ENTERPRISE ARCHITECTURE AT THE UNIVERSITY OF HELSINKI

TANGIBLE RESULTS AT A REASONABLE COST

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EUNIS 2014, UMEÅ

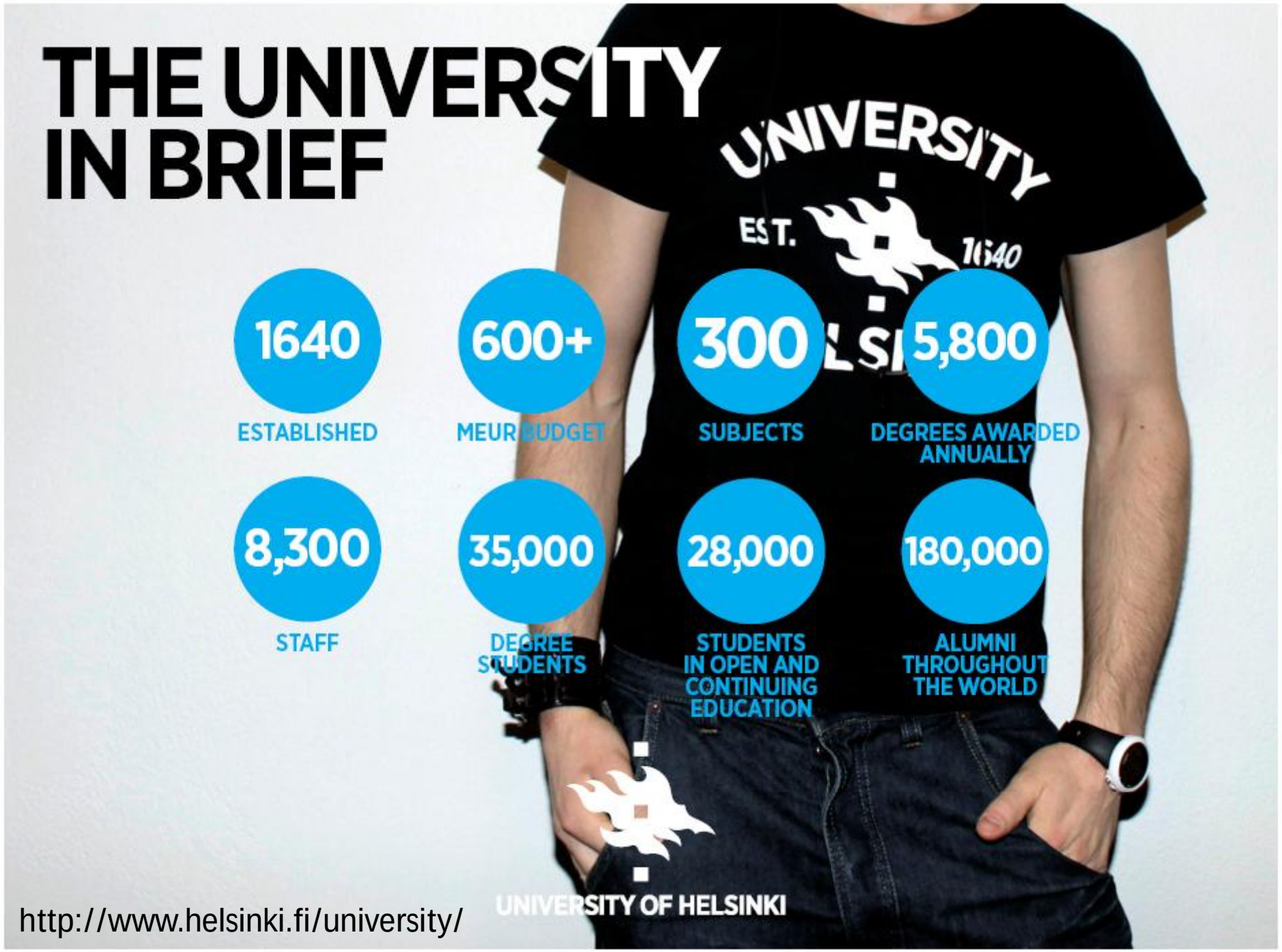
UNIVERSITY OF HELSINKI

ENTERPRISE ARCHITECTURE AT THE UNIVERSITY OF HELSINKI

- THE UNIVERSITY IN BRIEF
- ENTERPRISE ARCHITECTURE
- EA PROGRAM AT THE UNIVERSITY OF HELSINKI
  - EA Program Focus and Short History
  - Architecture Board and Architecture Principles
  - EA and Project Management
  - Master Data Management
  - EA Costs
  - Future EA Work
- LESSONS LEARNED AND RECOMMENDATIONS

UNIVERSITY OF HELSINKI

University of Helsinki in Brief


THE UNIVERSITY IN BRIEF
1640
ESTABLISHED
600+
MEUR BUDGET
300
SUBJECTS
5,800
DEGREES AWARDED ANNUALLY
8,300
STAFF
35,000
DEGREE STUDENTS
28,000
STUDENTS IN OPEN AND CONTINUING EDUCATION
180,000
ALUMNI THROUGHOUT THE WORLD
UNIVERSITY OF HELSINKI
http://www.helsinki.fi/university/

4 CAMPUSES
11 FACULTIES

CITY CENTRE CAMPUS

21,000 STUDENTS
HUMANITIES AND SOCIAL SCIENCES

FACULTY OF ARTS
FACULTY OF BEHAVIOURAL SCIENCES
FACULTY OF LAW
FACULTY OF THEOLOGY
FACULTY OF SOCIAL SCIENCES

KUMPULA CAMPUS

6,000 STUDENTS
THE LARGEST SCIENCE HUB IN THE NORDIC COUNTRIES

FACULTY OF SCIENCE

MEILAHTI CAMPUS

3,000 STUDENTS
TOP-LEVEL RESEARCH IN MEDICINE

FACULTY OF MEDICINE

VIIKKI CAMPUS

6,500 STUDENTS
TOP-LEVEL RESEARCH IN THE BIOSCIENCES

FACULTY OF BIOLOGICAL AND ENVIRONMENTAL SCIENCES
FACULTY OF VETERINARY MEDICINE
FACULTY OF PHARMACY
FACULTY OF AGRICULTURE AND FORESTRY

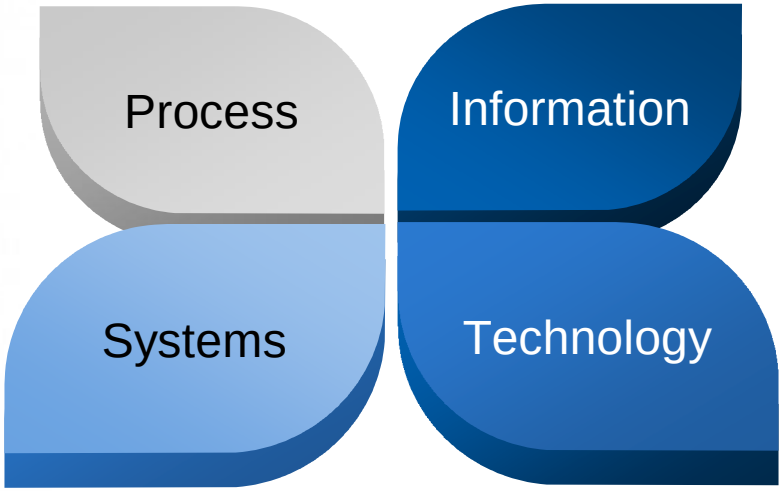
IT VOLUMES AT THE UNIVERSITY OF HELSINKI

- Personnel (FTE)
  - 217 person-years (IT Center) + other IT Staff 134 = 351 total
  - 4,4 % of all personnel
- IT Budget
  - ca. 34 million €, whereof ca. 50% in IT Center)
  - 4,9 % of Total Budget
- IT Environment
  - 17.700 workstations
  - Active User Id's: 76.200
  - Opened Helpdesk Tickets: 75.000

Enterprise Architecture

ENTERPRISE ARCHITECTURE

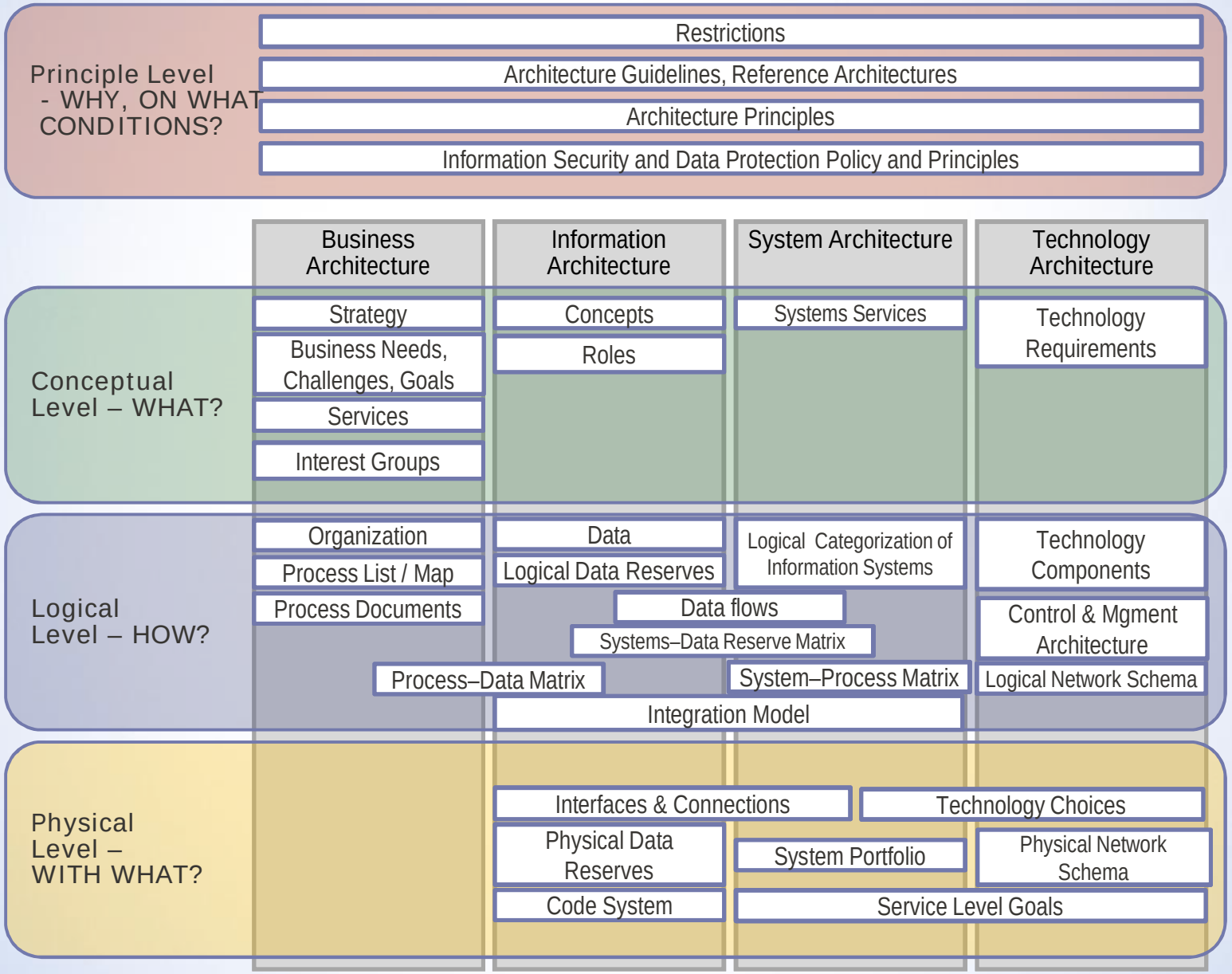
- Enterprise Architecture (EA) describes how an organization's processes, information, systems, and technology work together.



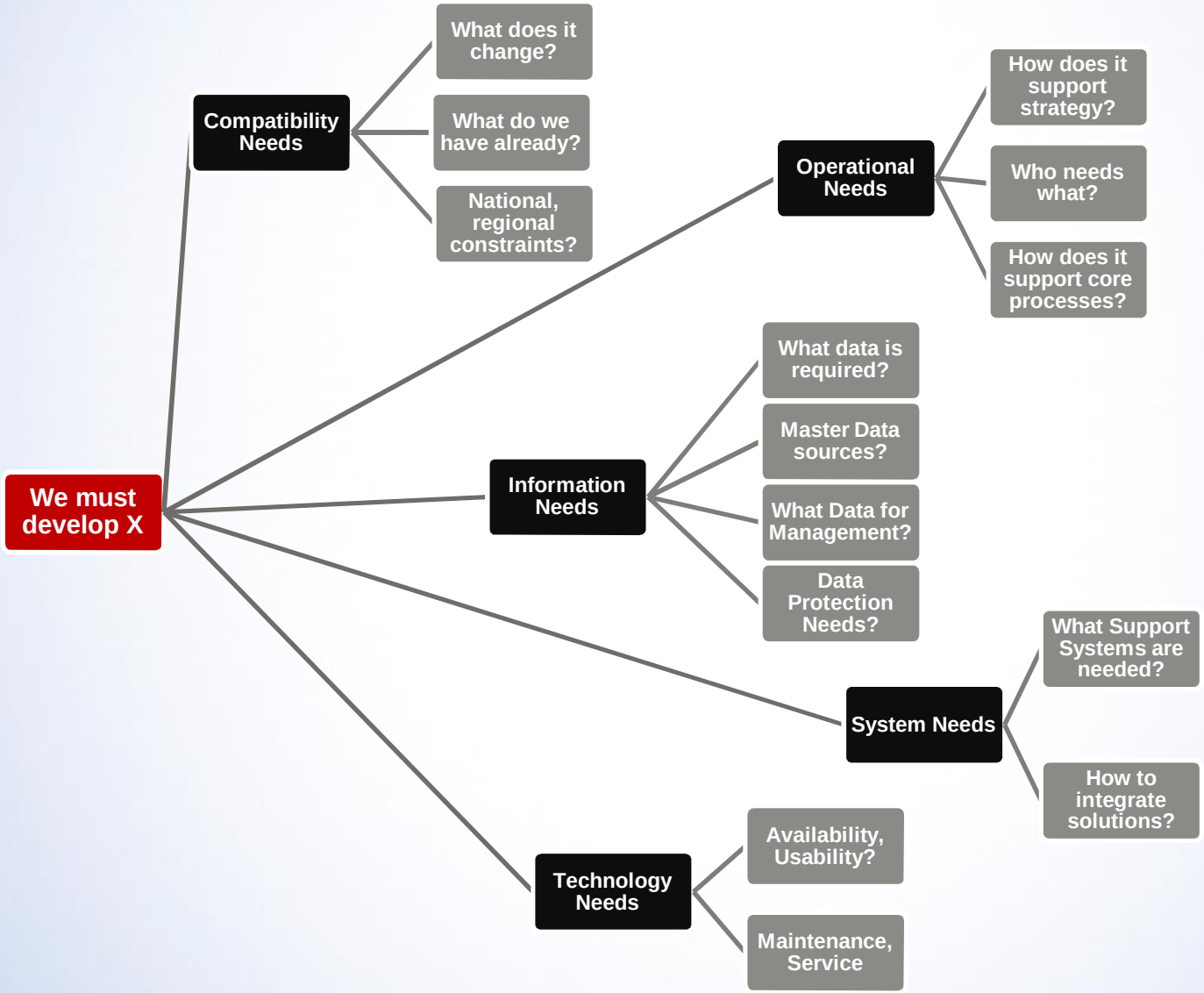
EA Models: TOGAF, Kartturi, JHS-179

- EA is a method for operational development that ensures that IT development is based on the needs of the an organization's core functions and strategy.

EA FRAMEWORK 'KARTTURI'



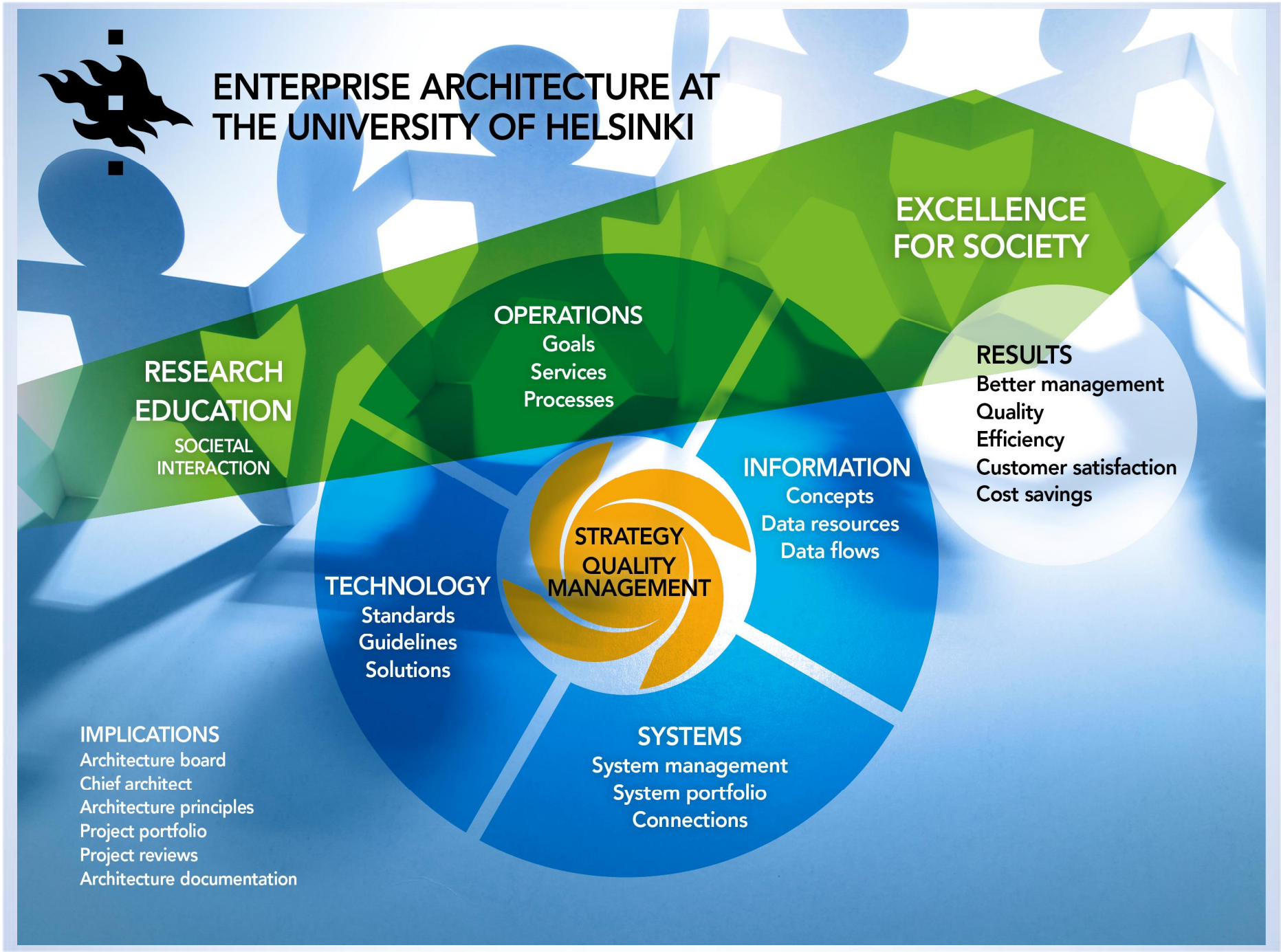
EA VS. DEVELOPMENT NEEDS



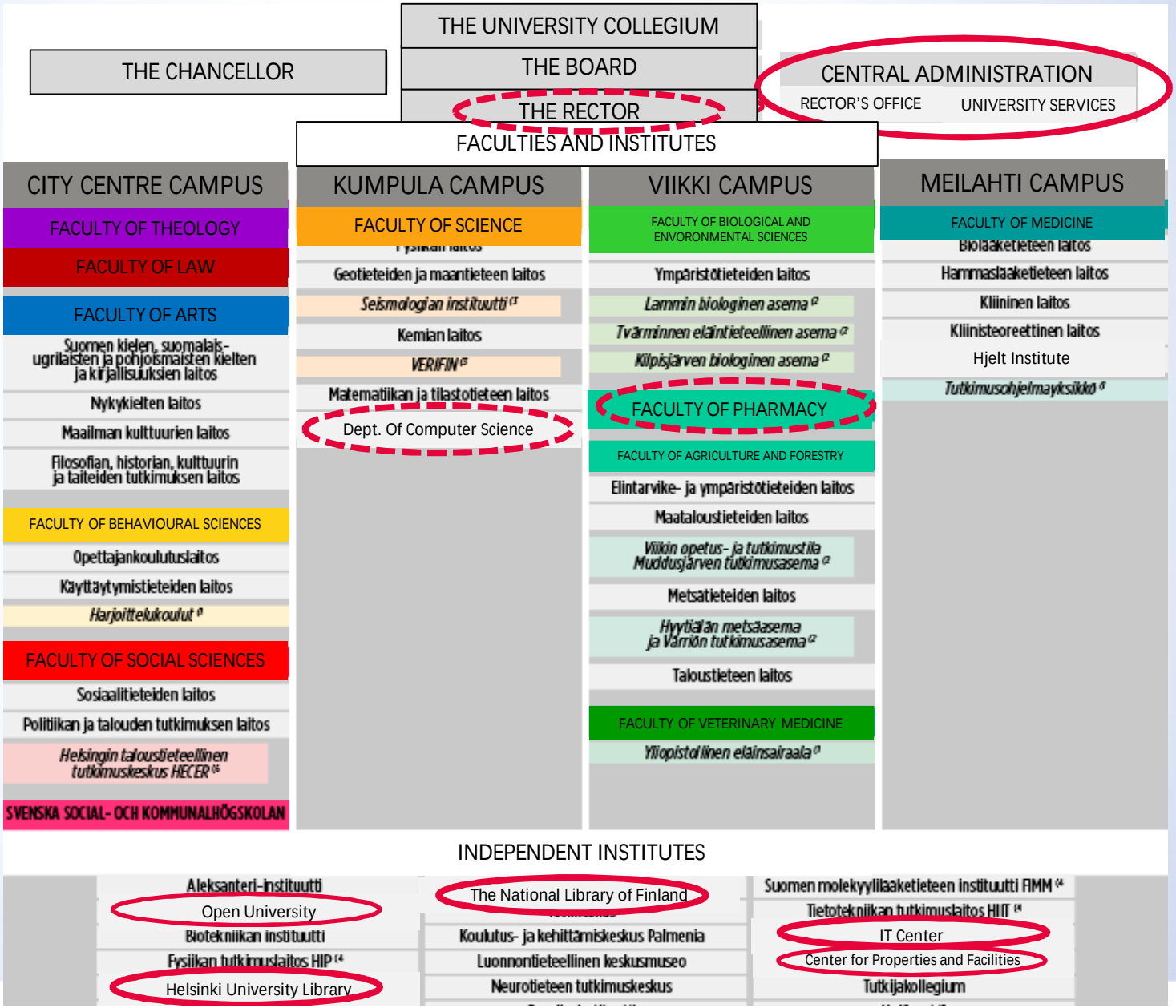
Implementation of the EA Model at the University of Helsinki

EA WORK AT THE UNIVERSITY OF HELSINKI

- The Big Picture
- EA Focus
- A Short History
- EA Board
- EA Principles
- EA Maturity Assessment
- EA vs. Project Management
- Architecture Reviews
- Master Data Management
- EA Costs
- Wrap-Up: the Big Picture of EA at Uni. Helsinki


ENTERPRISE ARCHITECTURE AT
THE UNIVERSITY OF HELSINKI
EXCELLENCE
FOR SOCIETY
RESEARCH
EDUCATION
SOCIETAL
INTERACTION
OPERATIONS
Goals
Services
Processes
RESULTS
Better management
Quality
Efficiency
Customer satisfaction
Cost savings
INFORMATION
Concepts
Data resources
Data flows
STRATEGY
QUALITY
MANAGEMENT
TECHNOLOGY
Standards
Guidelines
Solutions
SYSTEMS
System management
System portfolio
Connections
IMPLICATIONS
Architecture board
Chief architect
Architecture principles
Project portfolio
Project reviews
Architecture documentation

EA WORK FOCUS IN THE UNIVERSITY ORGANISATION



EA Implementation Phases at the University of Helsinki

Year	Results
2006 – 2008	Process Modeling, System Portfolio, Initial EA Work
2009	Architect / Project Manager
	EA Handbook for Institutions of Higher Education. Some EA Modeling.
2010	National-level EA Cooperation of HE Institutions (Raketti Project)
	EA Project: Architecture Vision of the University's Central Administration
	EA Work and EA Group of the Education Services
2011	Project & Project Idea Portfolios implemented. Kartturi EA Model developed.
	IT Center's EA Board, **University-level EA Board started.**
	Implementing the EA model within IT Projects
2012	Use of Kartturi Model. National-level EA Special Interest Group (KA-SIG) for HE Organisations started
	Enterprise Architecture Principles. EA Maturity Check.
2013-2014	EA Reviews, MDM Initiative, Technology Architecture Review, EA Training Program, Implementation of QPR's EA Tool and Repository
2015	New EA Board, Revised EA Principles, EA Modeling, Target Architectures etc.

The EA Board

THE EA BOARD

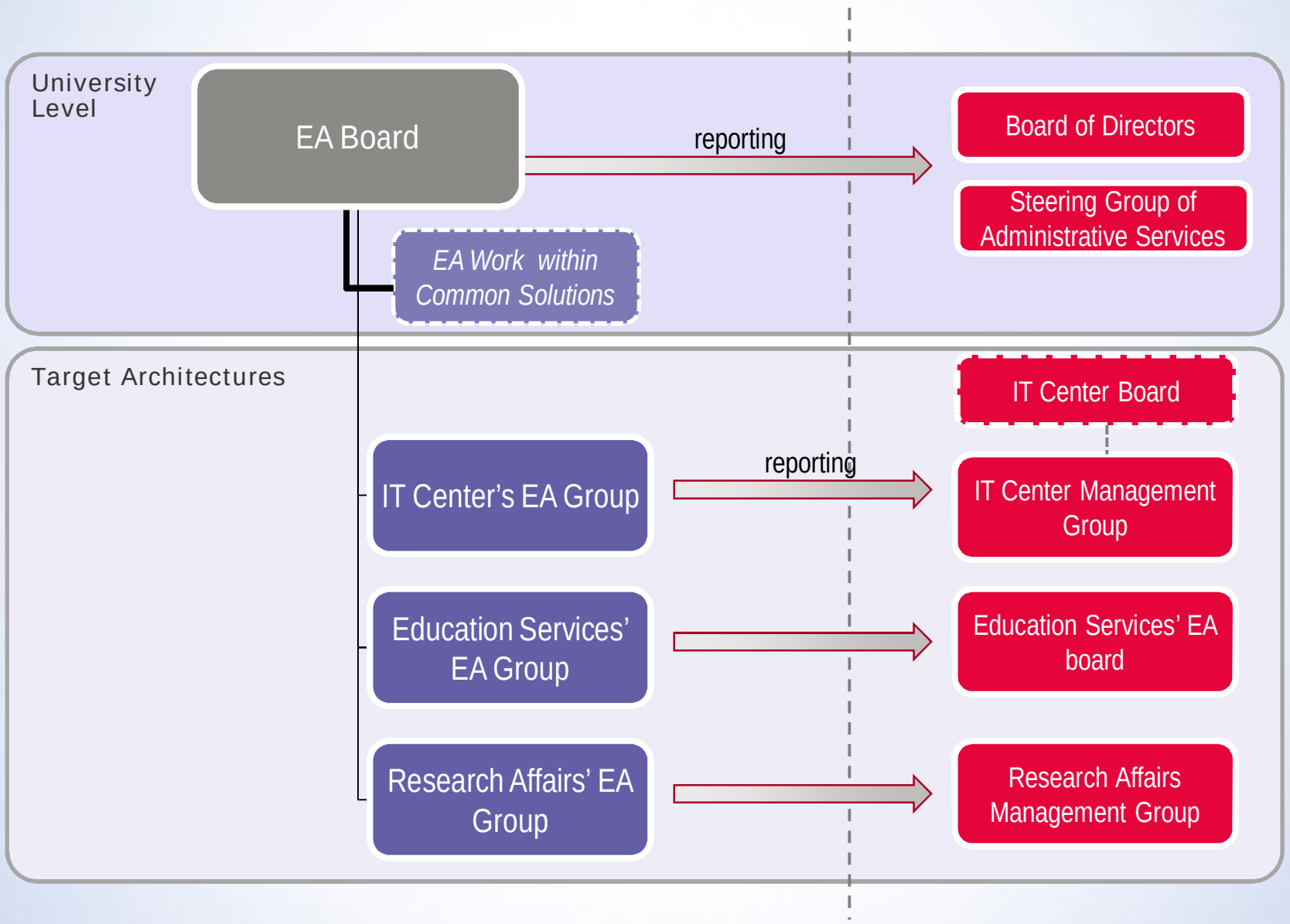
Members:

- Chair: Head of Administration Antti Savolainen
- Central Administration Sectors: 7 Representatives
- IT Center, Center for Properties and Facilities, 3 Representatives
- 3 Faculty Members, 2 Professors
- Meetings 10 times per year

Tasks:

- University-level EA governance
- Preparation of EA guidelines and principles to be ratified by he Rector
- Assessment of the conformity of development projects to EA principles and guidelines
- Follow-up of IT projects and their conformity to EA goals
- Coordination of national and international EA cooperation
- Quality management of EA documentation

EA GOVERNANCE
EA BOARD AND GROUPS



Enterprise Architecture Principles

ENTERPRISE ARCHITECTURE PRINCIPLES

- Architecture principles define the underlying general rules and guidelines for the use and deployment of all IT resources and assets across the enterprise. They reflect a level of consensus among the various elements of the enterprise, and form the basis for making future IT decisions. *(TOGAF).*
- EA Principles can be seen as an organisation's internal EA legislation. All EA development is based on the principles.
- EA principles describe a common view of measures that can be used to develop ICT solutions to support the University's core activities and strategy.
- EA principles are mandatory; any exceptations must be justified
- UH's set of EA Principles are based on those of the Finnish public sector and Higher Education sector.
- Format from TOGAF: Name, Statement, Rational, Implications
- No prioritization of EA principles.

Enterprise Architecture Principles at the University of Helsinki

Group	Principle
General	1. Enterprise Architecture methodology is used in all IT development
	2. The development of IT systems is based on openness
Business	3. Enterprise Architecture serves the University's core activities
	4. Enterprise Architecture serves the University's strategy
	5. Unified methods and solutions are used in common functions all over the university
Information	6. Information management and IT systems are based on common concepts and vocabulary
	7. Data is shared
	8. Data security and data protection during the whole life cycle of the data/system
	9. Data trustees accountable for data quality
System	10. Interoperability of systems
	11. System compatibility
	12. Ease-of-use of applications
	13. Technology independence of systems
Technology	14. Consistent technology architecture
	15. Technology choices are based on the maturity of technologies
	16. Technology choices are based on environmental sustainability requirements

Enterprise Architecture principles: experiences

+ EA principles are a necessary, if not a sufficient tool to enable EA work
+ EA principle creation process is a good way to start EA Governance and EA Board's work
+ A good method to get management support
+ EA principles enable introduction of EA, enhances communication
+ EA principles help the assessment of development projects' conformity to strategy, core processes etc.

- Might seem a bit theoretical; what are the real benefits?
- Some principles have proven somewhat problematic/far-fetched:
  - Technology independence
  - Consistent technology architecture
  - Environmental sustainability

EA Maturity Assessment

EA MATURITY ASSESSMENT

- Government EA assessment model
- Based on the common Capability Maturity Model (CMM). Also Nascio Architecture maturity model has been applied (*National Association of State Chief Information Officers)

Level 5: Strategic/Optimized: Architecture is a strategic tool for management and planning.

Level 4: Managed: Architecture and EA Governance is measured regularly, the results are analyzed and corrective steps are taken.

Level 3: Defined: Standard procedures and models are used in EA development. EA activities are organized.

Level 2: Repeatable: Some EA Governance processes, organisation, and tools are used.

Level 1: Initial: EA Governance processes or organisation are not defined.

EA MATURITY ASSESSMENT

- Excel Spreadsheet
- Eight areas, five levels (1-5), 97 items total:
  - 1: Architecture Documentation, 13 items
  - 2: EA method 13
  - 3: Governance Processes, 12
  - 4: Development and Implementation, 13
  - 5: Organisation, 11
  - 6: EA Skills, 9
  - 7: Support for Core Operations, 15
  - 8: Compatibility, 11
- Comparison to earlier assessment(s)

EA MATURITY ASSESSMENT

Results 2012-2013

Area	2013	2012	Difference
Documentation	**2,07**	1,97	0,1
Method	**1,87**	1,73	0,15
Processes	**1,70**	1,53	0,17
Development	**1,33**	1,37	0,04
Organisation	**1,61**	1,53	0,08
EA Skills	**2,00**	1,5	0,50
Core oper. support	**2,08**	1,98	0,10
Compatibility	**2,08**	1,73	0,35
Average	**1,85**	1,67	0,18

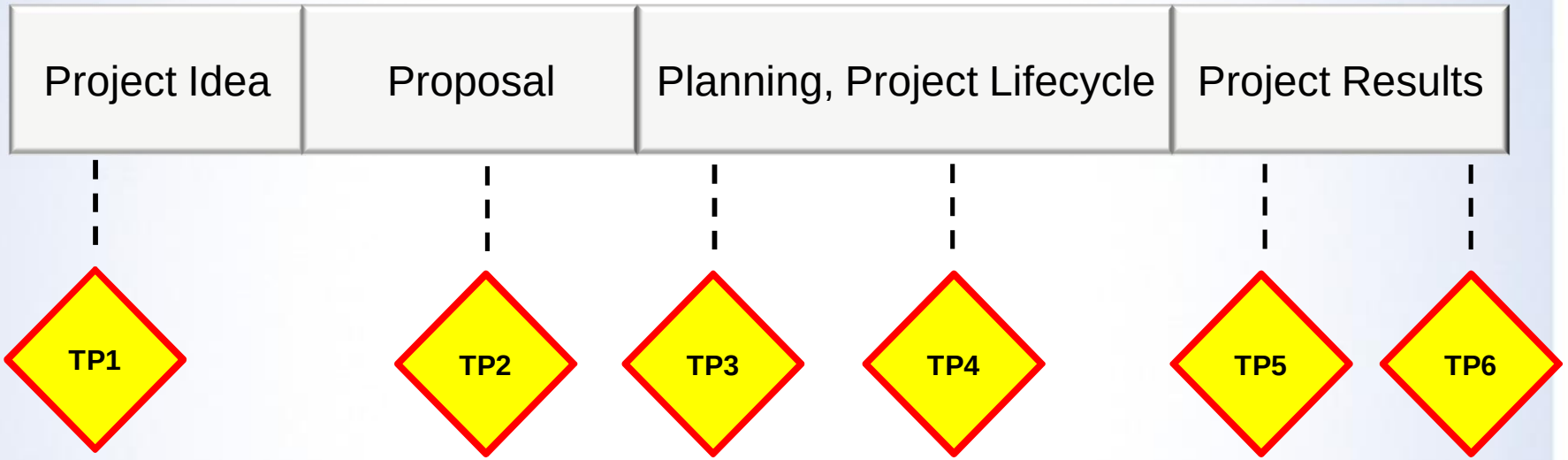
EA and Project Management

ARCHITECTURE REVIEWS OF IT PROJECTS

- Six evaluation points during the IT projects' life span have been defined to assess their EA compliance
- Different questions are asked in different phases, for example compliance to EA principles or the defined target architecture
- The assessment is made by neutral reviewers outside the project organisation
- The University's EA Board will accept the results of the EA reviews
- Olso other project features can be reviewed, such as project management, data security, usability, reporting needs.

ARCHITECTURE REVIEWS OF IT PROJECTS

Project Phases



Project Idea/Proposal

EA Reviews

TP1: Project Idea
TP2: Project Proposal
TP3: Project Plan
TP4: RFP Evaluation
TP5: Project Results
TP6: Implementation

Summary Report

EA REVIEWS: PROJECT PROPOSALS VS. EA PRINCIPLES

Projects 2014 EA Review

Nro	Project		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	EA Principles:		1. Enterprise Architecture methodology is used in all IT development	2. The development of IT systems is based on openness	3. Enterprise Architecture serves the University's core activities	4. Enterprise Architecture serves the University's strategy	5. Uniform methods and solutions are used in common functions all over the university	6. Information management and IT systems are based on common concepts and voca	7. Data is shared	8. Data security and data protection during the whole life cycle of the data/system	9. Data trustees accountable for data quality	10. Interoperability of systems	11. System compatibility	12. Ease-of-use of applications	13. Technology independence of systems	14. Consistent technology architecture	15. Technology choices are based on the maturity of technologies	16. Technology choices are based on environmental sustainability requirements
1	Project 1		M	E	M	E	M	E	M	E	M	E	M			M		
2	Project 2		M	M	E	M	E	M	E	M	E	M	E	M				
3	Project 3		M	M	M	E	M	E	M	E	M	E	M	E	M	M	M	
4	Project 4		M	E	M	E	M	E	M	E	M	E	M	M	E	M		
5	Project 5		M	M	E	M	E	M	E	M	E	M	E	M	M	E	M	
6	Project 6		M	M	M	E	M	E	M	E	M	E	M	E	M	M	E	M
7	Project 7		M	E		M	E	M	E	M	E	M	E	M	E	M	V	
n	Project n		M	M		M	E	M	E	M	E	M	E	M	E	M		

E = promotes the EA principle
M = supports the EA principle
V = does not support the EA principle

EA REVIEWS: PROJECT PROPOSALS VS. STRATEGY

Projects 2014		Strategic Objectives / Development Areas															
		A 1-2	B 3-4	C 5-7	D 8-9	E 10-11	F 12-15	G 16-18	H 19-21	I 22-23	J 24-25	K 26-28	L 29-30	M 31-34	N 35-37	O 38-39	
Nro	Project																Strategic Development Areas Supported
1	Project 1											M					26,28 also 27?)
2	Project 2			M		M		E	E			M					16-18, 19-21,
3	Project 3					M						M					10, 28
4	Project 4		M		M	M		E	E	M		E					4, 8, 11, 16, 18, 19, 21, 22, 26, 27, 28
5	Project 5	M															1, 2
6	Project 6											M			M		26, 35
7	Project 7											M					26,27,28
n	Project n																

E = develops the strategic development area
M = supports the strategic development area
V = negative effect to the strategic development area

Master Data Management

MASTER DATA MANAGEMENT

- Master data represents the business objects which are agreed on and shared across the enterprise
- Master data is the most widely used and important data within the organisation and its processes
- Typical features of master data
  - Contains necessary data of the whole organisation
  - There should be a consistent view to master data throughout the organisation
  - Master data is used by a number of different processes and organisation units
  - Master data is typically updated at a slow frequency
  - Poor quality or many distributed copies of master data will cause problems in reporting etc.

MASTER DATA MANAGEMENT

As-Is:

System X

Kimi Räikkönen
171079-9999

System Y

KimiRaikkoinen
17.10.79

?

System Z

Kimi-Matias Räikkönen
171079-XXXX

System n

Kimi Raikkonen
Soc.sec.nr??

To-Be:

Person Data master

Kimi Räikkönen
171079-1234

Integration Service

System X

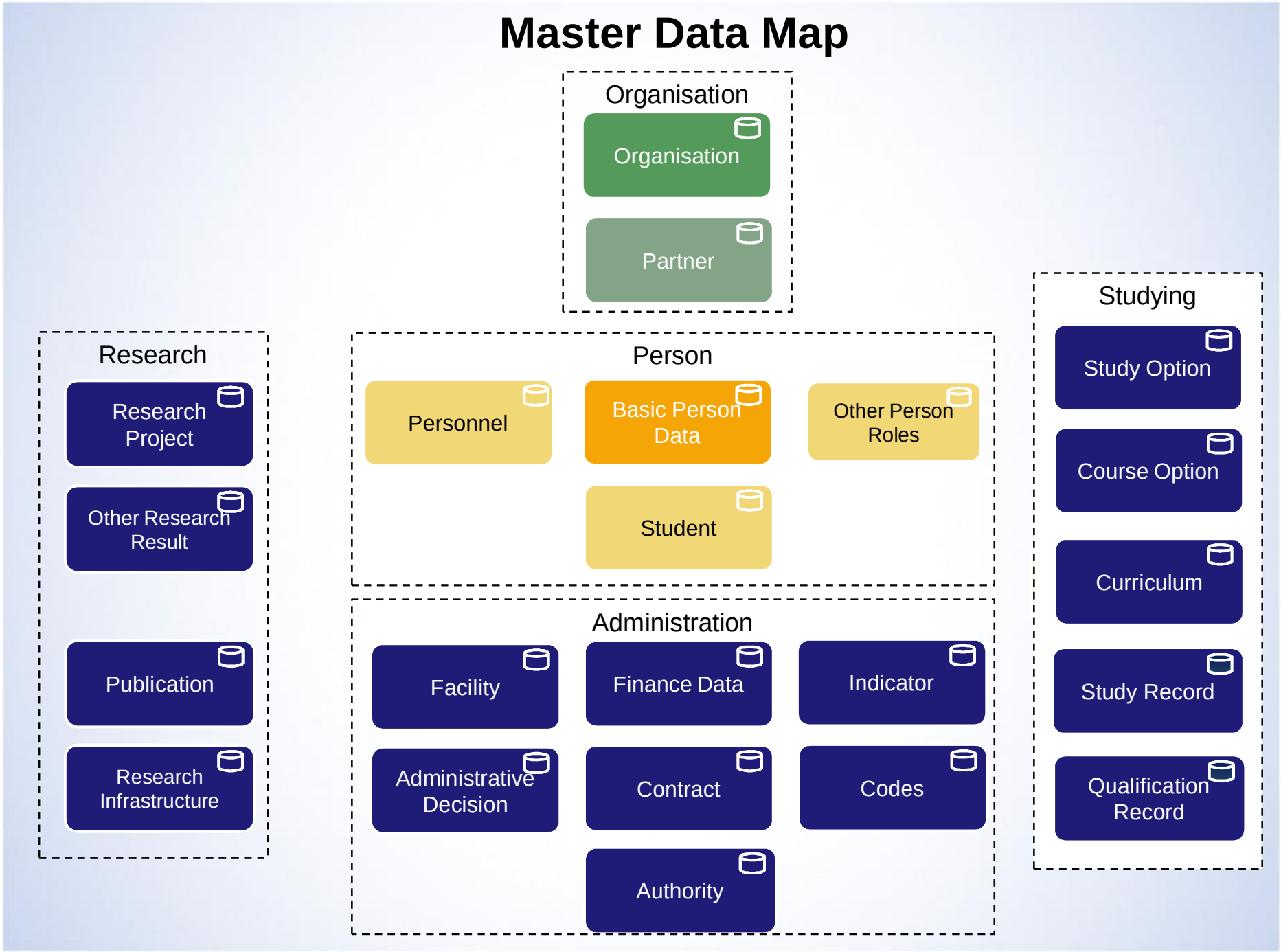
System Y

System Z

System Å

System n

Master Data Map



MASTER DATA MODEL

Master Data Governance; Responsibilities and MDS Systems

Main Class	Master Data	Owner	Responsible	Master Data Source
Administration	Finance Data	Financial Affairs	[n.n.]	[system]
	Indicator	Strategic Planning and Quality Assurance		
	Administrative Decision	Administrative Affairs		
	Contract	Administrative Affairs		
	Codes	IT Center		
	Facility	Center for Properties and Facilities		
	Authority	IT Center		
Organisation	Internal Organisation	Administrative Affairs		
	Partner	Communications and Community Relations		
Person	Person Basic Data	IT Center		
	Personnel	Human Resources and Legal Affairs		
	Student	IT Center		
	Other Person Role	IT Center		
Studying	Study Options	Education Services		
	Curriculum	Education Services		
	Course Option	Education Services		
	Study Record	Education Services		
	Qualification Record	Education Services		
Research	Research Project	Financial Affairs / Research Affairs		
	Other Research Result	Research Affairs		
	Publication	Library / Research Affairs		
	Research Infrastructure	Research Affairs		

MASTER DATA MODEL

Master Data Card

Name	[Name of Master Data Item]	
Description		
Owner	[Organisational Unit]	
Responsible	[Person]	
Data	[Description of Data]	
Data Security		
Data Lifecyle	Initiation	
	Use	
	Deletion	
Data Quality Management		
Master Data Source (MDS)	[System]	
Notes		

EA Costs

EA-RELATED COSTS

- **Difficult to define, as much of the work would have been done anyway**

- **Some Cost Items:**
  - **Own Work: ca. 1 FTE from start + 20 % increase a year, currently max. 3 FTE (???)**
  - **EA Consulting, € 15k p.a.**
  - **EA Courses and Training, € 5k p.a.**
  - **QPR EA Tool, € 20k + Some License/Support Fees**

What’s Next?

CURRENT AND FUTURE EA WORK

- **Research Affairs: Target Architecture**
- **Societal Interaction: Target Architecture**
- **Technology Architecture; As-Is, To-Be Architectures**
- **QPR Enterprise Architect Tool: Implementation + Conversion of Excels, Powerpoints etc.**
- **New EA Board 2015-**
- **Revision of EA Principles?**
- **EA vs. Strategy Work 2015-2016**
- **…**

Wrap-Up: Lessons Learned & Recommendations

EA AT THE UNIVERSITY OF HELSINKI LESSONS LEARNED

- **EA= A method aiming at the best possible IT system solution to support the University's core functions**
- **EA is a target-oriented 'way of life' and a mindset**
- **EA itself is not a project, but rather a process**
- **EA program requires skilled resources**
- **EA modeling requires time and resources**
- **EA does not offer ready answers but helps to *ask the right questions at the right time*.**
- **EA is a protocol, a communication tool that enables different organicational unit to develop operations and IT systems together**
- **The use of the EA method should not increase workload because the work should be done anyway. EA just brings about a sophisticated method to do it.**

STARTING EA WORK IN A HE INSTITUTION; RECOMMENDATIONS

- Define EA Goals; Short/Long Term
- Communicate; Emphasize Results, Not Concept
- Get Sponsors/Commitment from:
  - IT, IT Management
  - Administration
  - Business Management
- Organise; EA Board, EA Governance etc.
- Get EA Skills, Training
- Get Support; Consultancy, Peer Support
- Create EA Principles
- Measure Progress with Regular EA Maturity Checks
- Document
- Define The ’EA Big Picture’
- Get Networked

THANK YOU

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