A Research Ontology for Telecommunications

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WissOrg 06, 3-5 July, Vienna

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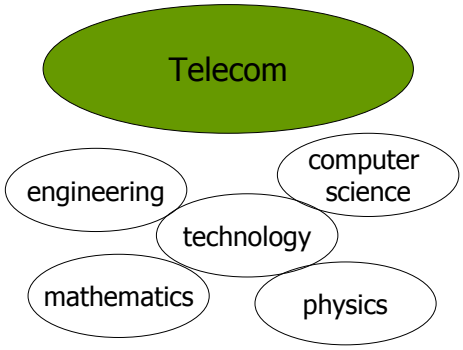
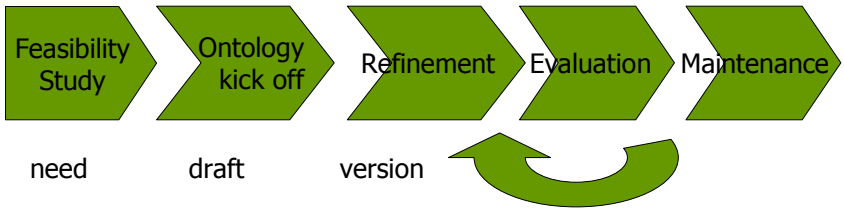
Why we need it?

- Interdisciplinary Topic
- Strong Community
- Lack of integrated Scheme



Creation and Goals



- completeness (as far as possible)
- social aspects

Coverage

- New topics (up to date)
- Including well-know keywords
- Alphabetic order of terms
- Interdisciplinary context

Easy to (re)use

- Related areas close to each other
- Flat hierarchy for human browsing
- Wide range of users, different levels (students, experts, technicians, public)
- Same cardinal number
- Documentation like naming and meta information

Integration of existing

- classification schemes, thesauri
- ontology concepts
- telecommunication models (layer)

No	Description
7	Application
6	Presentation
5	Session
4	Transport
3	Network
2	Data link
1	Physical

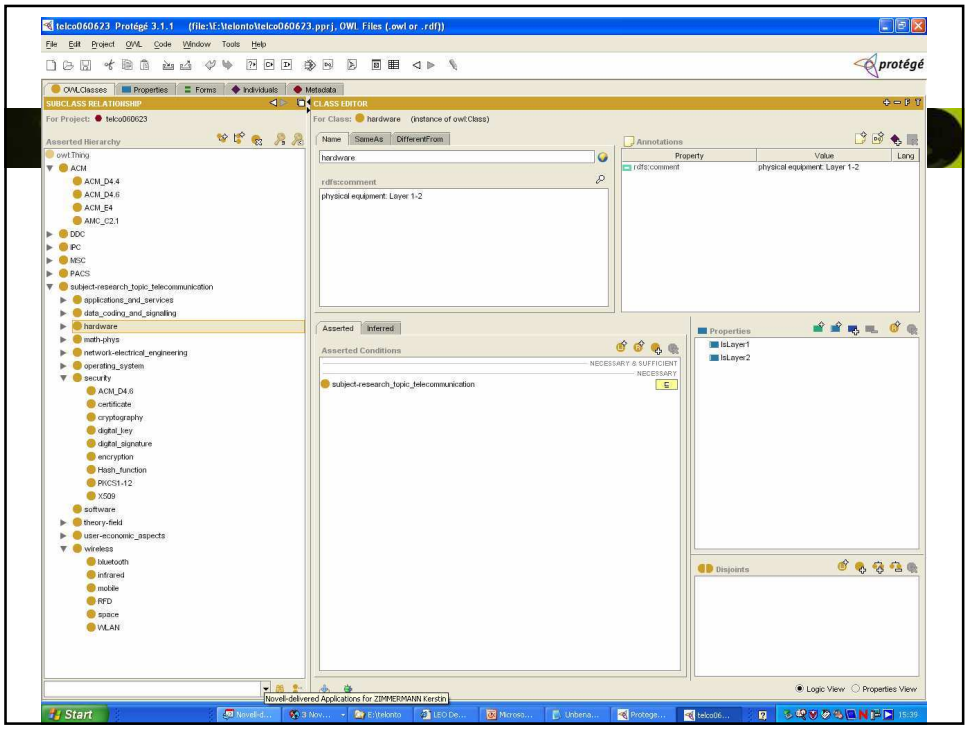
Methodology

1. Identifying the relevant terms of the domain
2. Grouping them according to their fields / meanings
3. Mapping other classes to it

Sources

- websites / homepages
- keywords in their publications
- Scirus (for scientific information only),
- visual thesaurus, UNESCO General Thesauri, RosettaNet, dandelion
- classifications schemes
  - ACM
  - DDC (techology)
  - IPC
  - MSC (methods and algorithm)
  - PACS (Electronics, radiowave and microwave)

10 Main Classes	Description	Layer
applications_and_services	techniques and protocols	4-6
data_coding_and_signalling	special point of interest	2
hardware	physical equipment	1-2
math-phys	physical effects and their mathematical description	1
network-electrical_ engineering	technical infrastructure	3
operating_system	special point of interest	
security	special point of interest	
theory-field	theoretical description	
user_and_economic_aspects	special point of interest	
wireless	special point of interest	



Naming conventions

- All classes names are written with a small initial letter e.g. *hardware*
- abbreviations are written all in capital letter e.g. *UMTS*
- In order to void blanks in the terms (not computer readable) underlines are used e.g. *operating_system*
- Special characters like / have also to be left out.
- Double class names are codes with a hyphen – e.g. *math-phys.*

applications_services: 26 subclasses

- ADSL
- ATM
- broadcasting
  - IPC_H04H
- distance_learning
- email
- fax
- FTP
- G7X
- GPS
- graphical_user_interface
- GUI
- HTTP
- ICQ
- internet
- IP
- ISDN
- MMS
- mobil_box
- PPP
- radar
- radio
- AM
- FM
- SMS
- SS7
- TCP
- teleconferencing
- telephone
- television
- UMTS
- videotext
- Voice_over_IP
- VoIP
- WAP
- WWW
- X25

data_coding_and_signalling: 25

- coding
  - ACM_E4
  - MSC_92Bxx
- data_communication
- data_compression
- data_flow
- data_model
- data_transmission
- DDC_004
- distributed_computing
- encoding
- error
- MSC_92Bxx
- format
- grid_computing
- linguistics
- messenger
- meta_data
- natural_language_processing
- ontologies
- parallel_computing
- signal_processing
- PACS_84.40Ua
- signalling
- speech
- speech_recognition
- stemming

hardware: 34

- access_point
- antenna
  - PACS_84.40Ba
- back_bone
- cable (2 instances)
- computer
- desknote
- desktop
- display
- HID
- Human_Interface_Device
- junction_box
- keyboard
- keypad
- line
- mobile_devices
- mobile_phones
- modem
- network_terminator
- note_book
- optical_fibre
- oscilator
- PAD
- palmtop
- Personal_Device_Assistant
- receiver
- resonator
- router
- satellite
- screen
- server
- street_cabinet
- switch
- terminal
- touchpad

math-phys: 23

- allgorithm (1 instance)
- amplifier
  - IPC_H03F
- DDC_510
- DDC_530
- frequency
- band
- range
- function
- impedance
- modulation
  - ICP_H03C
- noise
- oscilation
- pule_technique
  - IPC_H03K
- resonance
- sampling
- spectrum
- stabilisation
- sychronisation
- transformation (1 instance)
- transmission
  - IPC_H04B
- trigger
- wave
- mirco

network-electrical_engineering: 27

- architecture
  - AMC_C2.1
- carrier
- celluar
- circuit
  - MSC_94Cxx
- client
- collisions
- design
  - AMC_C2.1
- destination
- electro_acustics
- hub
- IP_number
- LAN
- link
- load
  - MSC_94Cxx
- p2p
- paket
- payload
- performance
- platform (6 instances)
- producer-distributor (5 instances)
- remote_control
- routing
- session
- subscriber
- switching
- technology
- traffic

operating_system = software = platform

(6 instances)

- ACM_D4.4
- producer-distributor (5 instances)

Security: 9

- ACM_D4.6
- certificate
- cryptography
- digital_key
- digital_signature
- encryption
- Hash_function
- PKCS1-12
- X509

theory-field: 8

- communication_theory
  - DDC_003.5
- information_science
  - PACS_89.70c
- information_theory (1 instance)
  - ACM_E4
  - DDC_003.54
  - entropy
  - error_probability
- logics
- telegraphy
- telematics
- telemetry
  - PACS_84.40Xb
- telephony
  - IPC_H04M

user-economic_aspects: 24

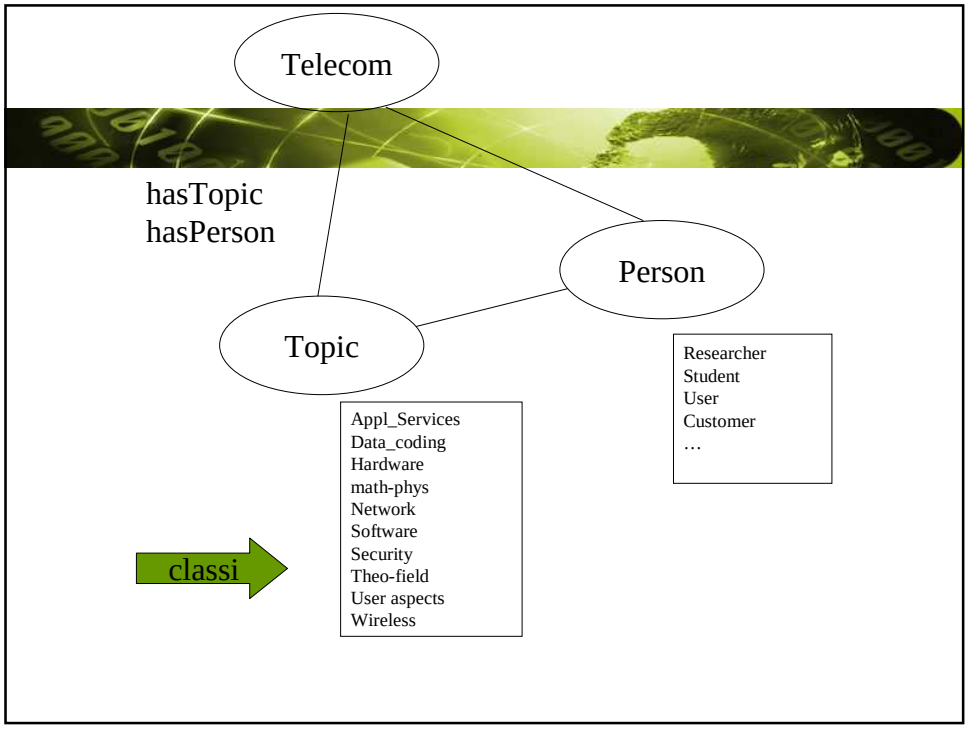
- billing
- business
- community
- costs
- data_protection
- de-regulation
- digital_devide
- download
- eCommere
- framework
- handling
- human_rights_act
- industry
- interface
- legal
- manual
- pricing
- privacy
- provider
- rate
  - flat_rate
  - transfervolume
- society
- standardisation_bodies
- tariff
- upload

Wireless: 6

- bluetooth
- infrared
- mobile
- RFD
- space
- WLAN

First Version, work in progress

- 1 concept
- 10 main fields / classes
- 200 subclasses
- 5 classification schemes
- 1 layer mode



Outline of further Ontologies (concepts)

- Organisation
- Event
- Location / Address
- Publication
- e-Learning
- Product
- Service

Ontologies

- **FOAF** (Friend Of A Friend) for communities
  Describing homepages of people, the links between them and the things they create and do
  Coverage: Person as 1 concept with 10 properties
- **SWP** (Semantic Web Portal) Ontology for Scientific Portals
  Coverage: Person (Agent and Organisation), Publication, Conference as the 3 main concepts
  68 classes, 21 data properties, 57 object properties
- **MarcOnt** for Digital libraries
  Ongoing and still under construction, do mapping of the three formats Marc21, DC, BibTeX

Thanks for your attention

- Refs, online Version

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