

DECENTRALIZED RESEARCH DEPARTMENT CASE STUDY

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INF2177 Assignment 3: Aligning Business,
Organization, Information, and Systems Architectures

CASE STUDY

DRD is a large department in a public research university:

- \$2 billion in revenue and \$1 billion annually-awarded research funds
 - 80,000 students, 1,900 faculty and 14,000 staff
- [Facts & Figures, 2014]

Essential process areas are teaching and research:

- Supporting ~30 labs performing research across its discipline
- Stewarding large volumes of information
- Using many information systems

BUSINESS CONTEXT

CUSTOMERS

Segment	Customers
Teaching	University, Faculty, Students
Research	Researchers, Other Departments & Partners, Granting Bodies

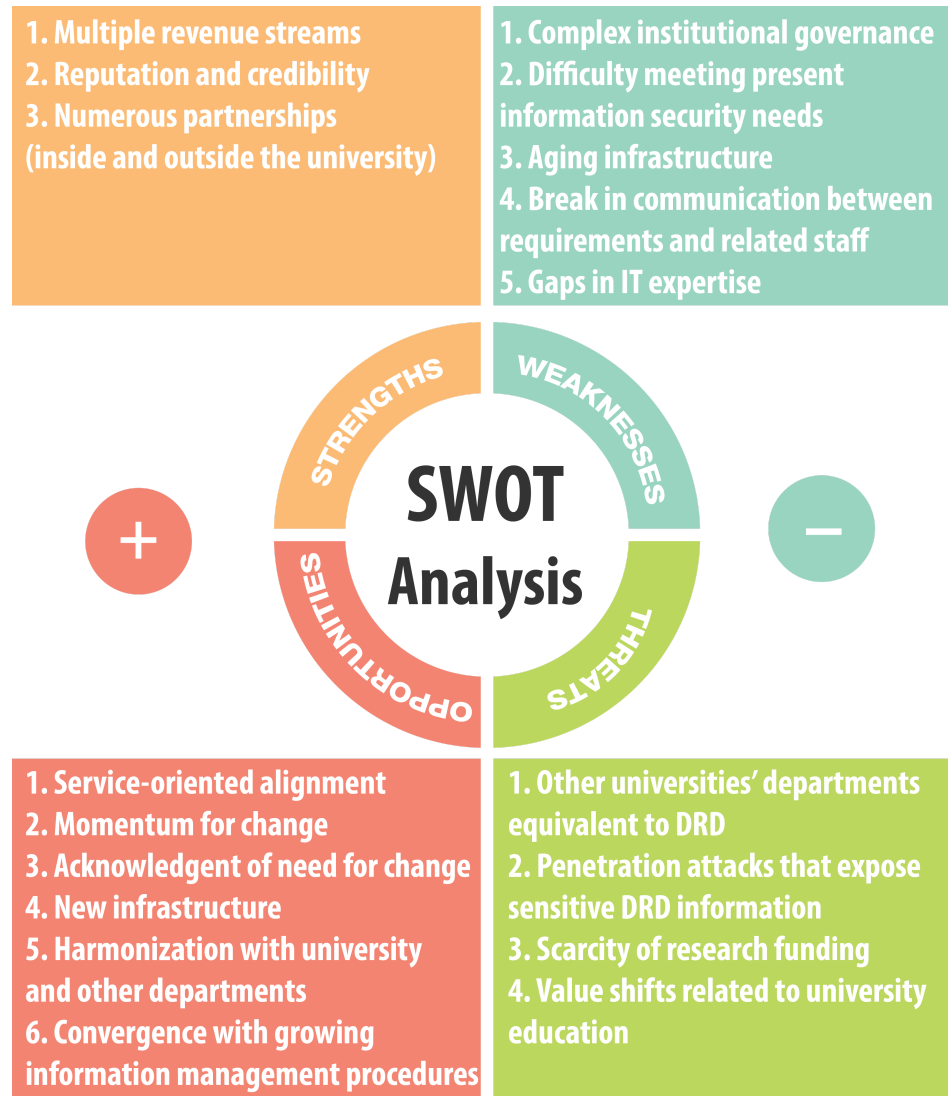
COMPETITION

- Competition between institutions against the backdrop of informal and formal collaborations
- For funding is perhaps the strongest, limited and rivalrous nature of grants

BUSINESS CONTEXT

INFORMATION MANAGEMENT

- Dense matrix of university-wide policies from many governing bodies, emphasis on research ethics
- Provincial and Federal Regulations (PIPEDA, Digital Privacy Act [S-4], PHIPA)



ORGANIZATIONAL CONTEXT

OBJECTIVES & STRATEGIES

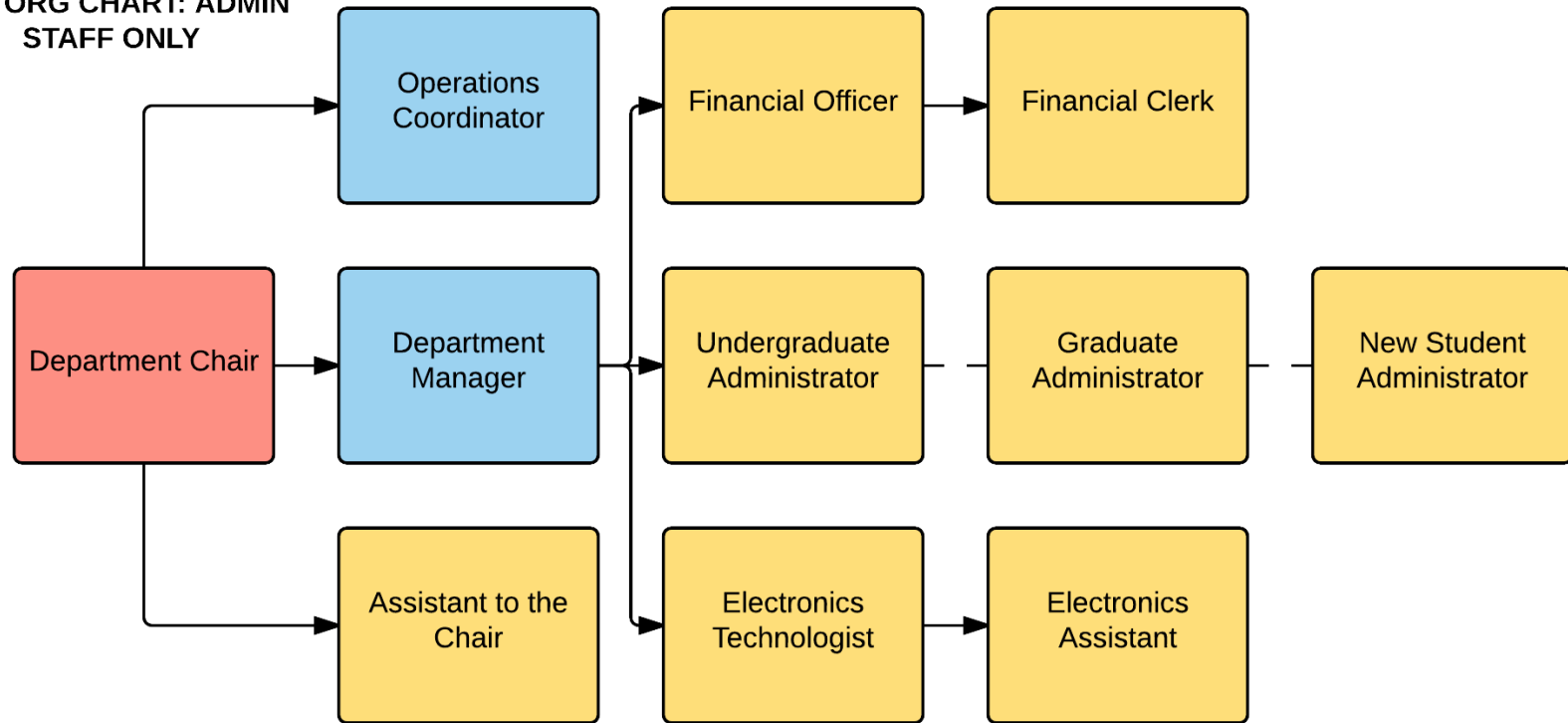
- Support the labs that compose DRD, facilitating research publications and meaningful results
- Support faculty members meet Research Ethics requirements for their work
- Strategize to make IT resources more scalable and reliable
- Faculty key stakeholders to get on board for any organizational change

ORGANIZATIONAL CONTEXT

STRUCTURE

- Administrative staff hierarchical with clear divisions (Finance, Admin, Tech)
- Faculty managed separately and power is highly decentralized
- Research labs totally controlled by the faculty member in charge: organizational structure, practises and policies, information systems, information management and security

DRD ORG CHART: ADMIN
STAFF ONLY



Executives

Managers

Staff

A is superior to B
→

— — — — —
is equal to

INFORMATION MANAGEMENT LANDSCAPE

Information processes centered around research data are focused on:

- information transfer
- post-collection processing
- storage and backup
- monitoring and logging network and equipment behaviour

Currently these processes are decided by individual research units, and no unifying architecture, toolkit or application portfolio exists beyond a single Wi-Fi Network.

KEY CHALLENGES

1. **Business (Teaching):** Balancing the need for revenue with the ability to deliver high value to its students
2. **Business (Research):** Remaining responsive to the research needs of external agencies and funders
3. **Organizational:** Transforming a decentralized power structure making organization-wide change difficult, especially given the scarcity of information and IT expertise
4. **Information:** Keeping an aging IT infrastructure up to date with key requirements in security, storage and access subject to many stringent regulations

KEY OPPORTUNITIES

1. **Service-Oriented Alignment:** DRD can reposition to offer service and support for other departments, provisioning physical assets as services [Chui et al. 2013]
2. **Acknowledgement of Need for Change** Newly created Operations Coordinator position has mandate to make improvements to existing processes, create new processes focussed on meeting DRD's technology needs
3. **Information:** Modernizing IT infrastructure leads to convergence with, and sets the tone for industry wide best practises
4. **Momentum for Change:** institution- and organization-wide push toward improved information management

SCENARIOS

- Documentation and Knowledge Management
- Full Neoliberalism and Service Delivery
- University 2.0

DOCUMENTATION AND KNOWLEDGE MANAGEMENT

< 5 YEARS

- Knowledge management practises may help to codify and standardize procedures for infrastructure deployment and procedure
- Collaborative information systems can assist document storage and increase research efficiency
- Information systems documenting equipment and task management can address critical needs within the DRD's IT department

FULL-NEOLIBERALISM AND SERVICE DELIVERY

5-10 YEARS

- Service agreements around website, storage, exchange servers, etc. from centralized IT
- Total information and systems architecture alignment with centralized IT
- New requirements and roles within DRD driven by synergy with other business units

UNIVERSITY 2.0

10-15 YEARS

- Sea change within the university: bringing the Academy to the Net Generation
- Organizational strategic shift toward 'real business': informationalized and transformationalized research product services and data stewardship [Tapscott, 2006]
- Research relationships and partnerships opened and networked [Kotter, 2012]

PROPOSED IMPROVEMENTS

Proposed improvements iterable, to be implemented over several years and channel momentum to:

- Rearticulate the value-proposition of research activities
- Create a multi-year strategy for organizational change
- Understand performance for data-driven decisions
- Collaborate internally and externally to develop standards that can model best practises
- Modernize IT infrastructure, setting the stage for sustainable and conservative growth

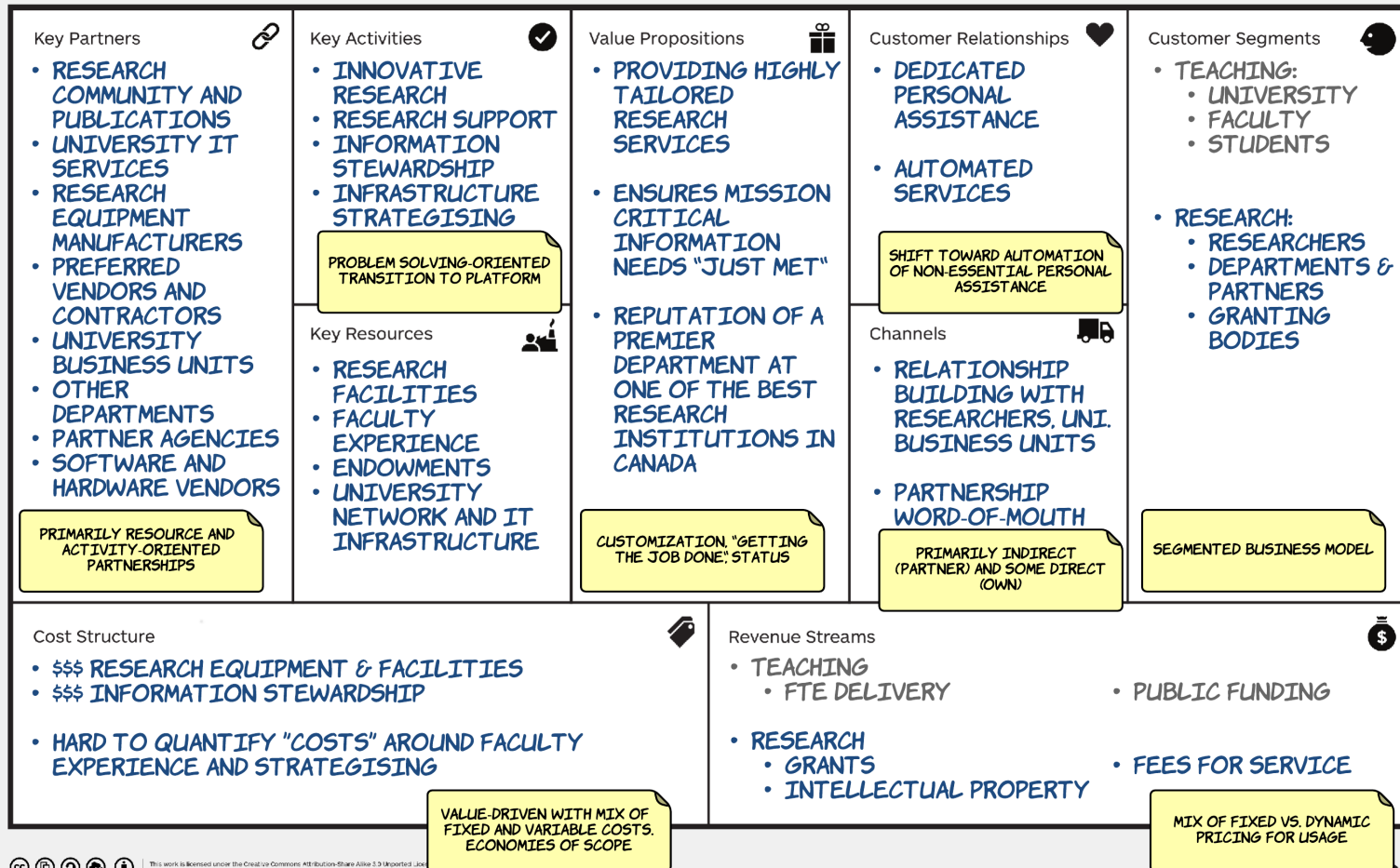
The Business Model Canvas

Designed for:
DISTRIBUTED RESEARCH
DEPARTMENT (DRD)

Designed by:
DLCD CONSULTANTS

Date:
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10



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DESIGNED BY: Strategyzer AG
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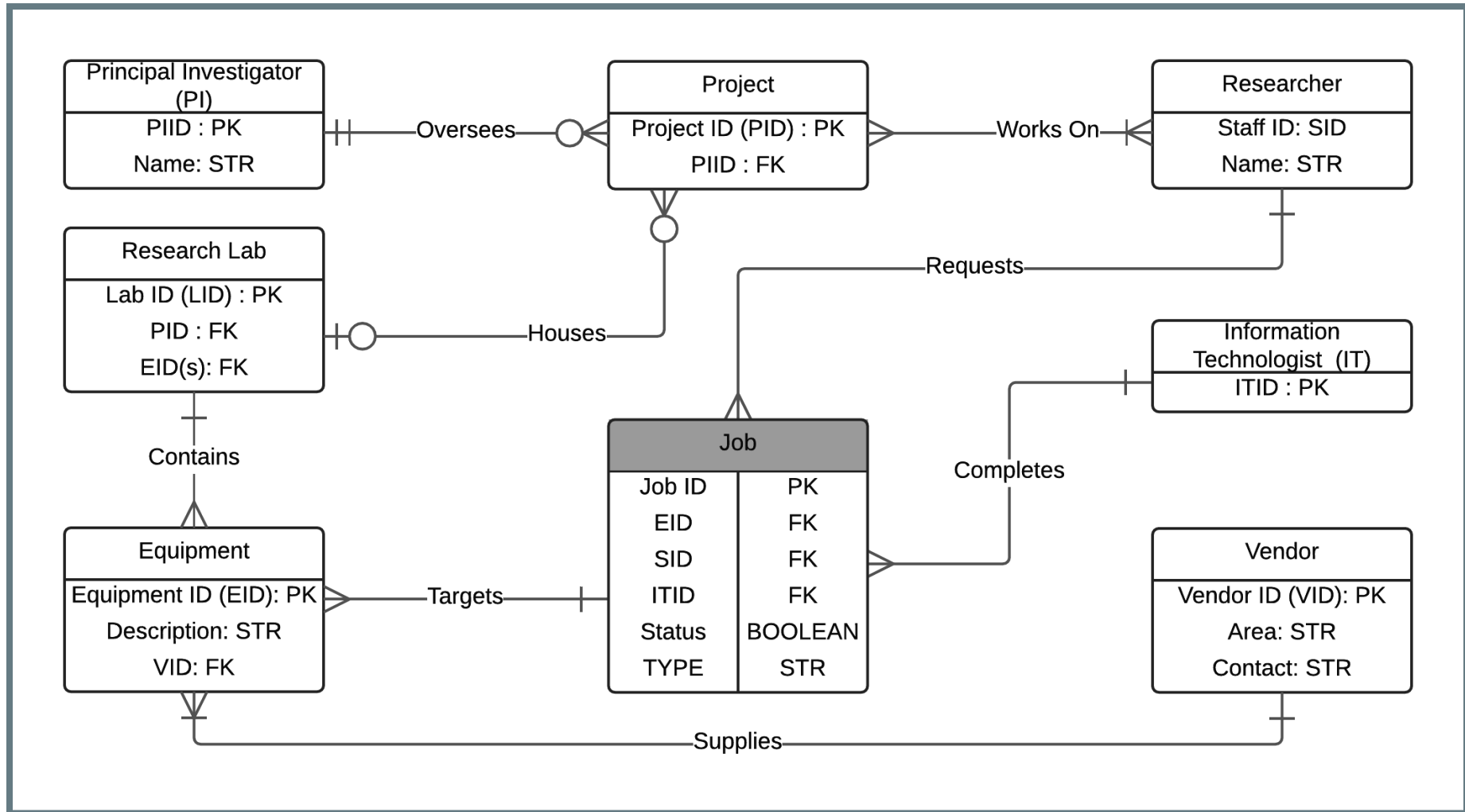

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INFORMATION ARCHITECTURE

- Partner with other departments around managing network security
- Establish an open and collaborative set of best practises for information management
- Create a set of measurable performance indicators (maintenance, problematics, etc)
- Develop a comprehensive inventory information model for tracking tasks

INFORMATION MODELS



Suggested ERD for Task Management

INFORMATION ENTITIES, PROCESSES AND RELATIONSHIPS

Information Architecture is designed to facilitate **OC** and **IT** support of **researchers** in the business crucial *processes* of research and publication, through the standardization of information subprocesses:

- Maintaining Equipment
- Deploying Infrastructure
- Adhering to Information Security Best Practises
- Managing everyday Information Flows

EXPANDED ROLES AND PROCESSES

New Process	Role Impacted
IT Management	OC and Electronics
Network and Asset Mapping	OC
Support Ticketing	Faculty/Researchers, OC and Electronics
Automated Task Flow	OC and Electronics
Inventory Managements	OC and Electronics
Backups and Recovery	OC and Faculty/Researchers

NEEDS MET

NEAR-TERM

- Increased organization and cohesion
- Improved security of research data
- Build internal capacity to identify recurring problems
- Lay groundwork for greater understanding of information and system needs

MEDIUM-TERM

- Align infrastructure with business needs and regulations
- Create a more collaborative model

SYSTEMS ARCHITECTURE

APPLICATION PORTFOLIO

Application Type	Service	Examples
Collaborative Software	Email, Calendaring	Horde, OpenX
Document Management System	Research Collaborating	ShareLaTeX, TSpace, Owncloud, Google Docs
Network Monitoring System	Security Management	LogicMonitor
Log Management Tool	Logging	Logstash
Task Management System	Job/Issue Tracking	JIRA
Data Visualization Platform	Performance Analytics	Kibana + Elasticsearch
Management Information Systems (Dashboard)	Performance Monitoring	OPNsense

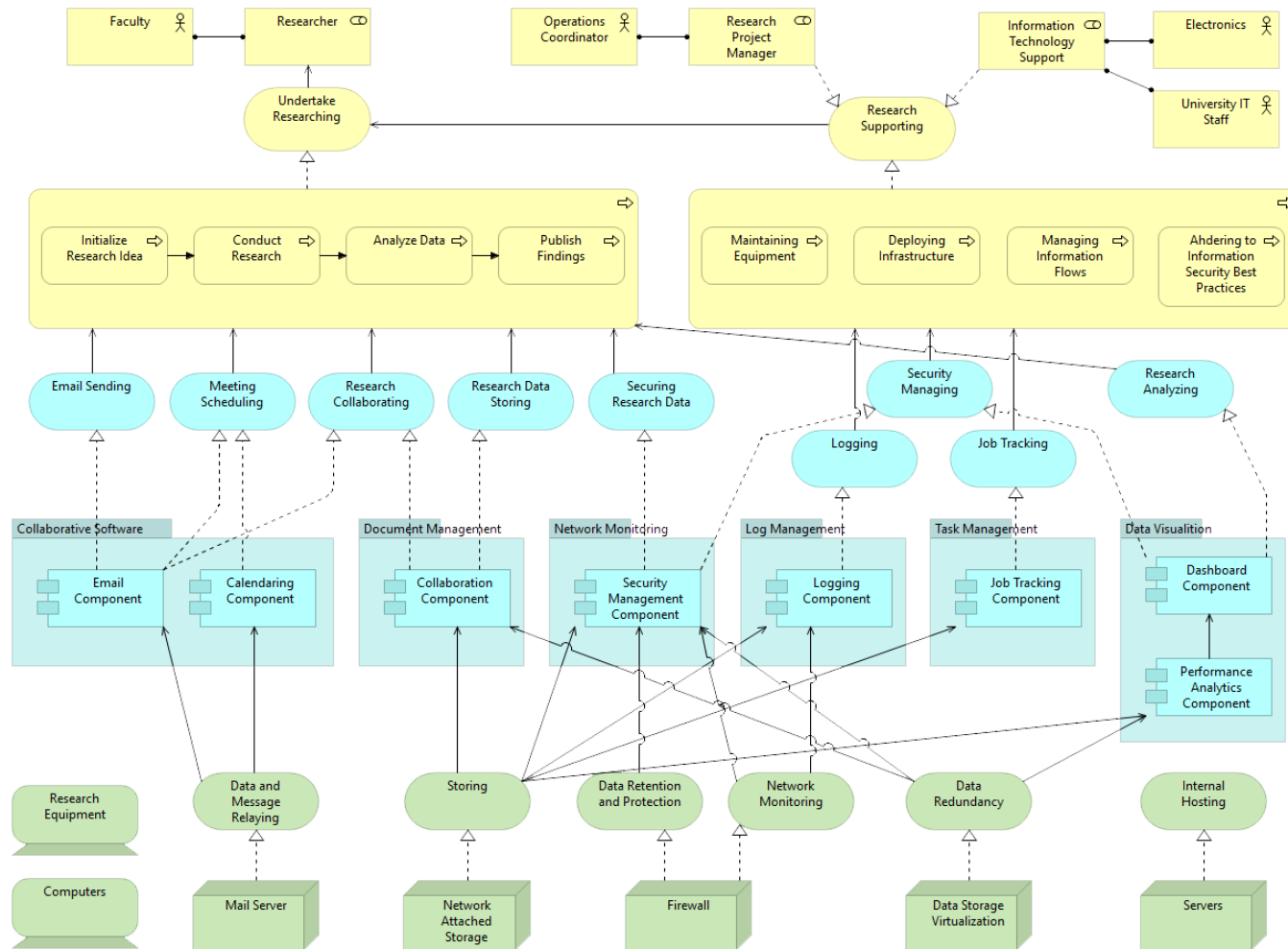
SYSTEMS ARCHITECTURE

INFRASTRUCTURE PORTFOLIO

Infrastructure Type	Service	Examples
Mail Server	File and Message Relay	Exchange Server
Firewall	Data Retention and Protection	CSbox, Cisco PIX
Network Attached Storage	File-level computer data storage	NetGear
Data Storage Virtualization	Data Redundancy	RAID
Servers	Internal Hosting	Computers

INTEROPERABILITY

- Modular application and infrastructure components
- Focused on systems-level openness (FOSS)
- Use of standards (Protocols, semantics models, formats)



ALIGNMENT

- Shifting focus to bring IT closer to business activities
- Creation of common, organization-wide infrastructure
- Accurate mapping of logical models to physical holdings

GROWTH AND EVOLUTION

- Initial implementation small and focused on critical IT needs, but provides tools for further growth
- Systems and applications can be readily expanded beyond initial scope
- Data-driven decisions lead to better data-driven decision-making
- New ambitions for practice contribute to improved workplace culture and DRD achievement

THANK YOU!

QUESTIONS?

REFERENCES

- [Chui et al., 2013] Chui, M., Manyika, J., Bughin, J., Brown, B., Roberts, R., Danielson, J., and Gupta, S. (2013). Ten it-enabled business trends for the decade ahead. Technical report.
- [Facts & Figures, 2014] Facts & Figures (2014). <http://www.utoronto.ca/about-uoft/measuring-our-performance/facts-figures-2014>
- [Kotter, 2012] Kotter, J. (2012) Accelerate! How the most innovative companies capitalize on today's rapid-fire strategic challenges-and still make their numbers. Harvard Business Review 90(11), 43-58.
- [Strategyzer AG, 2015] Strategyzer AG. (2015) Business Model Canvas. <http://www.businessmodelgeneration.com/canvas/bmc>
- [Tapscott, 2006] Tapscott, D. (2006) Winning with the Enterprise 2.0. IT&CA Big Idea Series. 62pp. <http://dontapscott.com/2011/04/setting-the-record-straight-the-enterprise-2-0/>