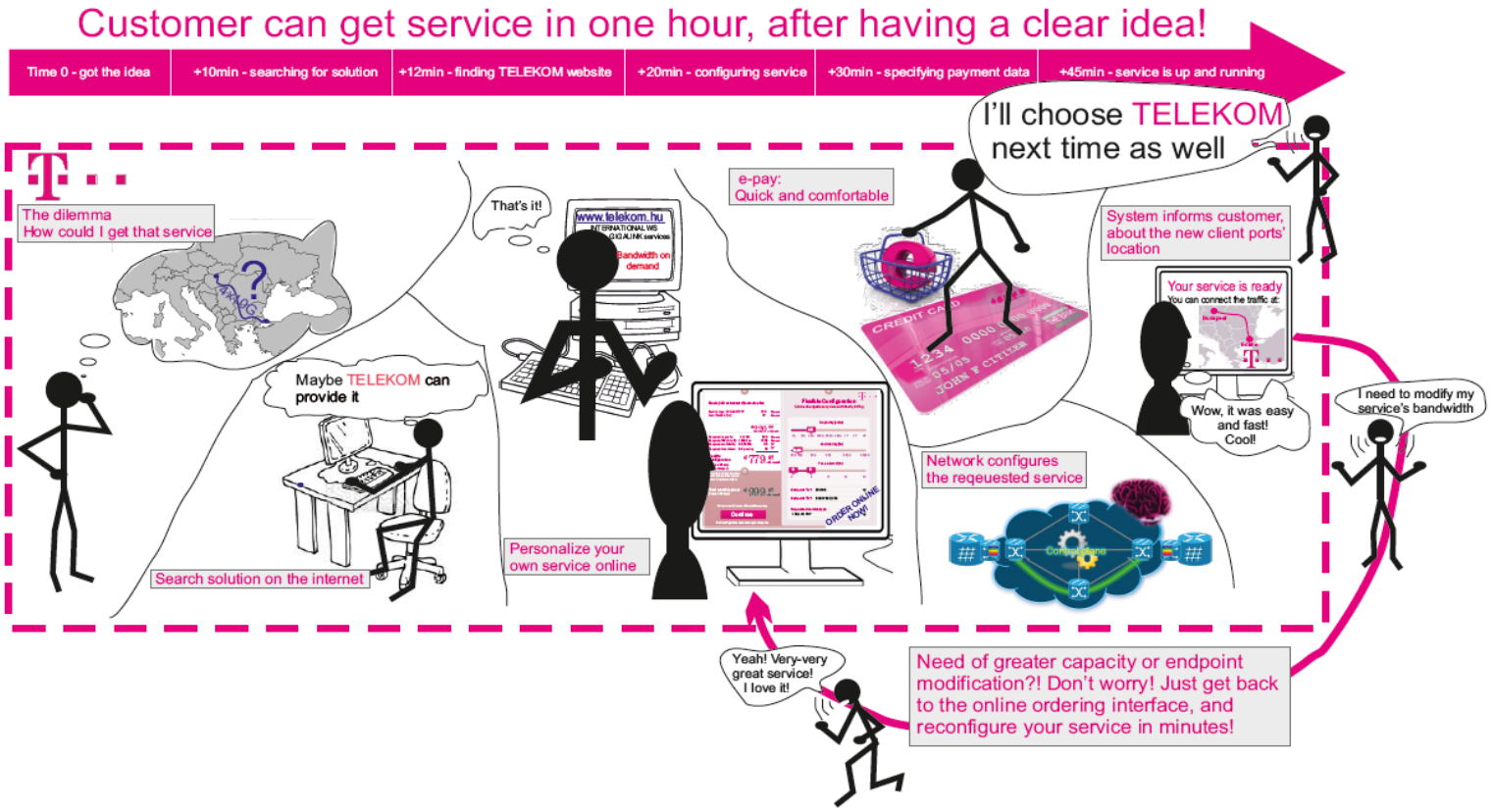
- Significant changes in High Speed Leased Lines (HSLL) usage – need for more flexible (non-static) solutions
- The prices for static wavelengths are decreasing – need for curve-back
- Open for new customer segments – from WS to Business/Large Corporate
- Increase the customer satisfaction factor
- Increase the utilization of the network, more revenue

How

- The model is IaaS – if that works, why HSLL lines on demand wouldn't work
- 1Gbps, 10Gbps, 100 Gbps capacities to be provided in a flexible way
  - Customers (WS) - modify capacity during their need in different periods of a day
  - Providers (Infrastructure owners) – utilize more efficient the network

Automatic configurable DWDM backbone

Automated Network Management	Automated DWDM	New business model	Professional CRM

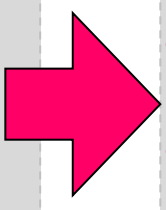


Customer experience for the New Business Model

Static

- Customer decides about the HSLL service
- Search for providers – conferences, phone
- Ask for price offers
- Budgetary offer
- Final offer – based on technical survey and some iteration about the technical solution (routing, demarc point, interface, etc.)
- Contract negotiation
- Implementation

Time to market ~2 month



On-Demand

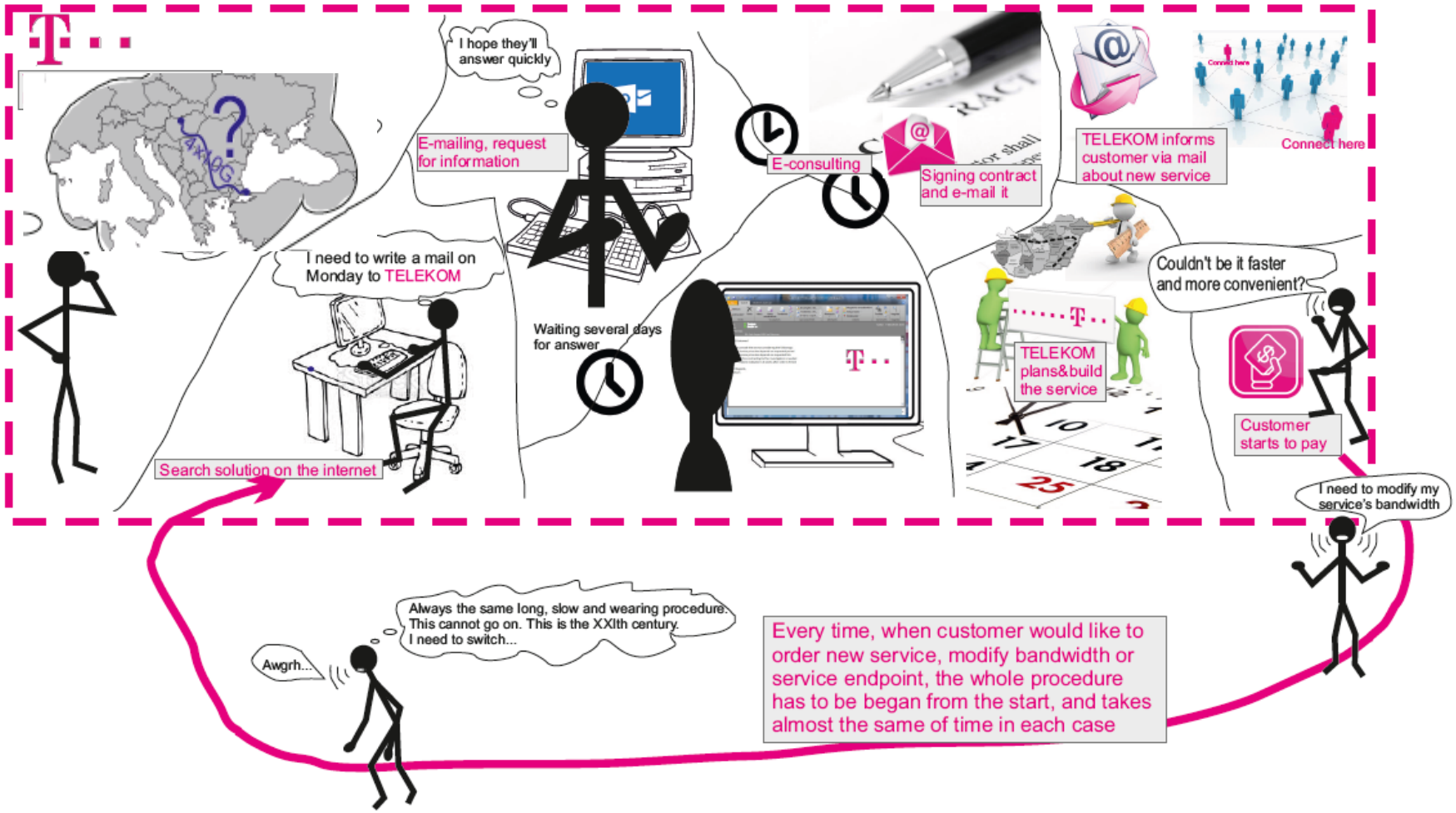
- Customer decides about the HSLL service
- Search for providers on internet – finds portals
- Configures the HSLL service
- Exact offer and RFS immediately
- Introduces the contract and billing details, have the contract immediately
- Press the submit button – implementation starts immediately
- Continuous follow-up about the implementation

Time to market ~2 hours

Customer experience for Static service

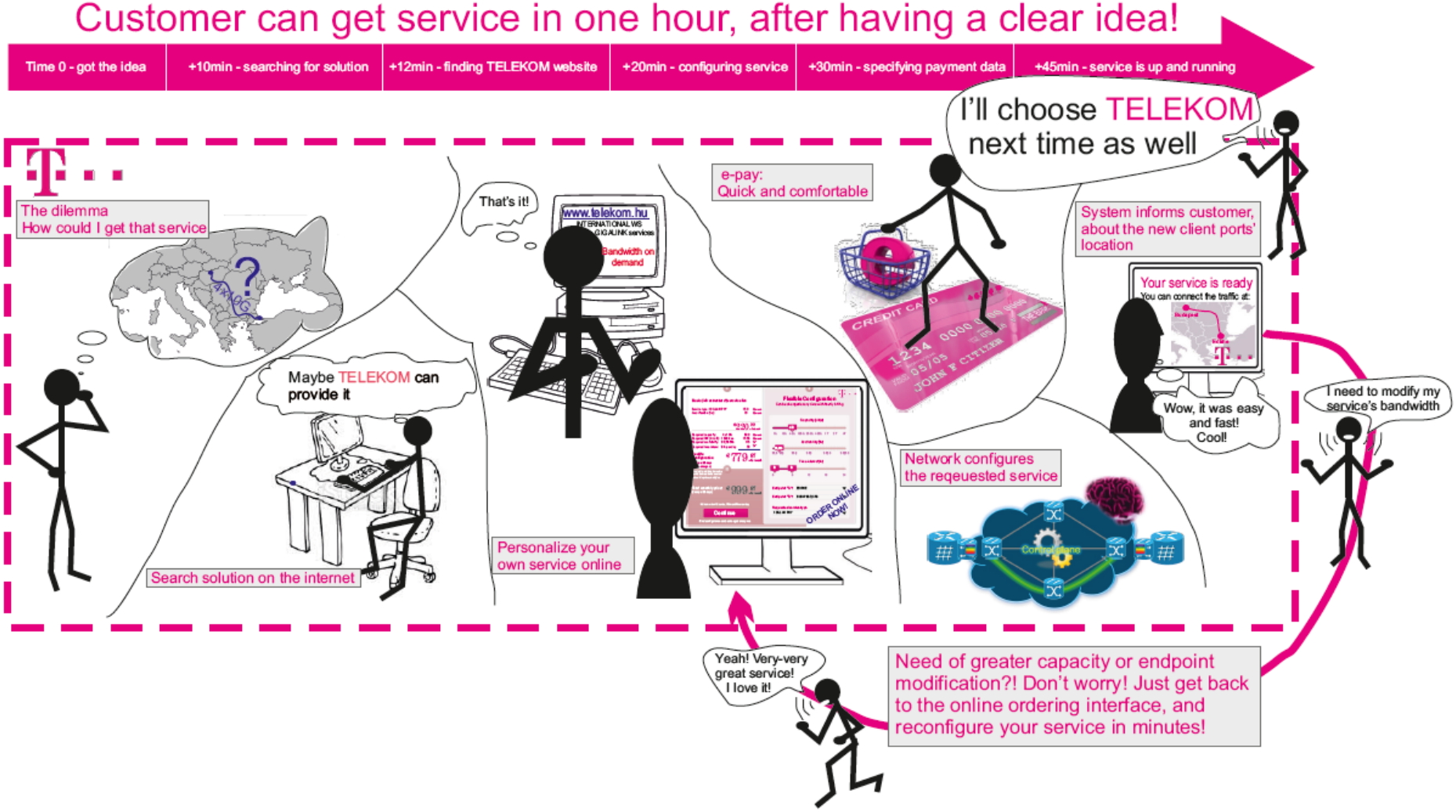
Slow, complicated, static customer service. Hard to be competitive!

Time 0 - got the idea	+10min - searching for solution	next workday - e-mail to provider	+2-4days - provider's response	+-1week - clarifying details	+1,5-2months - provider is ready, service is up and running



Customer experience for On-Demand approach

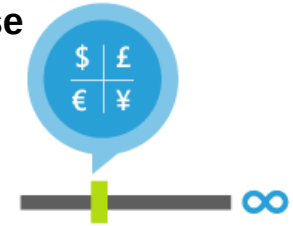
Customer can get service in one hour, after having a clear idea!

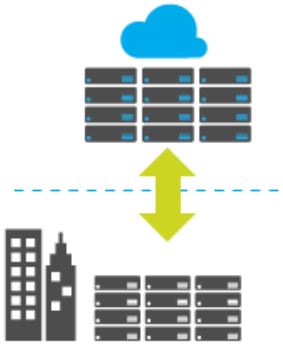


Customer experience in the New Business Model

Similar to the „Cloud" services

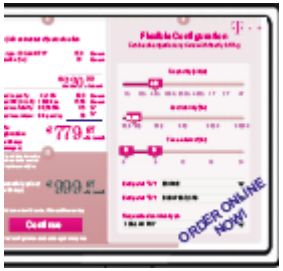
Scale on demand & pay as you use





Capacities in minutes & adjust as needed

Faster to market & better SLA



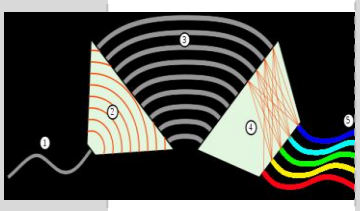
Maximum customization & standard products

Technical details about the ways of implementation

„Everyone knows that some things can not be achieved. Until someone comes who does not realize this." A. E. - Innovation

WDM network elements today

- Multiplexers
- Repeaters
- Transponders
- Optical X connects



Software Defined Optical Network (SDON)

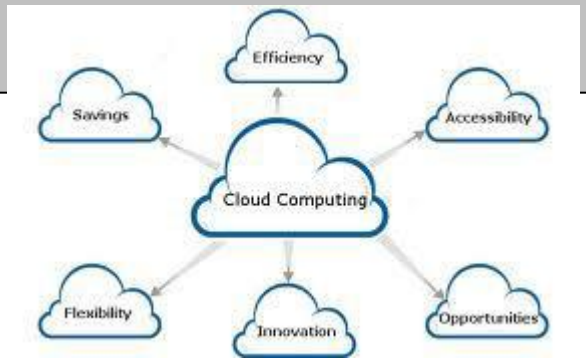
- Sophisticated Network Management
- „Smart" Transponders
- Flexgrid – EON (Elastic Optical Network)
- Automatically Switched Optical Network (ASON)
- MESH Network Topology

SDO Transport Network

- **Besides a sophisticated Network Management Systems, key elements of SDO in the Core Network are:**
- **Smart Transponders (ST) –** enables us the choose not only the frequency and wavelength but the signal bandwidth can also be configured
- Limited capabilities ST starting from next year, fully configurable 2-3 years

- **Flexgrid – EON Elastic Optical Network -** fixed "wavelength grid," will no longer work for 400 Gb/s and above, need for a more flexible grid, which is EON.
- Replacing the Multiplexers our network will be flexible and easily to configure through software

- **Automatically Switched Optical Network – ASON –** the brain of SDO, providing the switching capabilities, some capabilities are already available in the existing WDM equipment, but still not sophisticated enough.

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