EIRICT KICKOFF

March 6, 2012

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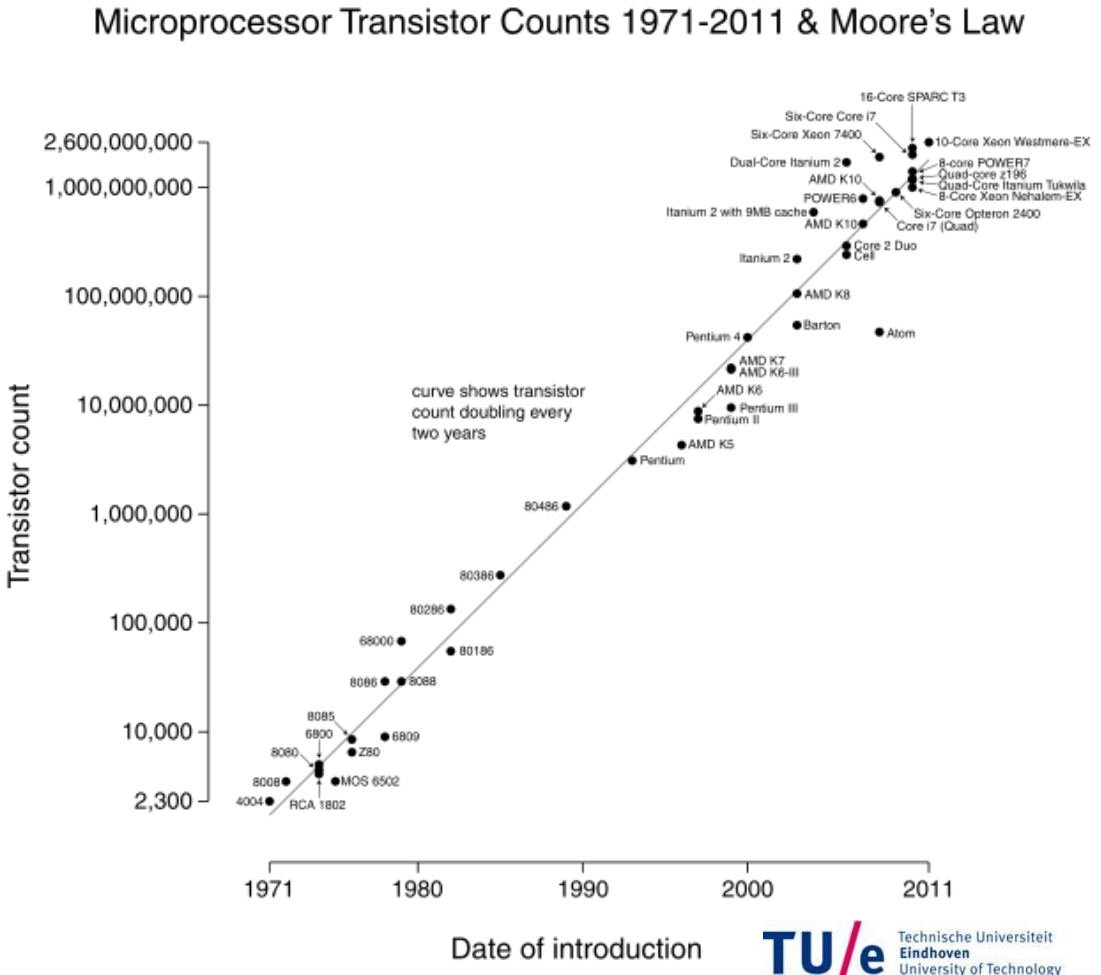
TU/e Technische Universiteit Eindhoven University of Technology

Eindhoven Institute for Research on ICT

The business of exponential growth

- Moore's law
  - # transistors / area doubles every two years
  - (… at the same price)



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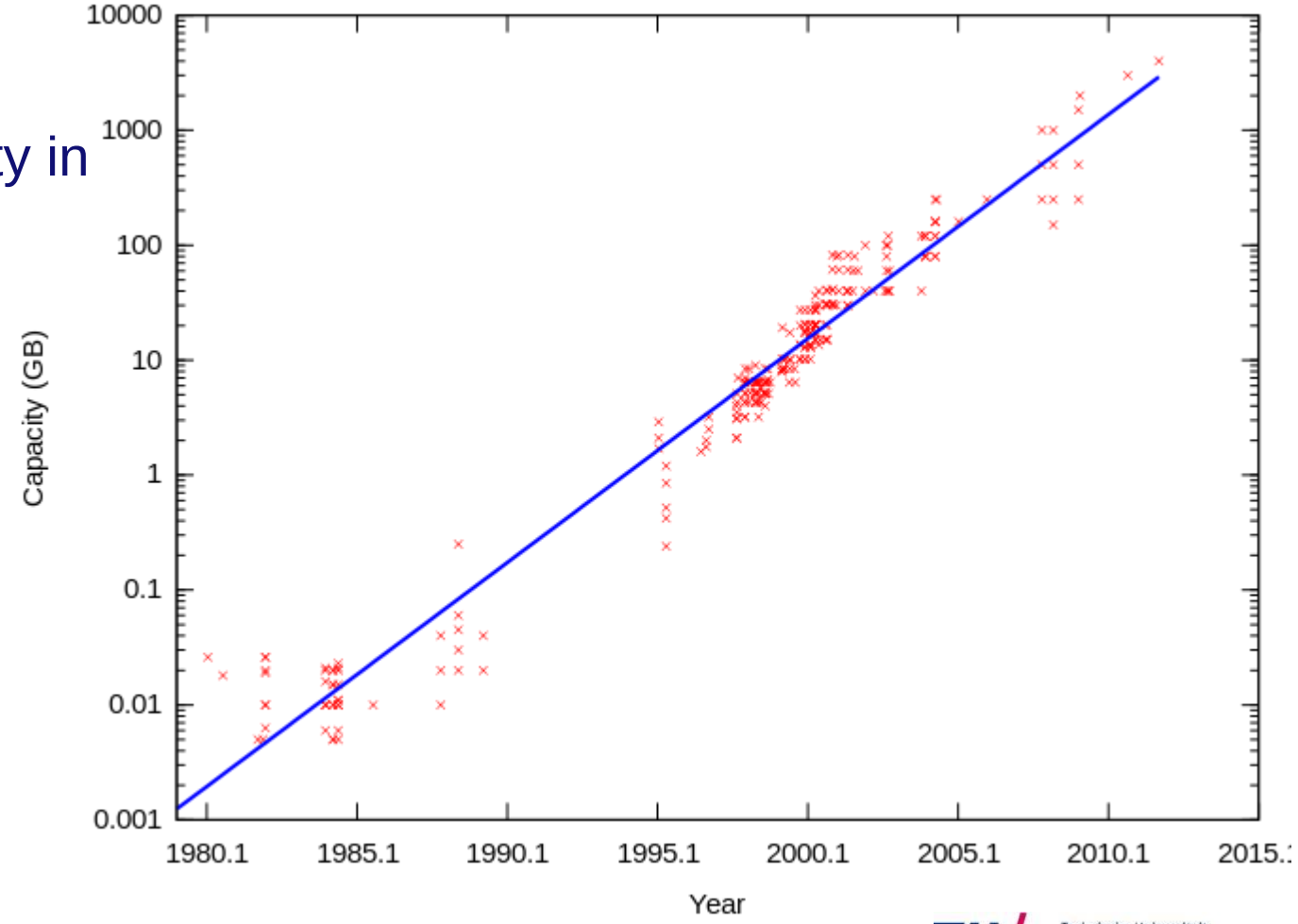
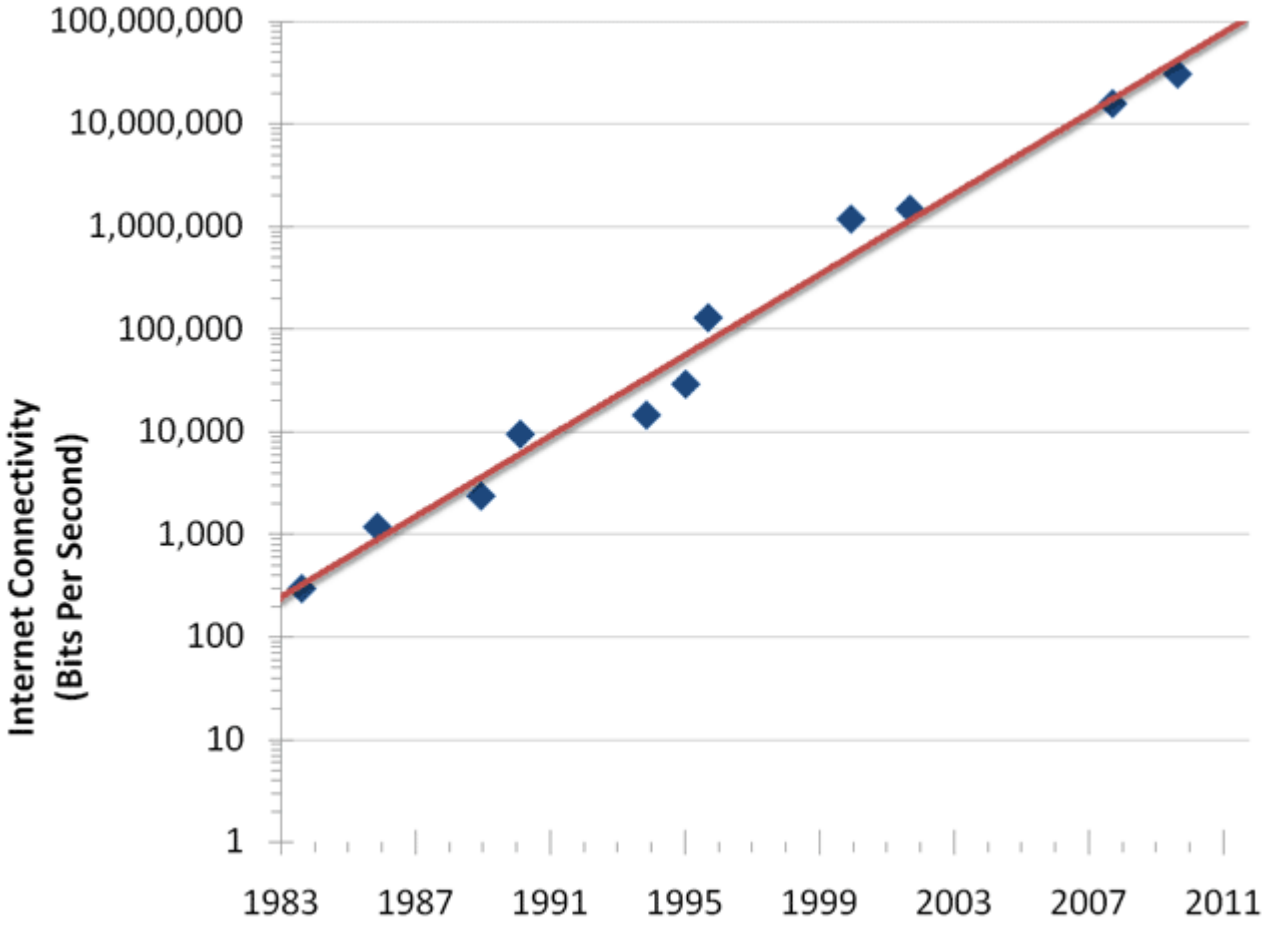
The business of exponential growth

- Kryder's law
  - storage capacity in # bits / surface doubles every 18 months
  - 14TB @ $40 in 2020



The business of exponential growth

- Nielsen's law
  - a high-end-user's connection speed grows by 50% annually



The business of exponential growth

- Gilder's 'law': the total bandwidth of the Internet triples every year

- Metcalfe's 'law': the value of a (telecommunication) network is proportional to the square of connected users

wow!

TED talk Peter Diamandis: Abundance is our future

Progress over the past 100 years:

Average human lifespan: ↑ 2x

Avg. per-capita Income: ↑ 3x

Childhood Mortality: ↓ 10x

Cost of Food: ↓ 10x

Cost of Electricity: ↓ 20x

Cost of Transportation: ↓ 100x

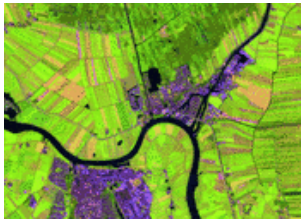
Cost of Communications: ↓ 1000x

Technologies riding Moore's Law

1. Infinite Computing
2. Sensor & Networks
3. Robotics
4. 3D Printing
5. Synthetic Biology
6. Digital Medicine
7. Nanomaterials
8. Artificial Intelligence

ICT – position

- ICT is everywhere
  - (features of) physical products, new processes, new services and interactions
  - digitization of signals, media
  - extensive data generation, and processing



water management, crop prediction via analysis of satellite images

- ICT propels innovations in virtually every application domain
  - innovation ***with*** ICT…..
  - ….from innovations ***on*** ICT

ICT in NL responsible for

5%	of GDP (30BE)
20%	of economic growth
70%	of innovation
31%	of all R&D (2BE)
250000	jobs

(source: ICT roadmap 2011)

- ICT has a broad scope
  - digital circuits, systems, networks, software, interaction technology
  - signals, data and information processing, algorithms
  - modeling, design methods, theory

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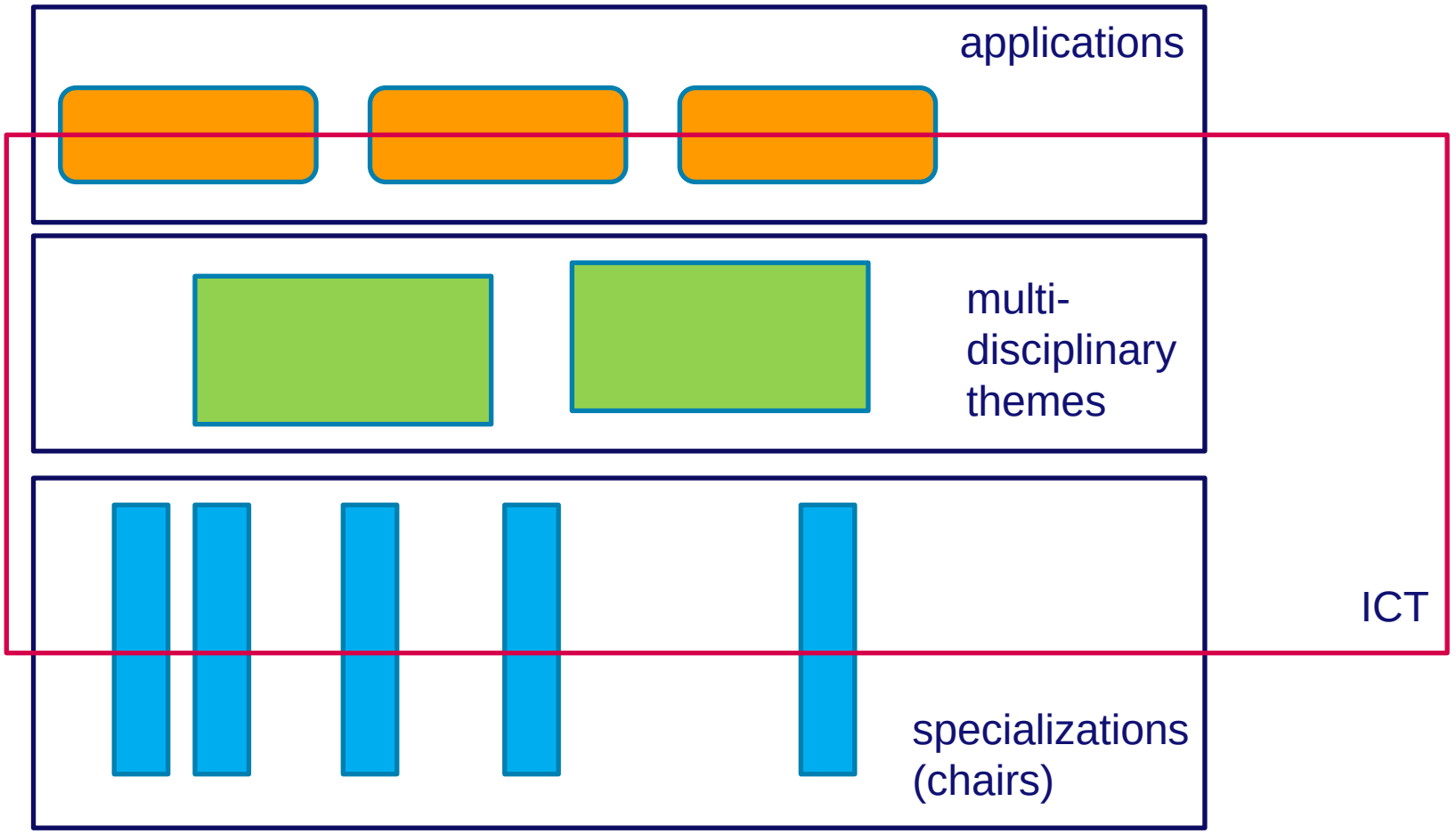
ICT – organization



Observations

- Though advances in ICT are essential for innovation…
  …it has proven to be difficult to give ICT research a recognizable face

- Approaching ICT research just from application domains has pitfalls
  - limitation to ICT *of today* by just applying ICT
  - ignoring the *multidisciplinary nature* of ICT themes
  - lack of *sharing across applications*, danger of *multiple development*

- Hence,
  - recognize *multidisciplinary themes* within ICT
  - organize *collaboration* around these themes

  - Example: Intelligent Lighting Institute
    - 6 faculties collaborate on the application of lighting
    - …around several multidisciplinary themes

ENVIRONMENT of ICT @ TU/e

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Environment of ICT @ TU/e

Concerns and opportunities

- Government: reductions and reallocations in research funding

- Scalability
  - #contacts ~ #external institutions · #groups?
  - competition (increasing numbers of competing institutions)
  - selecting the most efficient channel to approach a topic

- Being recognizable on ICT themes (by industry and government)

- Programs increasingly driven by societal challenges and industrial needs
  - EU programs
  - industry-driven research through the topsectors roadmaps
  - requires *multidisciplinary collaboration, domain knowledge* (across disciplines) in addition to *specialized knowledge*

Dutch topsector policy

ICT roadmap + separate innovation contract

Roadmaps, innovation contracts

ICT Roadmap (NIRICT, IPN, TNO)

- Identifies (multidisciplinary) ICT themes for topsector roadmaps, e.g.
  - *Dependable (trustworthy)* ICT
  - ICT for *monitoring* and *control*
  - ICT for a connected world
  - Big data (generation, analysis, exploration)

- Supported explicitly by 129 companies!

- http://www.ictonderzoek.net/?m=456

EIRICT

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EIRICT

3TU
Netherlands Institute for
Research on ICT

DIRECT

Delft

CTIT

Twente

EIRICT

ICT @ TU/e

~ 50 chairs
4 faculties + 3

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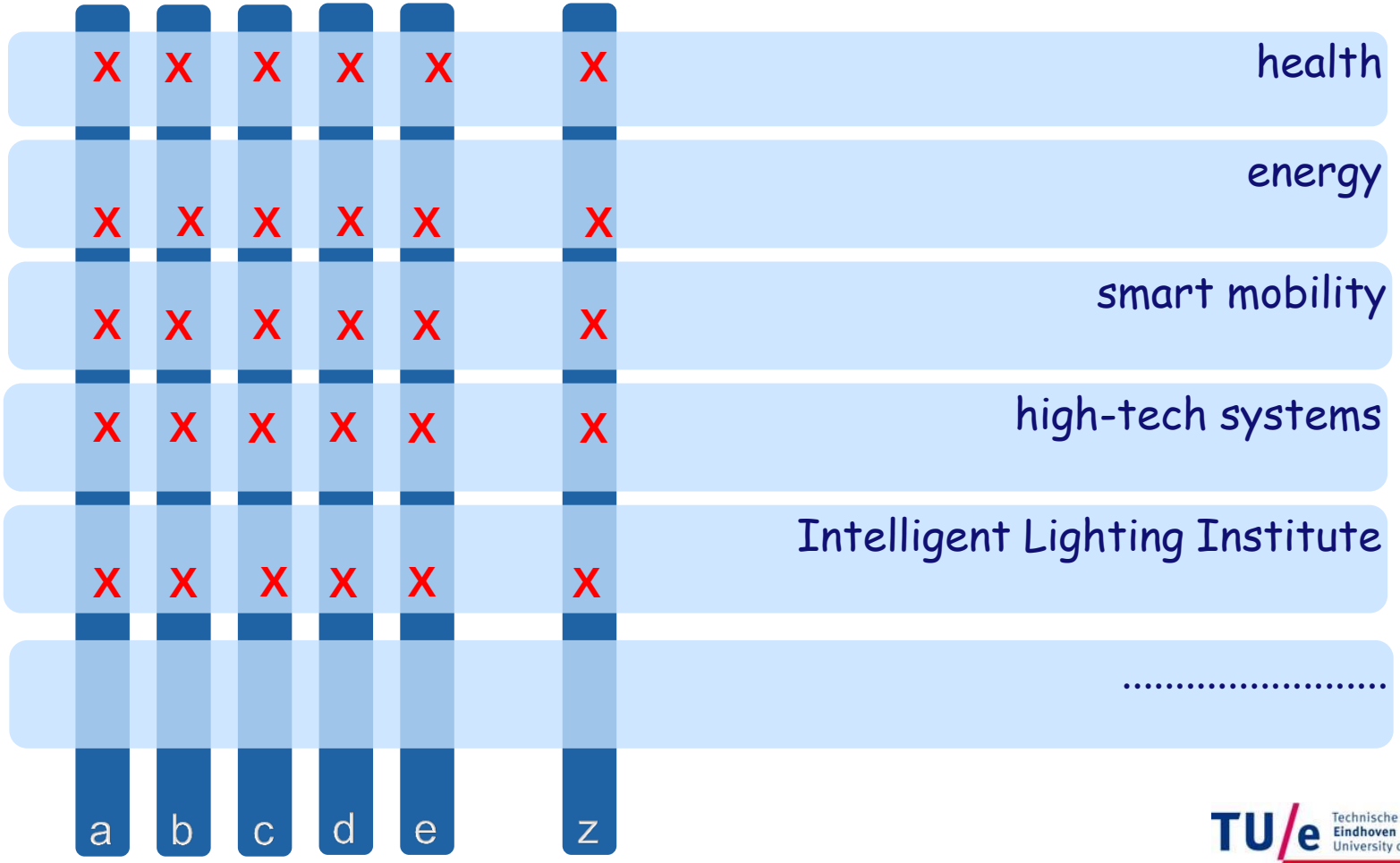
EIRICT Goals (sept '11)

- Increase *impact* and *recognizability* of ICT @ TU/e
  - clear profile for ICT @ TU/e
  - ICT participation within TU/e SRAs

> *What can the ICT research community contribute to the strategic areas of the TU/e?*
>
> and
>
> *Which challenges do the strategic areas pose to ICT research?*

  - improve collaboration, financing, valorization
    - EU, EIT ICTlabs, industry, institutes
  - become *leading* in some ICT topics

Collaboration within TU/e



chair/research group of EIRICT

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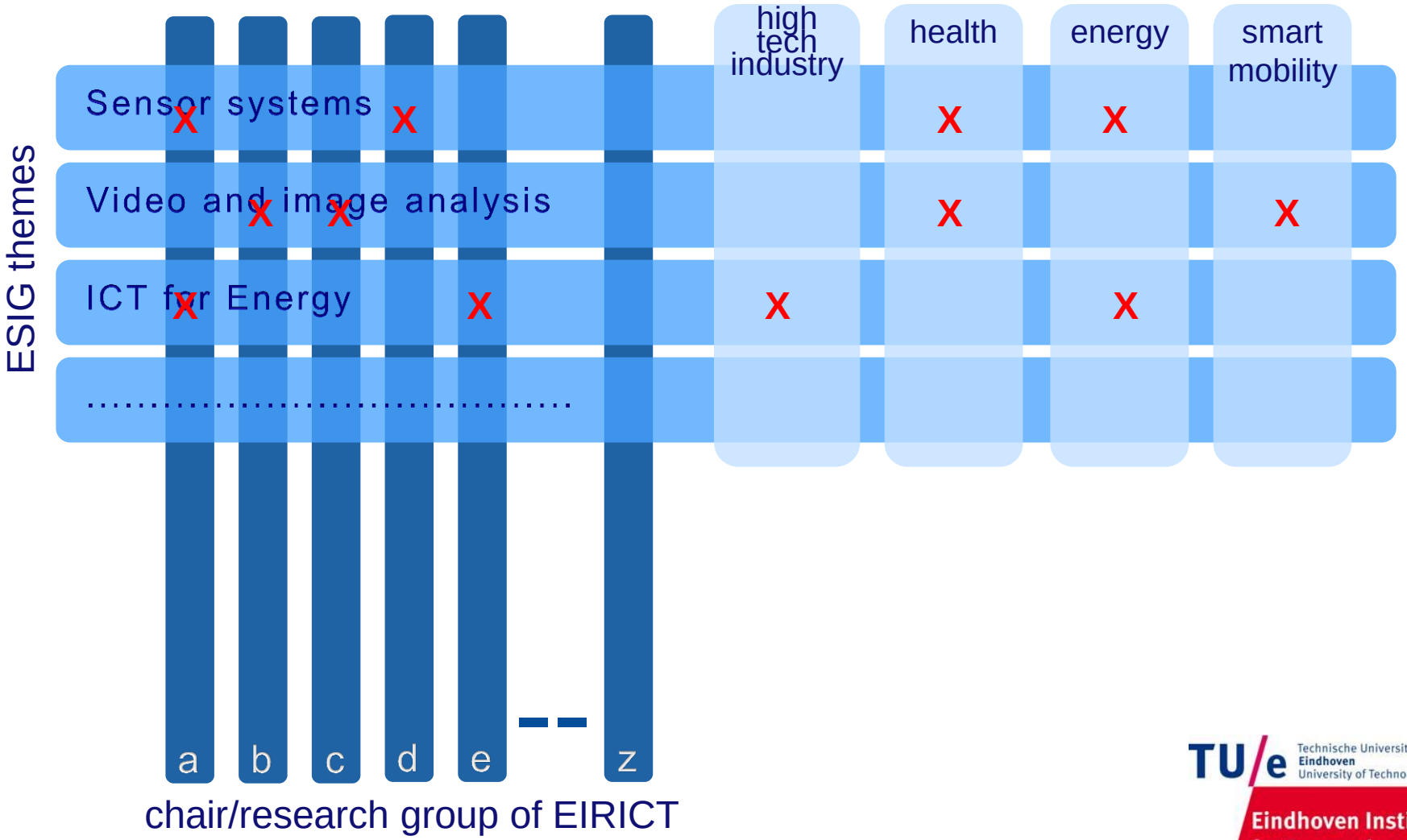
EIRICT: setup

- ICT Research in multidisciplinary ICT themes
  (called **ESIG**s, “EIRICT special interest groups”)
  - Strengths of ICT @ TU/e
  - Multiple faculties
  - Conformant to ICT roadmap in NIRICT and topsectors
  - Applicable to strategic areas
  - Externally recognizable
- Eight ESIG themes selected
- First meetings have taken place

Sensor systems
Image and video analysis
Robotics
Future Internet (networks of the future)
Trustworthy (dependable) systems
ICT for Energy
Big data (open data)
Connected car

EIRICT: structure



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PLANS

Setting up ESIGs

- Develop a ~5 year vision and corresponding research plan on the ESIG theme
  - series of low-overhead discussions in a small team…
    - resulting in a preliminary multidisciplinary position description, and plan
  - ….followed by forming a wider group

- ESIG regular meetings
  - planning, discussing and sharing a research agenda, project proposals, education

- Goals
  - community formation, ‘expertise center’
  - become ‘access’ point
    - for external contacts, strategic areas
    - for project consortia

Projects

- Follow up on ICT calls (Europe, national)
  - proposing new projects
  - setting up consortia
  - (sometimes): help in writing proposals
  - (eventually): take part in defining the calls
- Projects with local government, industrial partners, KICs
- Working with Strategic Areas, ILI
- We need the ESIGs
  - for making propositions, to show TU/e expertise
  - and for providing research direction

Public activity

- Setting up a website, around the ESIGs
  - perhaps including news and agenda
  - email newsletter
- EIRICT LinkedIn group and EIRICT group within TU/e Yammer
  - become a member!
- Representing TU/e on ICT issues, e.g.,
  - organizations (e.g. NIRICT, EIT ICT labs)
  - topsector discussion
- Symposia, associated with EIRICT subjects

EIRICT organization

- *Virtual (network) organization*

- Financed until September 2015
  - contribution from University Board and participating faculties
  - director (0,5), program officer (1,0), secretary (0,1)
  - current team: *Johan Lukkien, Peter van Otterloo, Harold Weffers, Anjolein Gouma*

- EIRICT board
  - rector + deans of W&I, EE, IE&IS, ID

- Internal board of advice (‘klankbord’)
  - 5 EIRICT chairs: *Jack van Wijk, Jan Bergmans, Maarten Steinbuch, Paul Grefen, Matthias Rauterberg*

Finally,

- EIRICT – that is us here!
- I will try my best – thanks for the trust in me to shape EIRICT
- We solicit your views and inputs through two statements on a card. Pleas discuss, fill in and leave outside or with any of us.