eResearchSA 2013: Redesigning infrastructure to accommodate research and …

André le Roux

Information and Communication Technology Services
University of Cape Town
9 October 2013

ASAUDIT
Association of South African University Directors of Information Technology

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Outline

- Herding cats … who's perspective
- In support of research: A time line
- University value chain (UCT)
- People, process and technology
- Some challenges ahead
- Resourcing
- An architectural perspective
- Gartner market clock 2013
- Infrastructure
- Researchers want and don't want …

Herding cats … Who's perspective?

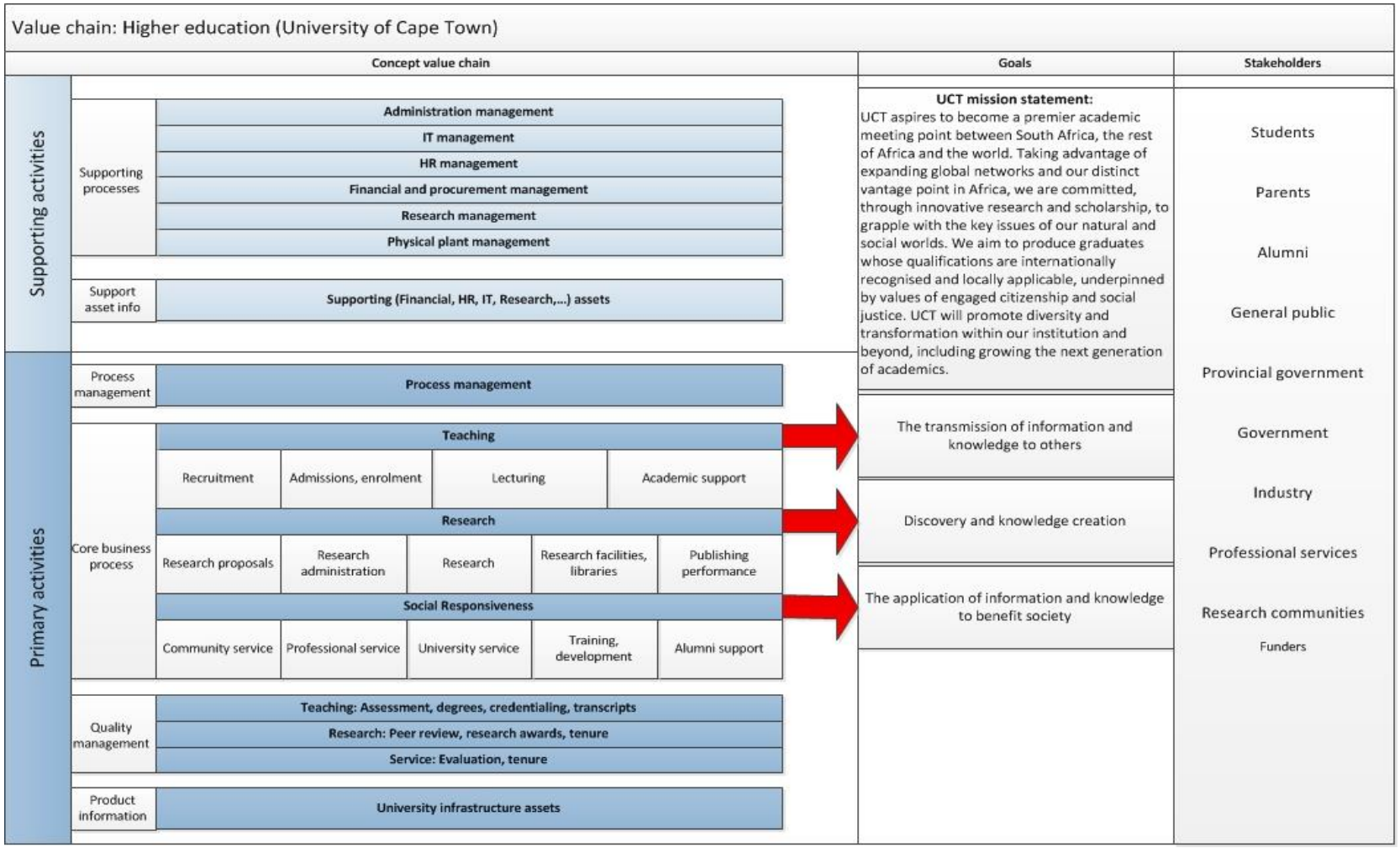
Taken from Furious Diaper (2013)

- Research?
- Teaching & Learning?
- Administration?
- IT?

In support of research: A time line

Taken from Sakkie janse van Rensburg (2013)

University value chain (UCT)



Composite value chain for the University of Cape Town

Source: Adapted from Liss and Warner (2007)

People, Process & Technology

- **" … *computational systems, data and information management, advanced instruments, visualization environments, and people, all linked together by software and advanced networks to improve scholarly productivity and enable knowledge breakthroughs and discoveries not otherwise possible*." (IU, 2013)**
- ***" … the (rapid) evolution of research methodologies enabled by information technologies and tools. It is a fundamental step change in the research process*." (Hines , 2011)**
- **"*… IT infrastructure is the base foundation of budgeted-for IT capability (both technical and human) shared throughout the business in the form of reliable services that are centrally coordinated*." (Weill et al, 2002)**
- **" *…is used to refer to the application of advanced information and communication technologies to the practice of research. It enhances existing research processes, making them more efficient and effective, and it enables new kinds of research processes*." (INTERSEC, 2013)**

People, Process & Technology cont.

- **“ …** *computational systems, data and information management, advanced instruments, visualization environments,* **and *people,* all linked together by** *software and advanced networks* **to improve *scholarly productivity* and enable *knowledge breakthroughs and discoveries* not otherwise possible.” (IU, 2013)**

- ***“ … the (rapid) evolution of research methodologies enabled by*** *information technologies* ***and tools. It is a fundamental step change in the research process.” (Hines , 2011)***

- **“…** *IT infrastructure* ***is the base foundation of budgeted-for IT capability (both*** *technical* ***and human) shared throughout the business in the form of reliable services that are centrally coordinated.” (Weill et al, 2002)**

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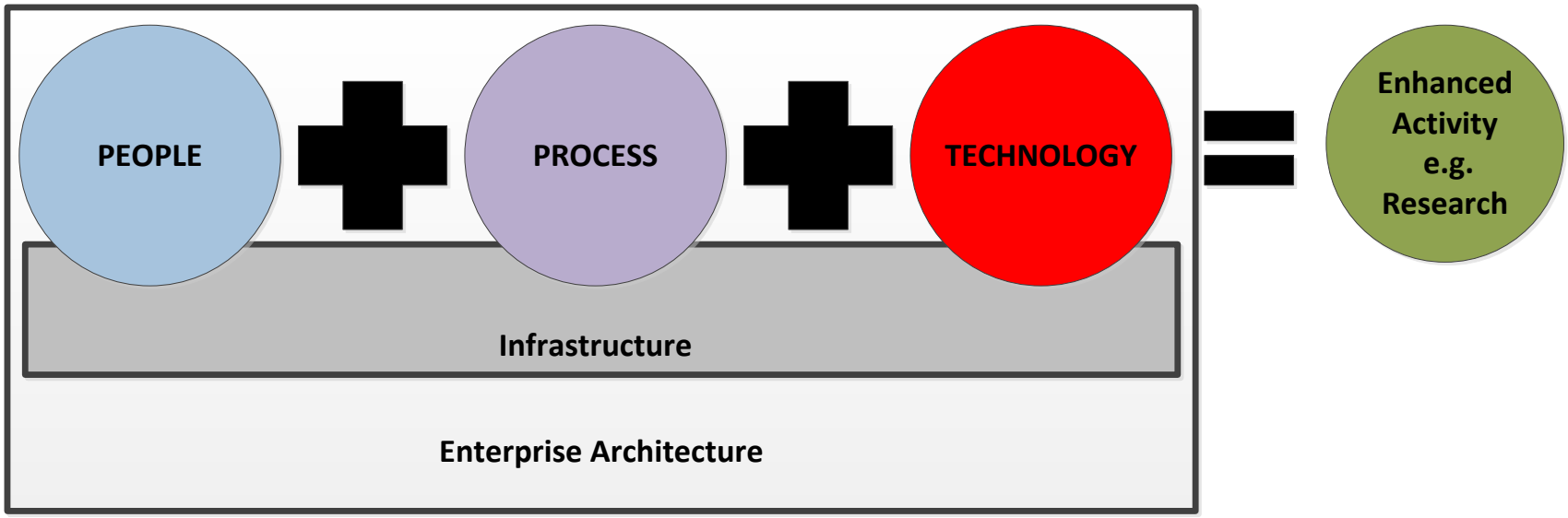
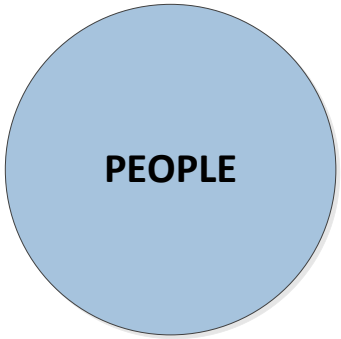
People, Process & Technology cont.



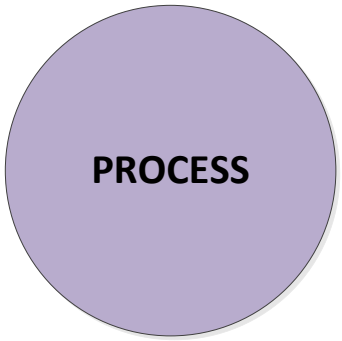
People

- Researchers (Sciences and Humanities)
- Research office (IP, Contracts, etc.)
- Funding agencies (Expectations)
- Librarians (Data management, etc.)
- Teaching and learning (Future Researchers & eResearchers)
- Information technologists (Engage, understand, deliver)



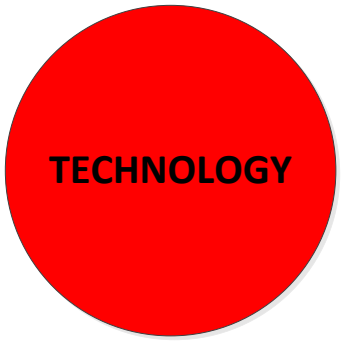
Process cont.

- **Research Process**
  - Grant proposal
    - Data management plan
      - IT requirements
  - Research
    - IT interventions
  - Publication
- **IT Processes**
  - Support
    - Directly accessible
    - Tailored and on-site
  - Provisioning
    - Auto provisioning
    - Self service
    - Bespoke
    - Backup



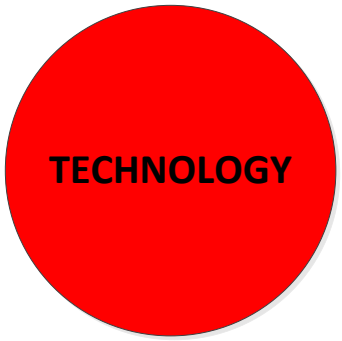
- **Library processes**
  - Data management
    - Curating
    - Metadata
    - Archiving

Technology



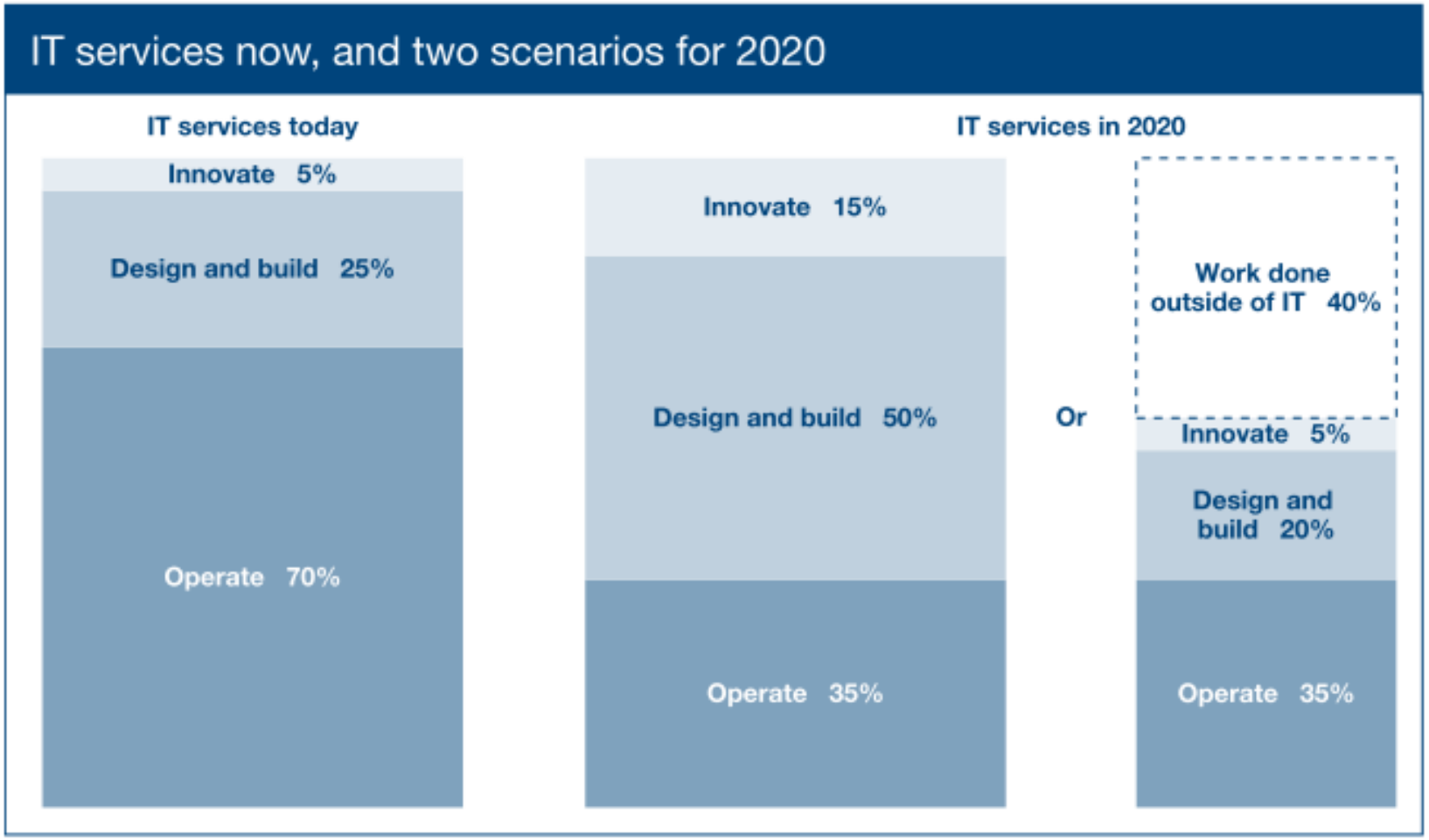
- Computation
- Visualisation
- Collaboration
- Data storage and
- Things we haven't even thought of,
- But it is not about the technology, right?

Some challenges ahead (selective)



- **Resourcing**
  - Funding
    - Staffing
  - Changing and/or new roles
- **Technology (limitations)**
  - Local Area Network
  - Compute (power)
  - Security and Control (rethink needed)

Resourcing: Shift happening



Source : Gartner, 2011

Resourcing: A new role, an example

- *"Building awareness, skills and usage of cyberinfrastructure techniques and tools amongst researchers.*
- *Interface Information Communication Technology Services (ICTS) and external suppliers to provide sophisticated computing technology options and solutions for researchers, eg: HPC, virtual and hosted environments.*
- *Facilitating effective research data management planning, data storage, security and reuse.*
- *Facilitating sharing and collaborative development of research technology tools between institutions.*
- *Helping to integrate technology support for researchers within pre-existing and/or research centric ICTS support models."* UOW (2012)

Resourcing: Options

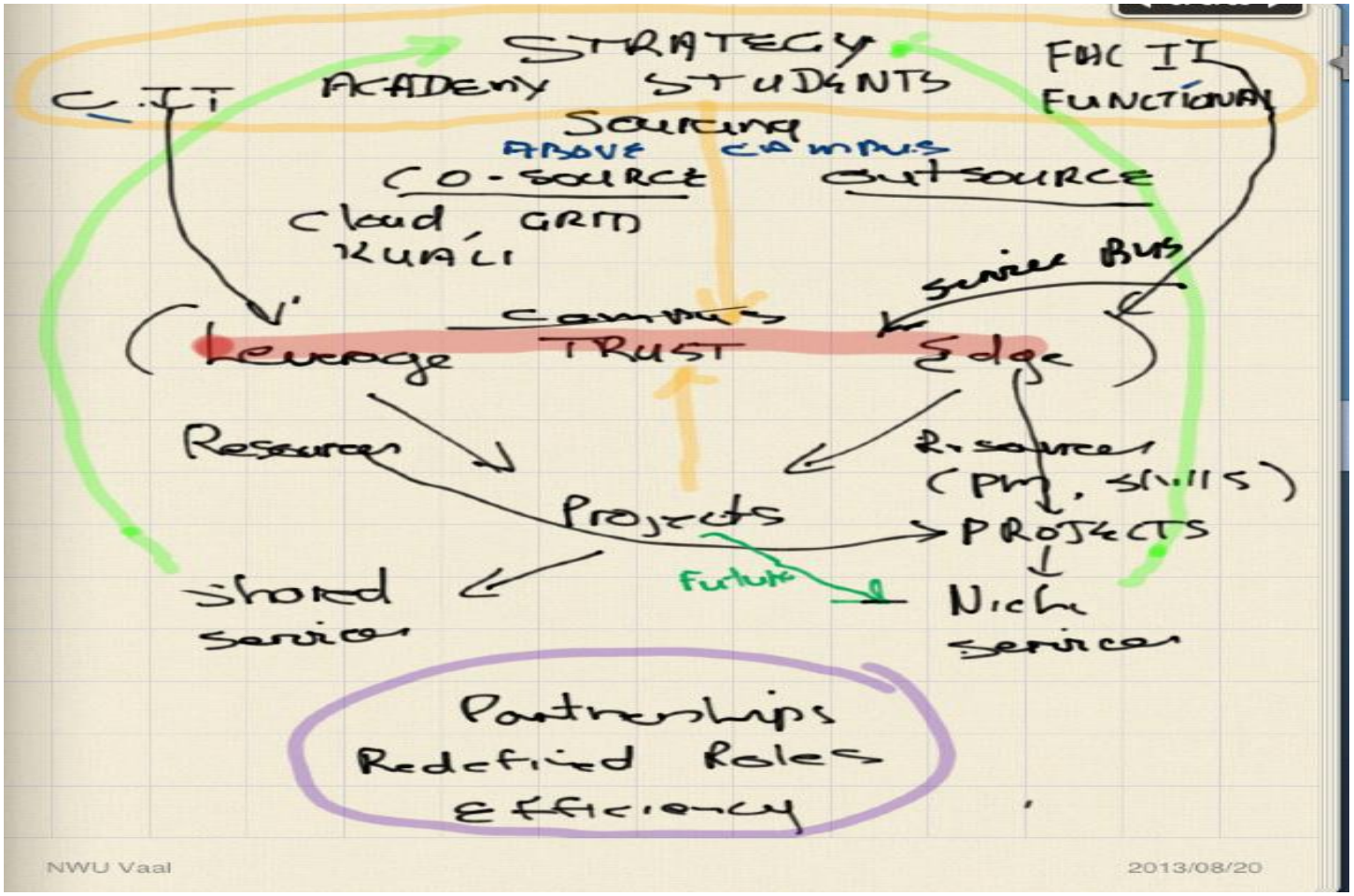
- **Cloud in all its flavours**
  - Not a strategy it is a sourcing model
- **Centre's of excellence**
- **Partnerships with business**
- **Research funding**
- **Re-alignment**
- **Develop capacity (T&L, national)**
- **Edge, Leverage and Trust**

Image by Alexander Oriov taken from 123RF

Resourcing: ELT and snowflakes

Taken from Fanpop, 2013 (Spin Entertainment)

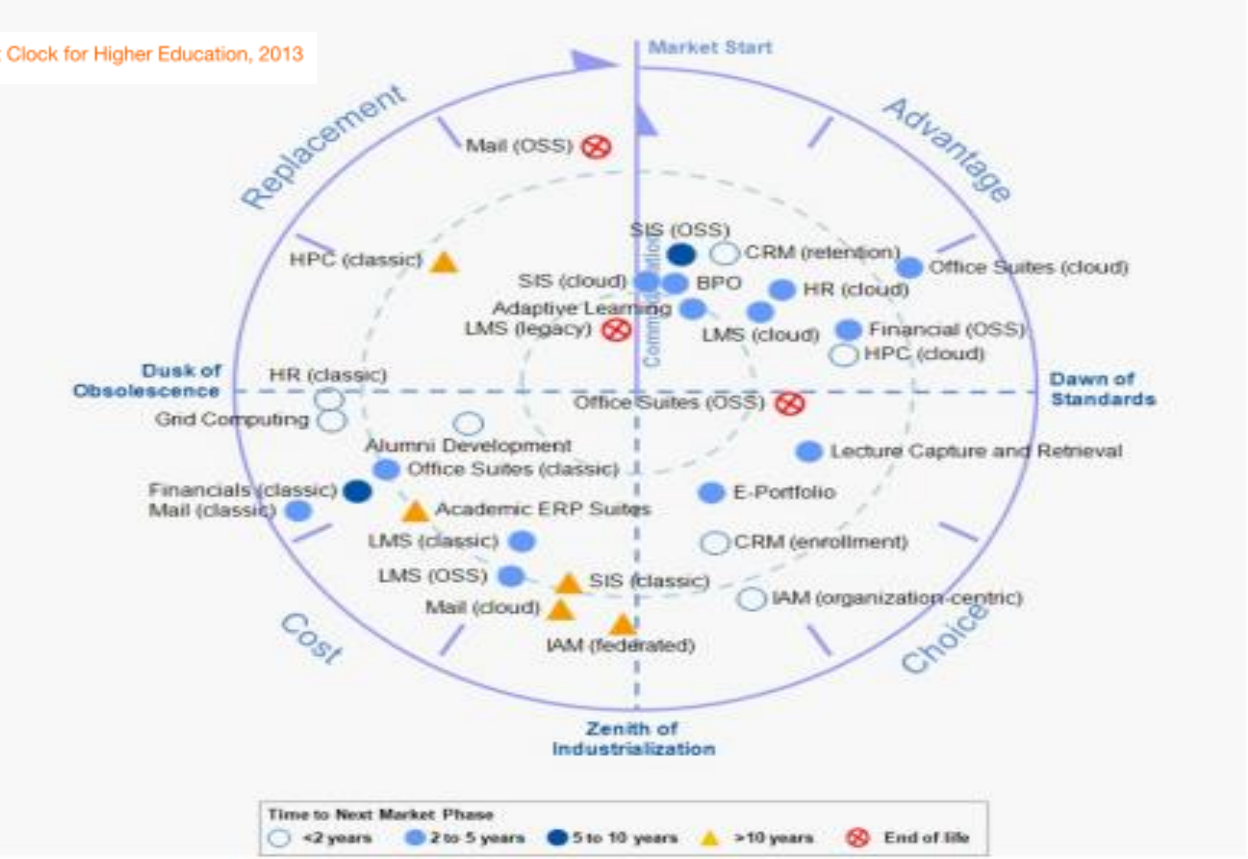
Resourcing: ELT and snowflakes



Adapted from Workman and Holloway (2010) in conversation with Barry Walsh

Gartner market clock 2013

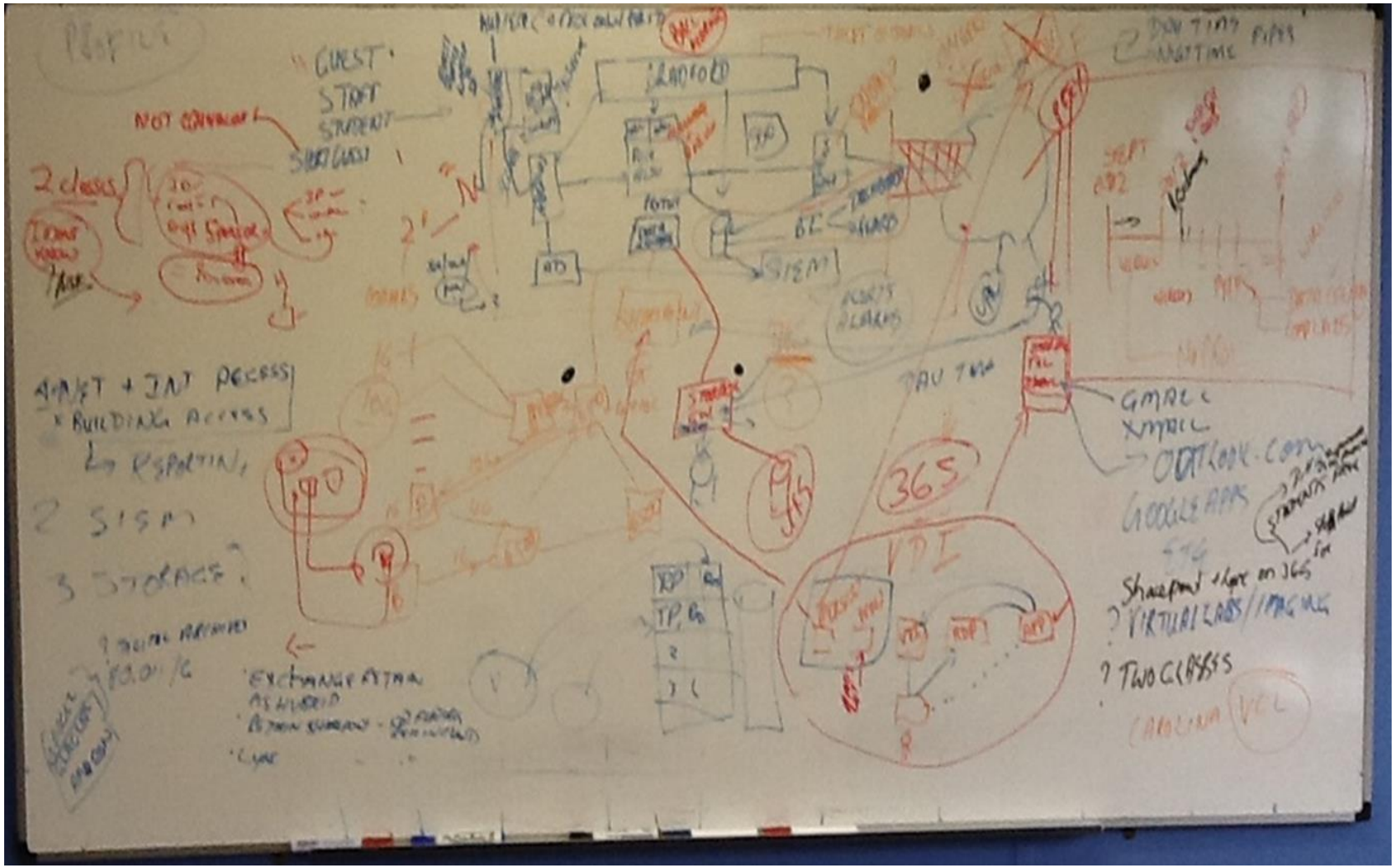
Figure 1. IT Market Clock for Higher Education, 2013



HPC = high-performance computing
IAM = identity and access management
LMS = learning management system
OSS = open-source software
SIS = student information system

Source: Gartner (September 2013)

In the beginning …



An architecture

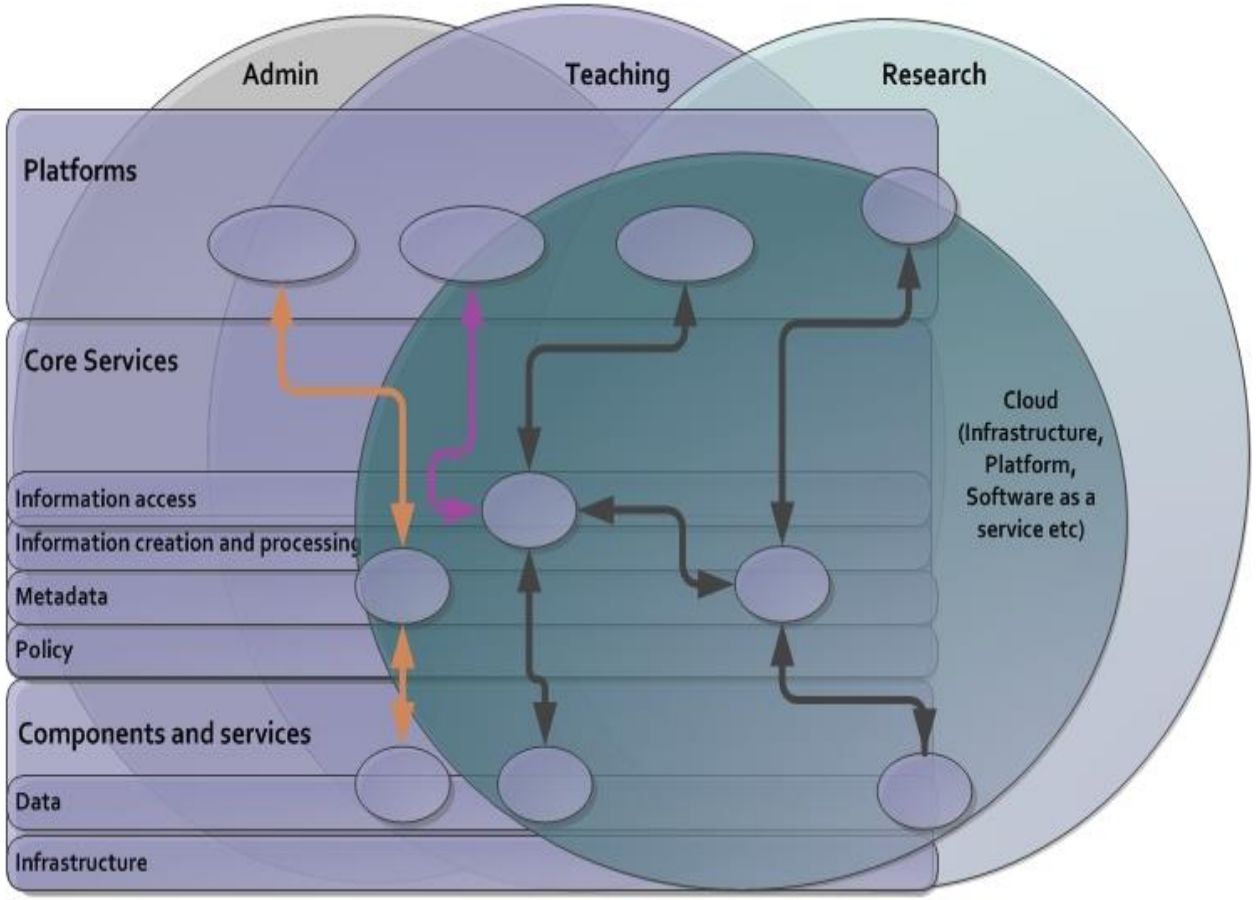
Research platforms align capability with research processes within enterprise architecture

Specialist research applications within platforms enable research processes

Specialist research applications use core services

Core services deliver to research needs

Components and services implement core services

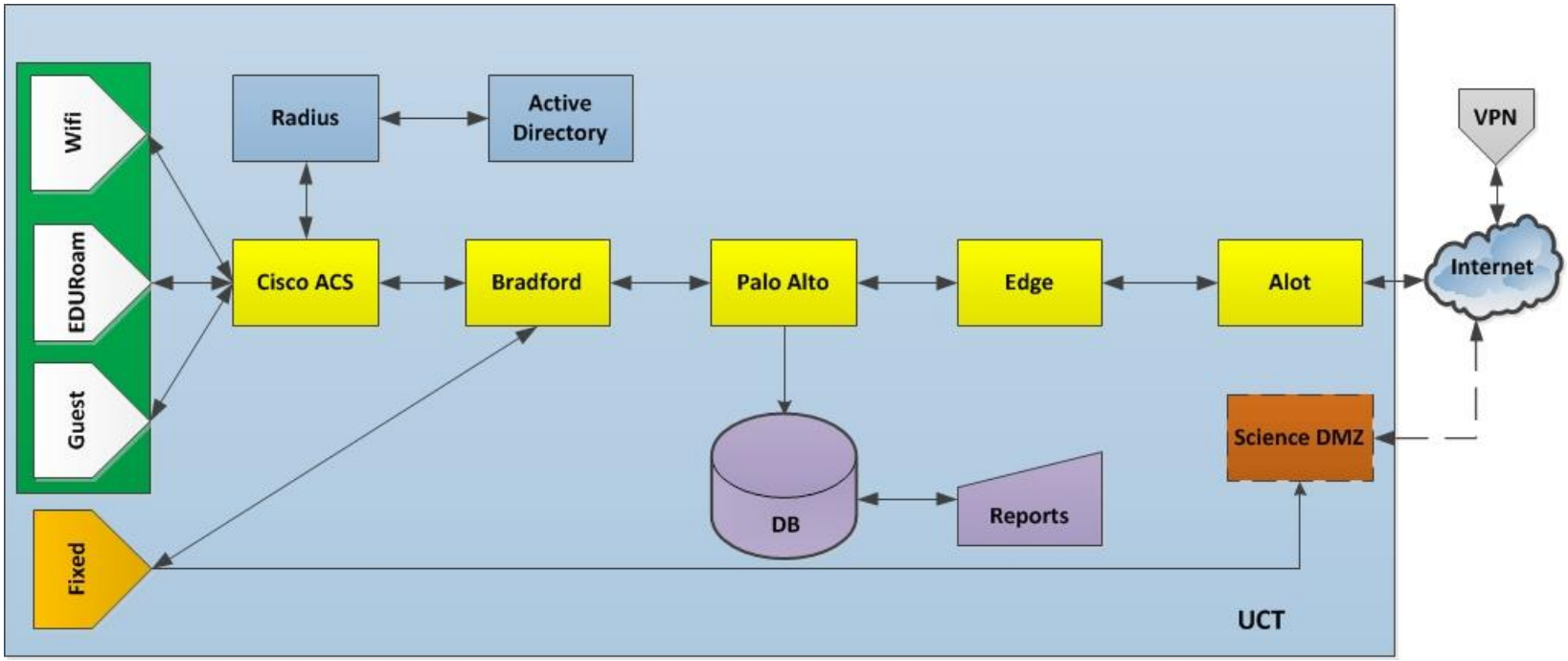


Alignment of proposed cloud services to enterprise and technical architecture
Source: Adapted from OECD (2012)

Infrastructure

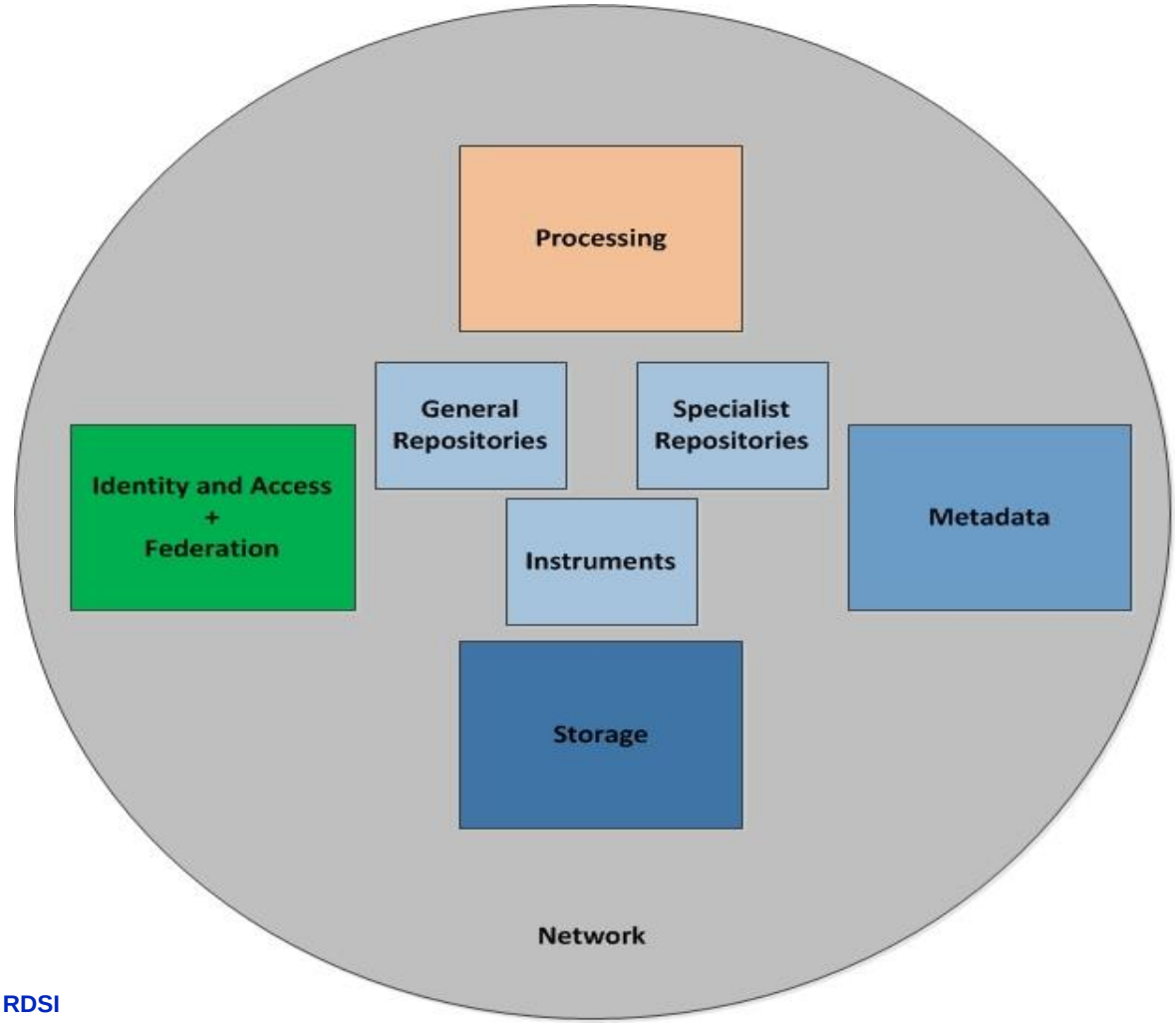
Taken from InsideCloud

Infrastructure cont.



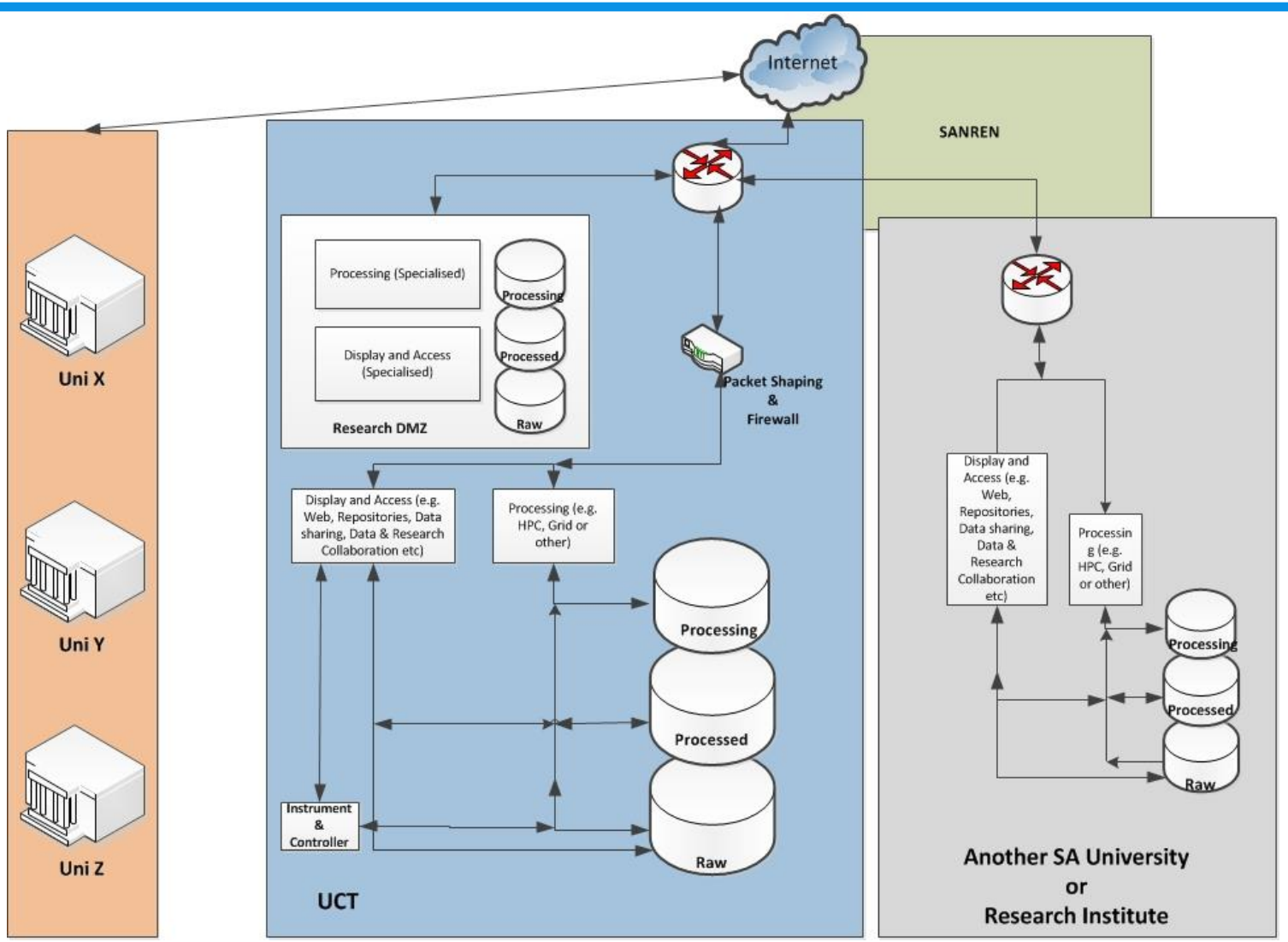
- **Accommodates …**
  - Research
  - Teaching and Learning
  - Administration

Infrastructure cont.

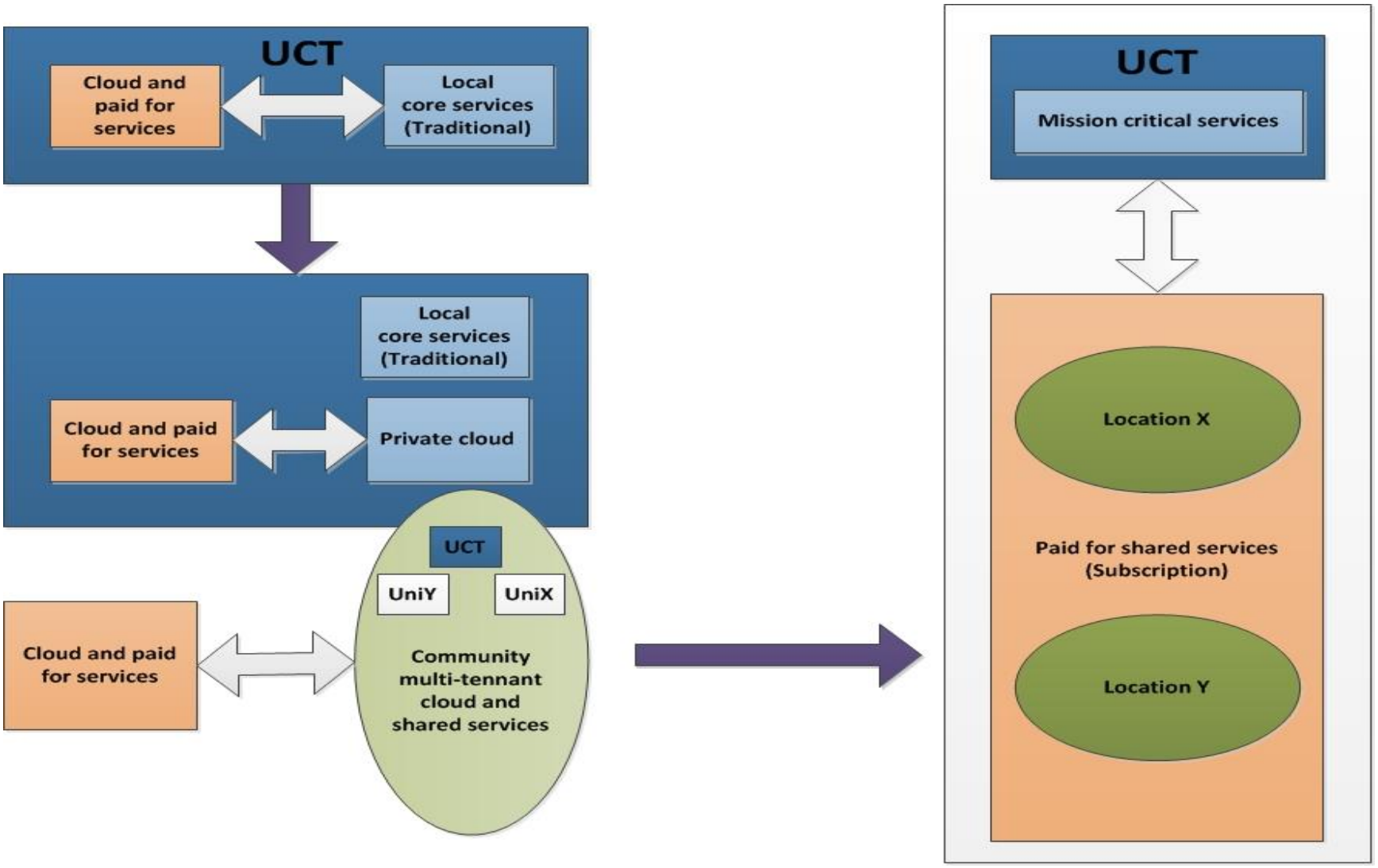


Taken and adapted from RDSI

Infrastructure cont.



Infrastructure cont.



Researchers want and don't want …

- *"Tools and services must be in tune with researchers' workflows, which are often discipline-specific (and sometimes even project-specific)*
- *Researchers resist top-down and/or mandatory schemes.*
- *Researchers favour a "cafeteria" model in which they can pick and choose from a set of services or tools.*
- *Tools and services must be easy to use.*
- *Researchers must be in control of what happens to their data, who has access to it, and under what conditions. Consequently, they want to be sure that whoever is dealing with their data (data centre, library, etc.) will respect their interests.*
- *Researchers expect tools and services to support their day-to-day work within the research project; long-term/public requirements must be subordinate to that interest.*
- *The benefits of the support must be clearly visible – not in three years' time, but now.*
- *Support must be local, hands-on, and available when needed*." **(Feijen, 2010)**

Don't jump to conclusions speak to your researchers and listen, listen, understand… do and do it all over again!

Conclusion

- **It is all about …**
  - Core activities – research
- **Resources (Alternative approaches)**
- **Connectivity, a transparent super highway … flexible and elastic solutions which aggregate, disaggregate, improve and finally deconstruct in support of research (le Roux, 2013)**
- **People (Technologists, et al) with the right mind set - Can do**
- **Collaborative relationships (Internal and External)**

YES! You can herd cats

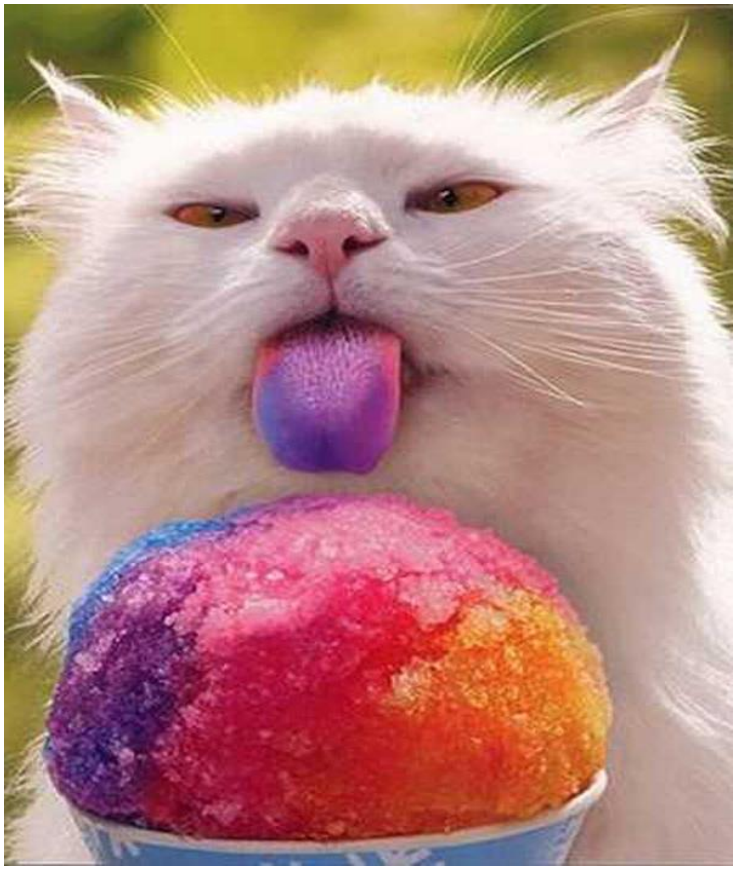


Image taken from The World of Mentalists

Questions

Thank you!

Taken from Furious Diaper (2013)

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