Consensus in the Chaos The Role of IT Architecture

Terry Bunio // David Wesst

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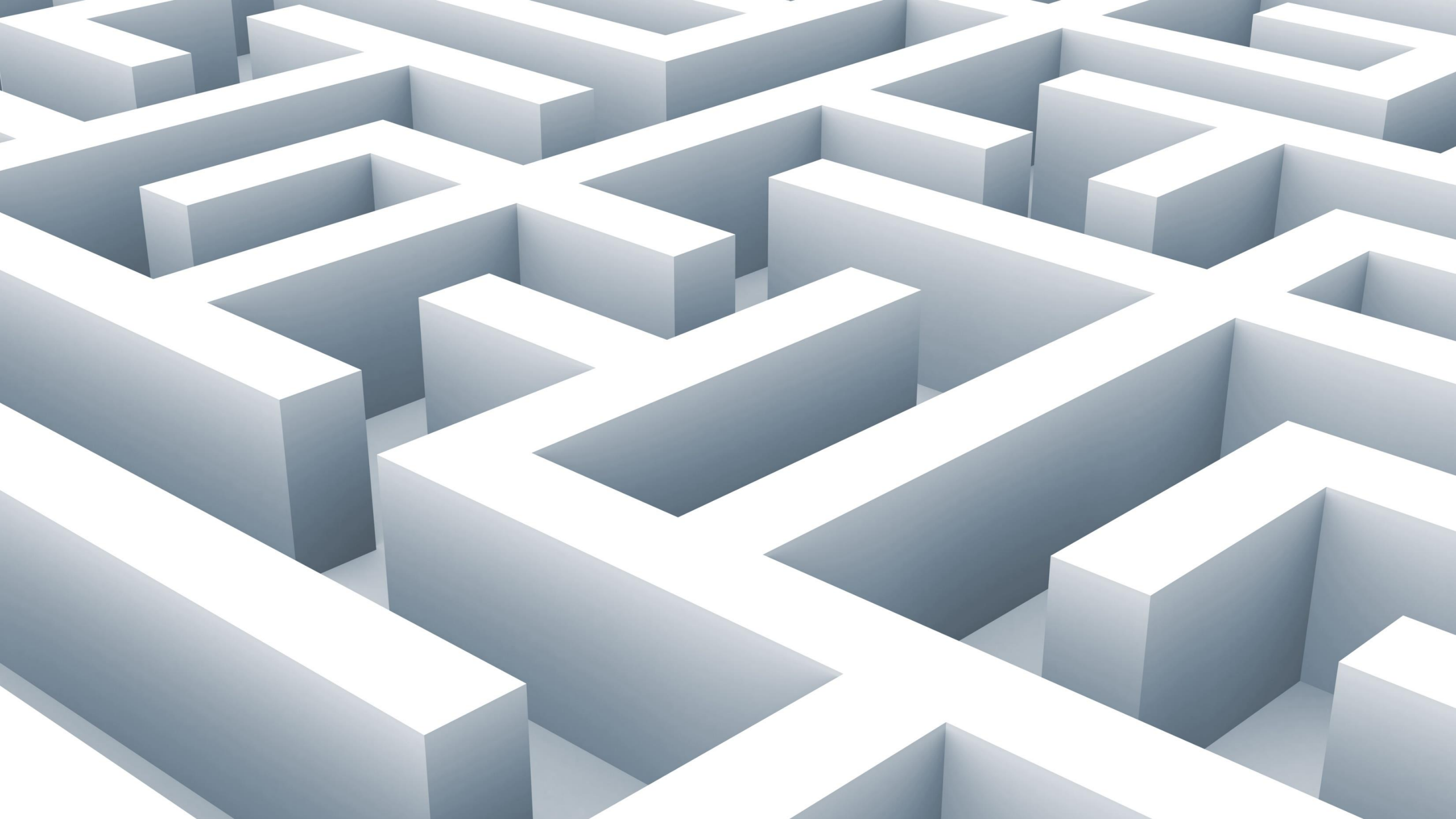
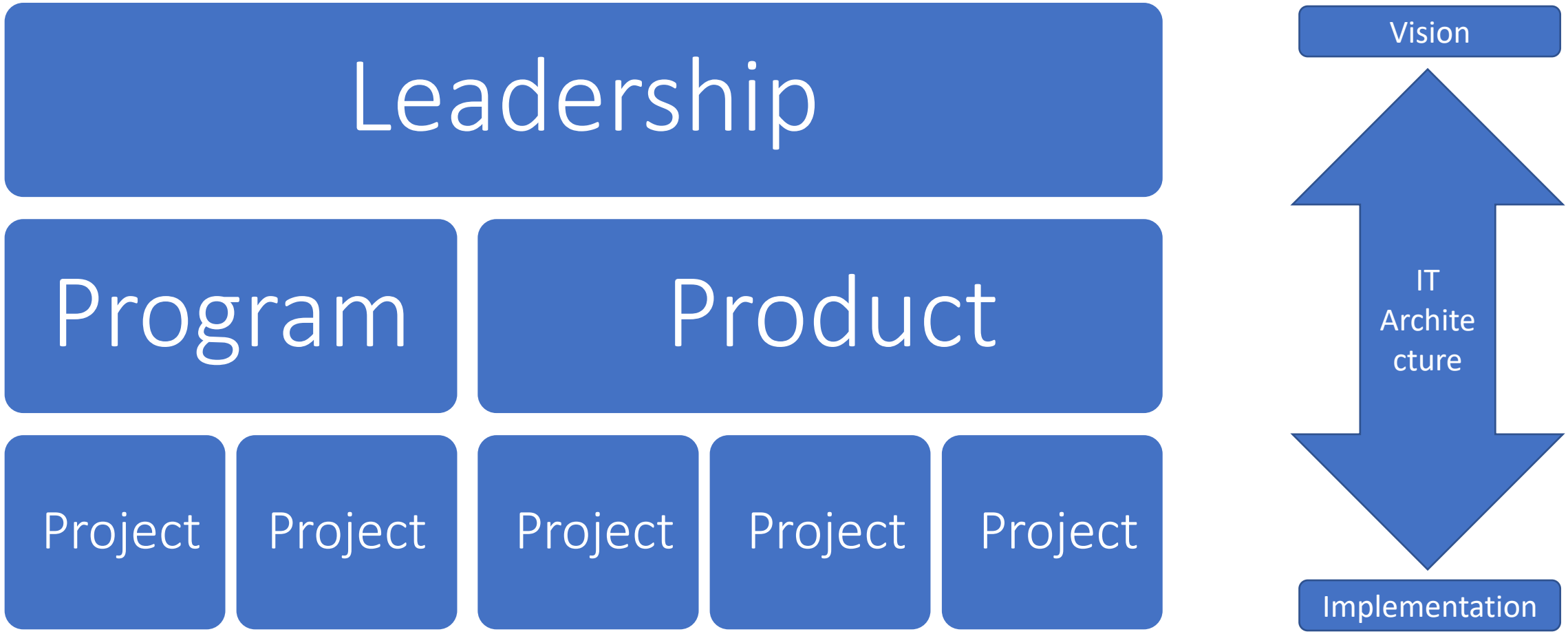


The Solution: IT/Enterprise Architecture

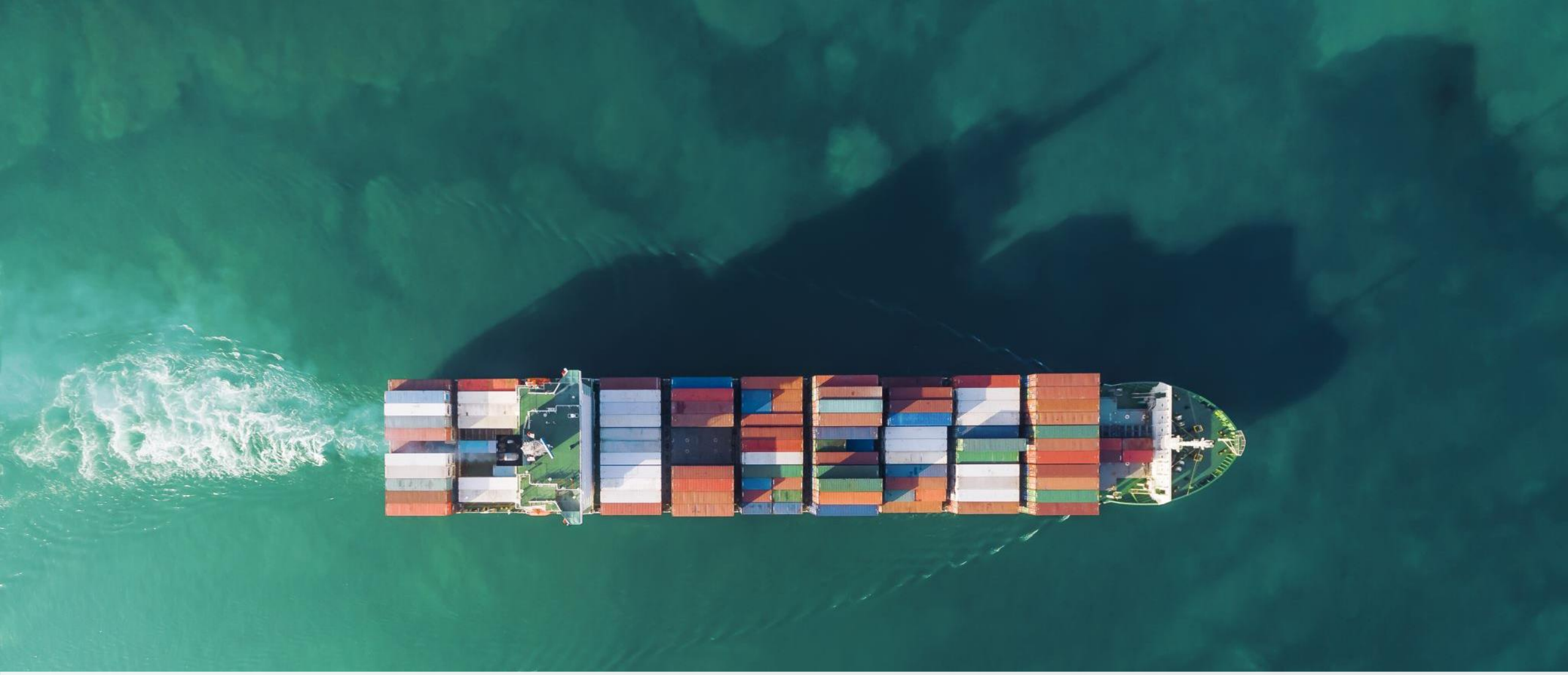


The Solution: IT/Enterprise Architecture

"Enterprise architecture (EA) is a discipline for proactively and holistically leading enterprise responses to disruptive forces by identifying and analyzing the execution of change toward desired business vision and outcomes"

--> Gartner Definition (September 8, 2022)

Fancy way of saying, we help navigate and change course



We help steer the ship

Why are we all here?

Us

To explain what IT Architecture is, using a real-life example: Us (University of Manitoba).

You

To learn why IT architecture is a thing and how it can be applied on a micro, day-to-day level

How will we do this?

- By showing you how we practice Enterprise Architecture at UManitoba today, and how we intend to continue to evolve that practice
- We will walk you through our current framework for EA from the top down (leadership), and from the bottom up (solution architect)

What is IT Architecture?

Terry

National Centre for Truth and Reconciliation
UNIVERSITY OF MANITOBA

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota and Dene peoples, and on the homeland of the Métis Nation. We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.

What is IT Architecture?

Pieces don't put themselves together in the right way all the time.

We do IT Architecture because certain qualities do not just arise when you put one functional component next to the other. Architecture tries to achieve sustainability, dependability, scalability, performance, which are many of the things you do not get right the first time you design a system.

http://www.opensecurityarchitecture.org/cms/definitions/it-architecture

Design the Kitchen

Ever worked in a wonderfully laid out kitchen? That layout is not an accident.

A kitchen is comprised of many functional components: a sink; stove; fridge; workspace; storage; etc.

When put together one way the efficiency of work done in the kitchen is much higher (and more enjoyable) than if the components were arranged another way.

So it is with systems.

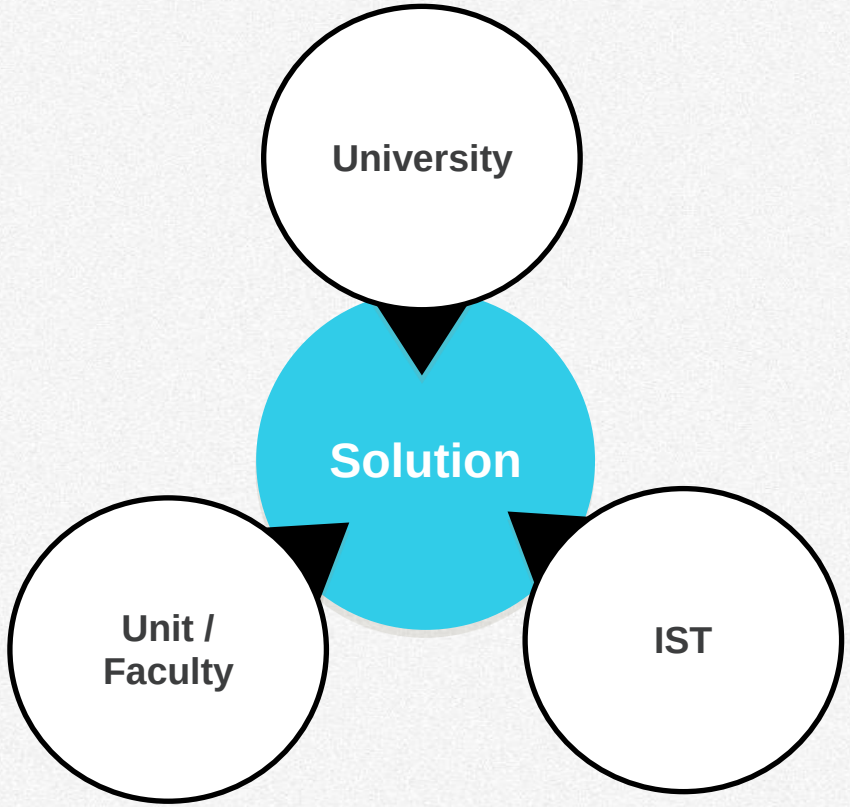
Three Part Conversation

Architects add the Institutional perspective to conversations.

Traditionally, conversations about solution are often focused on the right solution right now: how IT can meet the particular need of the department, unit or faculty.

IT Architecture ensures a place at the table for the wider need and value to the University.

In many conversations this perspective can be missing. This third perspective ensures that the overarching success of the institution and the wider value and benefit of any given solution is considered and given weight.



The IT Architect
a profile

Architects are T-Shaped people: they have breadth and depth.

These technical leaders have a breadth of understanding of the organization coupled with deep technical expertise.

They are integrative thinkers that pull together technical and business domains.

They think with the big picture in mind, so that solutions will not only be the right solution, right now, but also the right solution long term and in the context of the whole technical ecosystem.

The Architect…
Sets technical direction.
Establishes standards.
Plans with a view to the strategic context.

They…
Provides technical leadership on projects.
Own the technical solution
Put the solution into context
Frame decision options and recommend approaches
Plan for long term fit, operation and evolution of systems and environments

They think in term of roadmaps, models, frameworks, patterns, capabilities, trade-offs

They are planners, designers, integrative thinkers, pragmatic purists

Their focus is standardization and Integration

With a view to balancing competing interests and highlighting risk and costs.

Expert Guidance

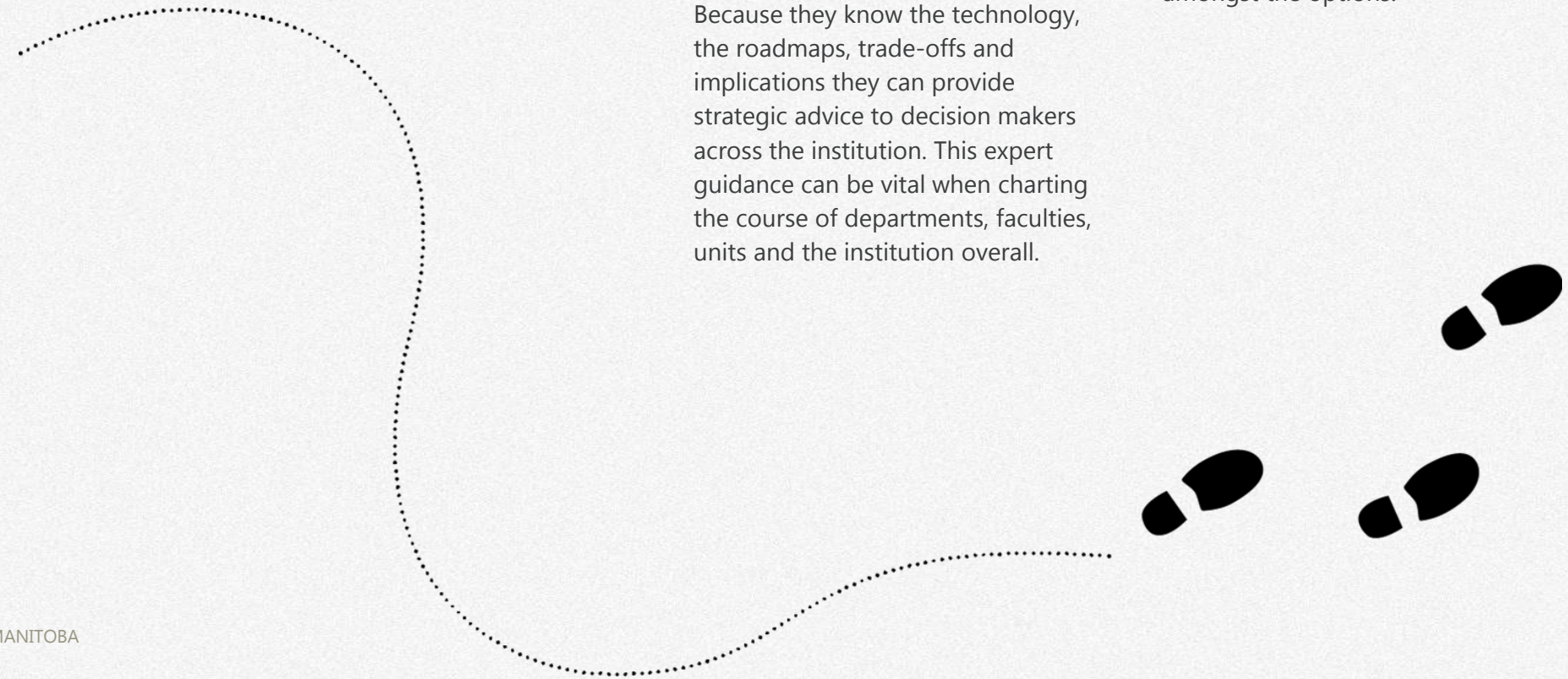
Architects help decision makers make decisions.

Architects are the big-picture thinkers who are looking at all the pieces to see how they fit together. They observe the state of change to see how the pieces will need to fit together in the future.

Because they know the technology, the roadmaps, trade-offs and implications they can provide strategic advice to decision makers across the institution. This expert guidance can be vital when charting the course of departments, faculties, units and the institution overall.

Recommend

Architects don't just present options, they recommend direction. Architects know the business context and understand the trade-offs enough to present a preferred solution from amongst the options.



Technical Direction

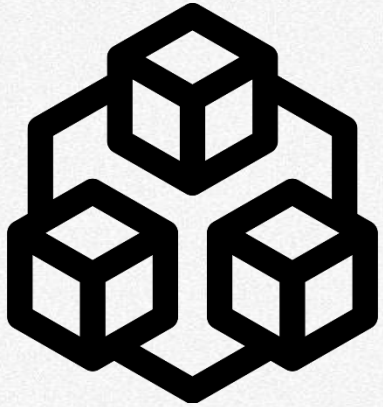
Up and out. Figure out where we are going and plant the flag so we can all get there.

Architects set technical direction. These are the big picture thinkers that get up and out in front to say “here is where we are going”. They look at the technology and the business needs and create a roadmap that gets us to where we need to be. They position the institution well for the future through applied innovation.

Sometimes projects or initiatives may veer off in a different direction (for lots of reasons), and there is lots of in-place systems and technology that make the path more challenging. But the architects take the long view to look at where we ultimately need to end up.

Core Competencies

Skillsets and expertise that we will focus on within our practice



The University has identified 9 architecture competencies that we focus on developing and improving over the next three years. These are areas that we believe will be critical to run our environment and support the mandate of the institution. While architects are generalists that need to know a lot about a lot, no one knows everything. These are areas that architects may go deep on.

Network

The infrastructure that connects us and enables communication.

Data/BI

Understanding, managing and using our information.

Integration

Connecting the pieces together to create a seamless experience across systems and business units.

Application

The software tools that we use to do the work we do.

Cloud

Taking advantage of cloud technology for our environment.

Security

Control and protect our environment.

Mobile

Solutions and infrastructure to support mobile devices.

AV

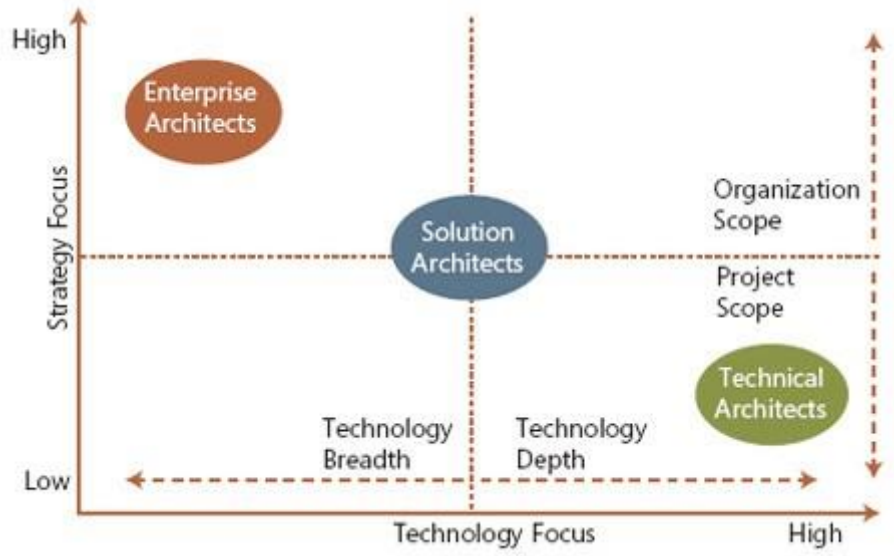
Audio visual solutions for teaching, learning and business.

Server/Storage

The compute and storage to run our systems including research and high performance computing.

IT Architecture
The Roles

There are three key roles that architects play, that speak to strategic focus vs technological depth.



Enterprise Architect

The Enterprise Architect (EA) is a planning and leadership role that is responsible for identifying the future state of the organization's IT environment -- in the context of the business strategy -- and engage wherever and whomever necessary to help guide the organization to deliver toward it. This is a transformation role that looks at future-state. Where are we going and why.

Solution Architect

The Solution Architect (SA) or Systems Architect is the technical lead on projects. They are responsible for designing a high level solution to a specific set of business requirements, within the organizations architecture framework. This solution may span multiple applications or technologies.

Technical Architect

The Technical Architect is a technology specialist in a particular technology or group of inter-related technologies. They are responsible for implementation of, and processes within, a specific technology, application or suite of applications. They have deep knowledge in a particular competency (or set of competencies) and will often be consulted by other architects as part of a larger solution.

IT Architecture Practice
the journey

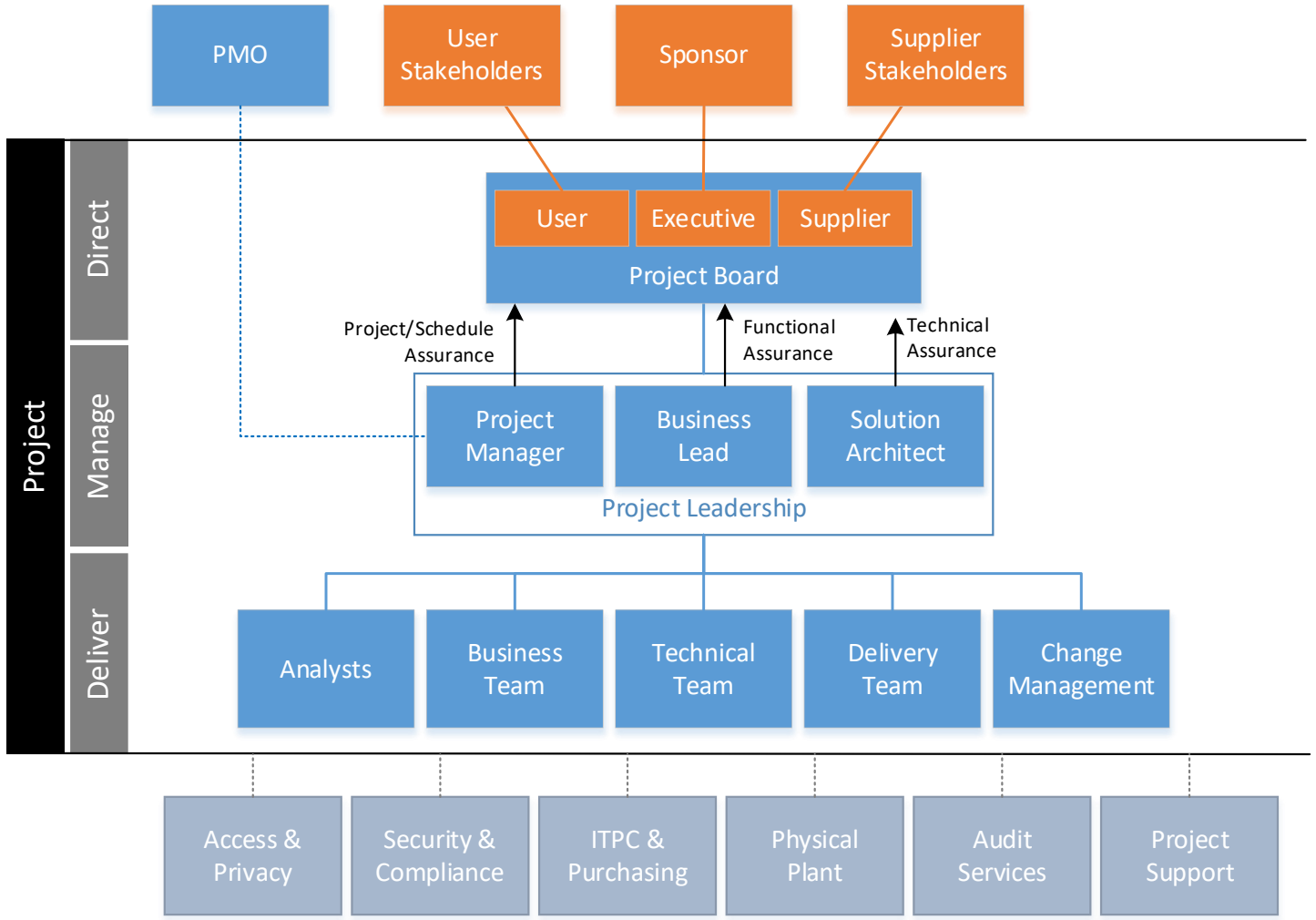
How did we get here?

- Commitment of 6 positions by CIO in 2016
  - Design and Architecture done informally prior to this
  - Recognized need to provide more focus, expertise, and continuity
- Architecture Board formed in 2018
  - Reviews Architecture Visions, Architecture Decision Requests, and standards
  - Meets bi-weekly
- Current Team
  - Banner Program Architect
  - Identity Architect
  - Data Architect
  - Infrastructure Architect
  - Solution Architect
  - Infrastructure/Network Architect
  - Director, Planning and Governance (Non-voting member)
- Up to this point we have been a responsive practice that responds to projects/initiatives

IT Architecture
and Project Teams

The Solution Architect is the technical lead on projects and owns the solution. This complements the PM who owns process and the Business Lead who owns the benefit.

A project is any piece of time boxed work. Some projects require formal governance and formal project structures, other smaller pieces of work can still follow project methodologies.



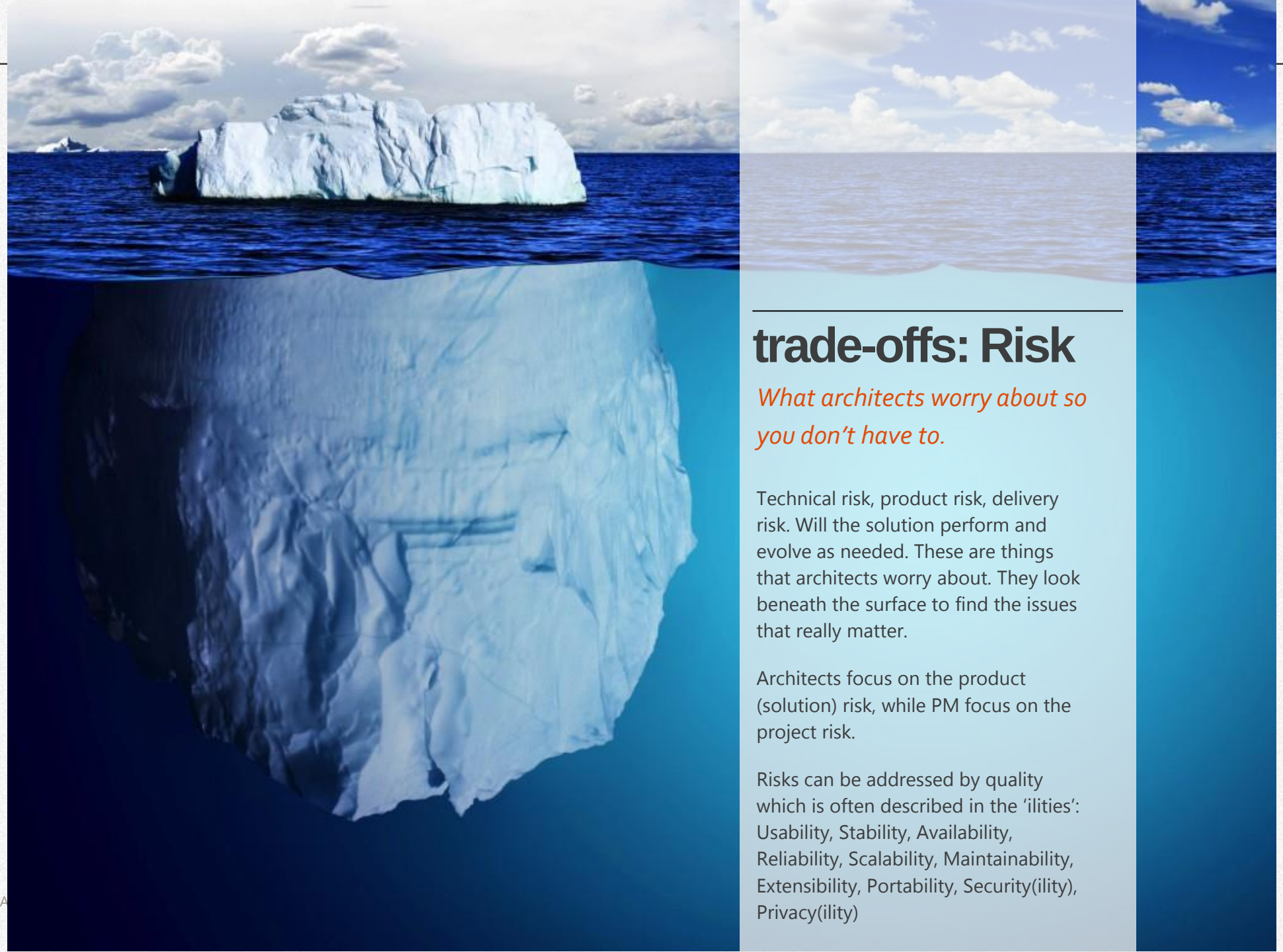
IT Architecture Practice
the conflicts

So what do we do when people don't agree?

- Project Board controls scope/budget of projects
- Architects present design and recommendations to the Project Board based on expertise and experience – not considering budget
- Many times the recommended solution may not be able to fit in scope/schedule/budget of project
  - Significant exceptions require the Project Board to request an Architecture Exception that needs to be approved by CIO
  - In 4+ years we have not had an exception request
- Our primary challenge is we integrate rather than develop
  - Our list of preferred solution/integration options can be limited

IT Architecture
Themes

At U of M, The Architecture practice focuses around 7 major themes.



trade-offs: Risk

What architects worry about so you don't have to.

Technical risk, product risk, delivery risk. Will the solution perform and evolve as needed. These are things that architects worry about. They look beneath the surface to find the issues that really matter.

Architects focus on the product (solution) risk, while PM focus on the project risk.

Risks can be addressed by quality which is often described in the 'ilities': Usability, Stability, Availability, Reliability, Scalability, Maintainability, Extensibility, Portability, Security(ility), Privacy(ility)

Roadmap

The general who wins a battle makes many calculations in his temple before the battle is fought. The general who loses a battle makes but few calculations beforehand. Thus do many calculation lead to victory, and few calculations lead to defeat.

– Sun Tzu, the Art of War

Plans are nothing; planning is everything.

- Dwight D. Eisenhower

The roadmap is a cornerstone deliverable of IT architecture. It is an articulation of the destination and the path to get there.

Destination

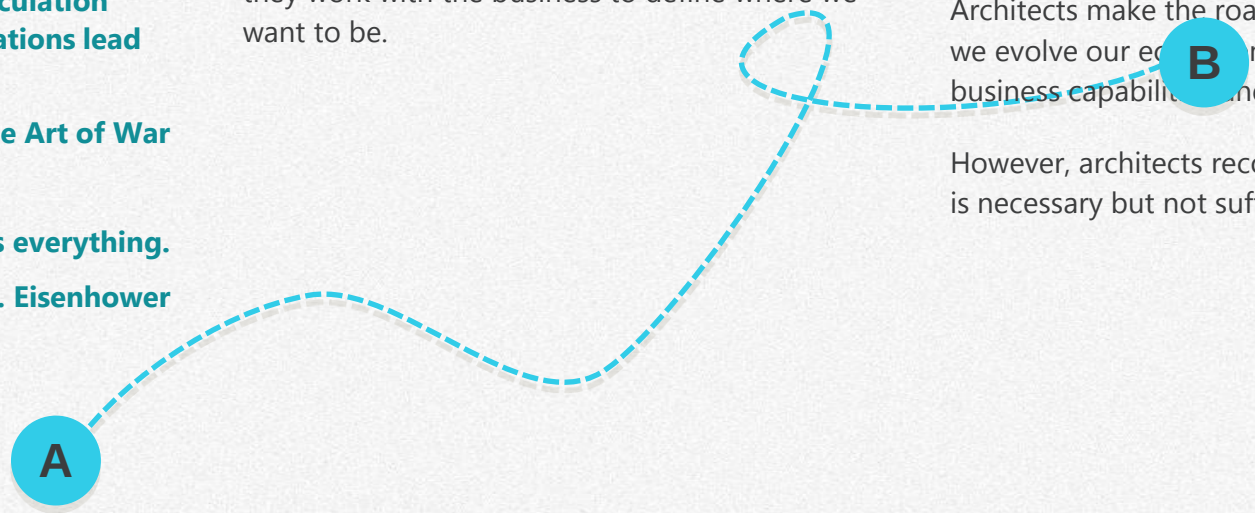
To determine where we are going, architects need to consider the whole context of where we are, the needs of the institution now and in the future, the technology and business resources we have now and may have in the future, the trade-offs of cost and risk, the capabilities we have, and those we want to have. Considering all this and more they work with the business to define where we want to be.

Path

The old saying "its not the destination, it's the journey" rings true here. How we get to where we want to be is as important as where we want to be. The trajectory that we need to follow to hit our target is never a straight line from A to B. The technology and business changes required - the waypoints on the road – are critical because they address the business and technical ability to adapt to the change: the speed at which we can inject innovation into the institution.

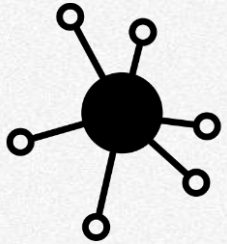
Architects make the roadmaps that we follow as we evolve our ec m in both terms of business capabili nd technical infrastructure.

However, architects recognize that, while the plan is necessary but not sufficient.



The Purpose
of IT Architecture

Capture, connect and visualize the University's information technology ecosystem in a way that allows for **meaningful planning** and **informed decision making**.

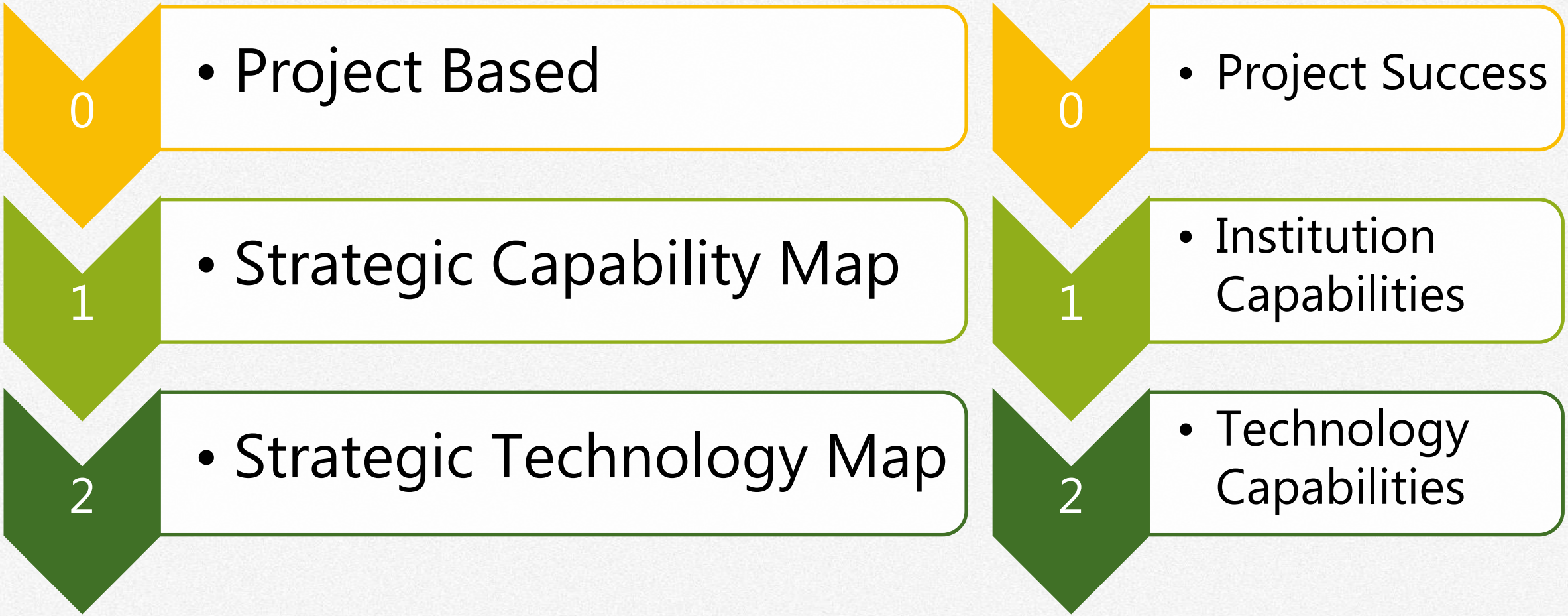


Through **standardization** and **integration**, promote an information technology ecosystem focused on, and enabling of , **business capabilities**.

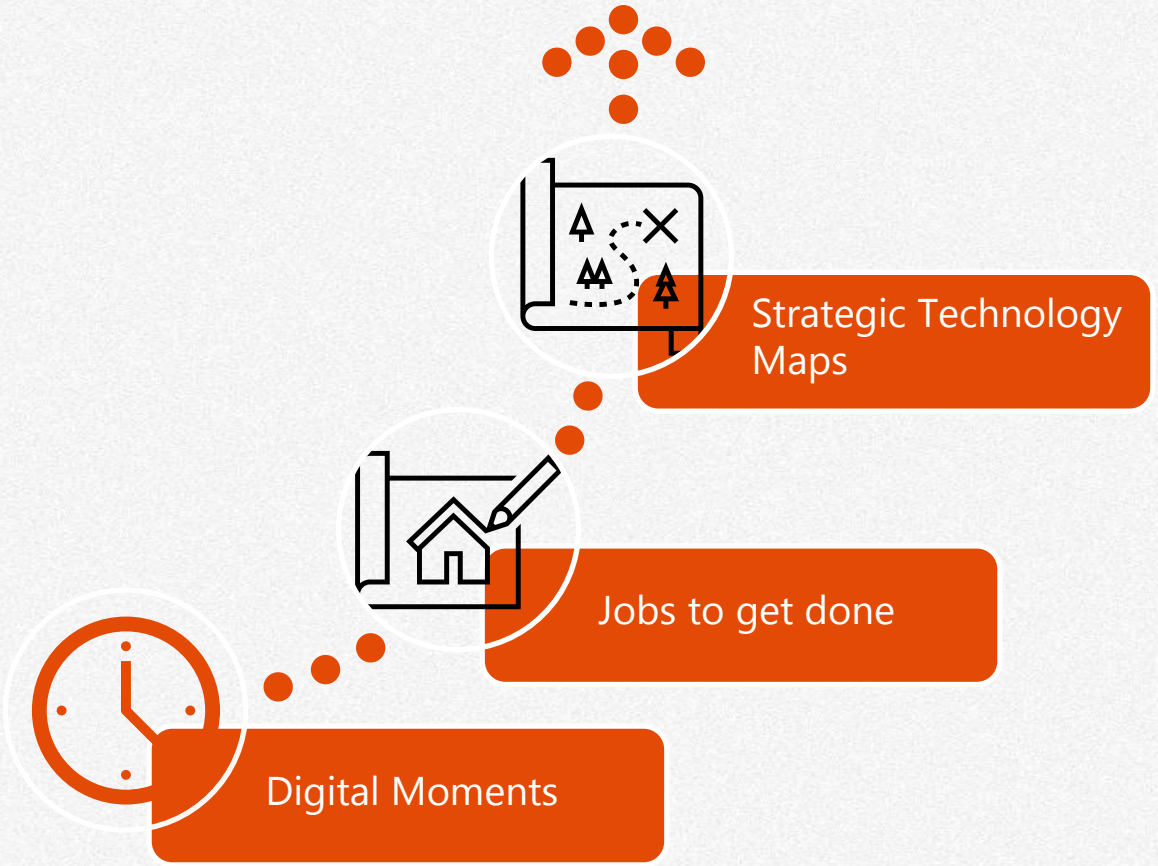
Articulate the path using **roadmaps** that moves the technology ecosystem and institutional capabilities forward, applying **innovation** and balancing **trade-offs.**

Provide **technical direction** and **leadership** though establishment of **standards, solution design** and **project execution**.

IT Strategy/Architecture Next Generation



IT Strategy/Architecture Technical Capabilities



How do we practice IT Architecture?

David

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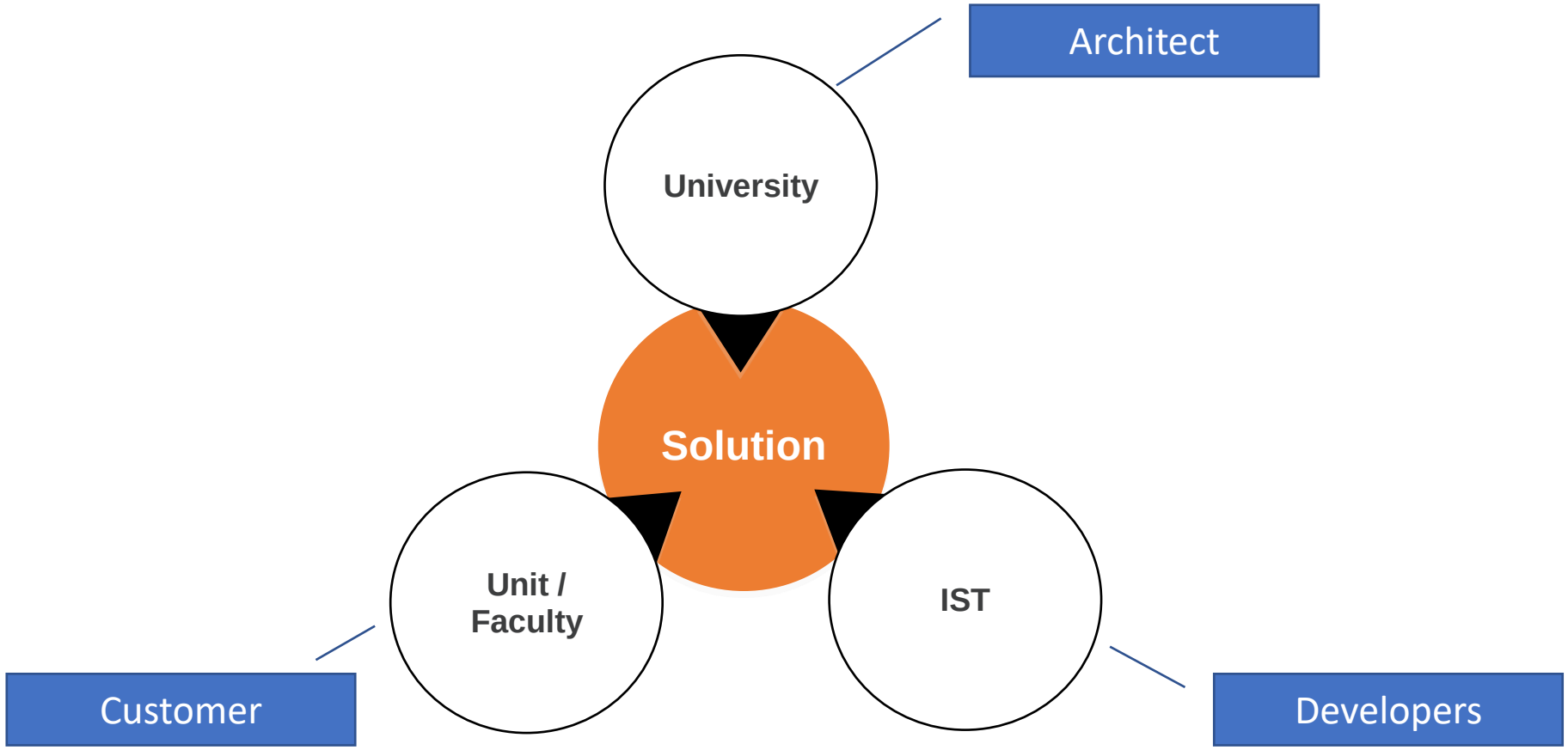
Architect
University
Solution
Unit /
Faculty
IST
Customer
Developers

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IT Projects at UManitoba

Plan

Estimate Cost & Effort

Project Proposal

Acquire Funding

Build

Finalize Solution

Implement

Define Support

Run (Maintain)

Minor enhancements, fixes, and upgrades

Support customer

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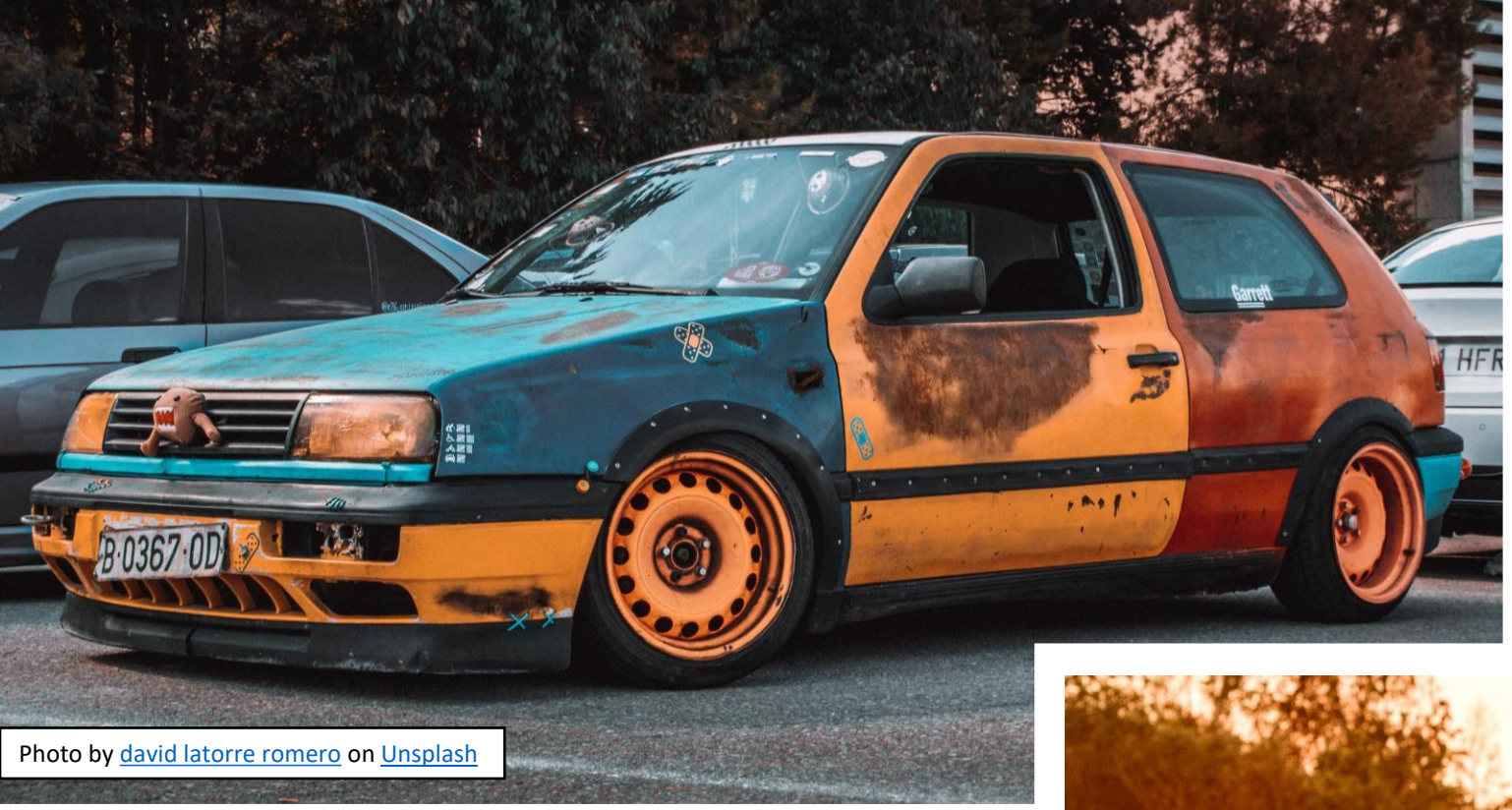

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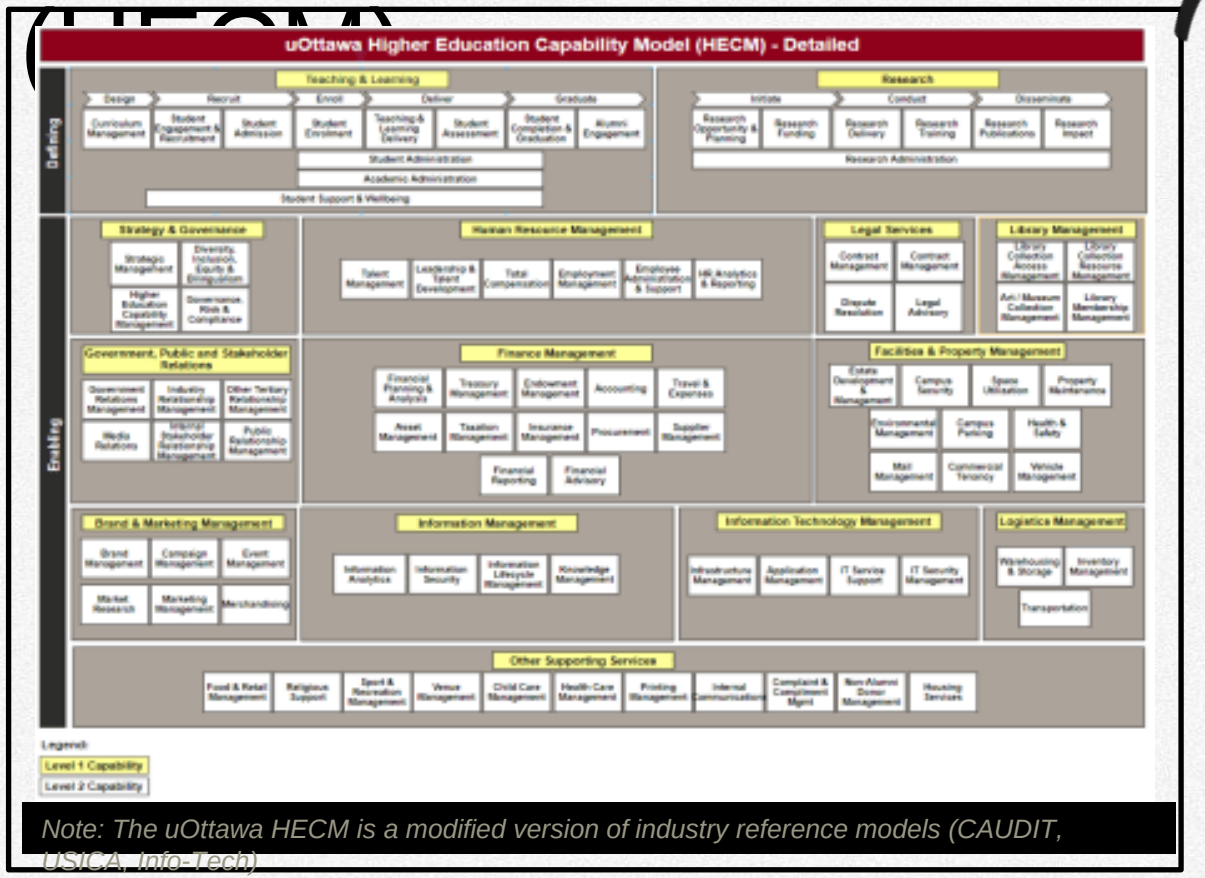
What would we do differently?
What are our next steps?

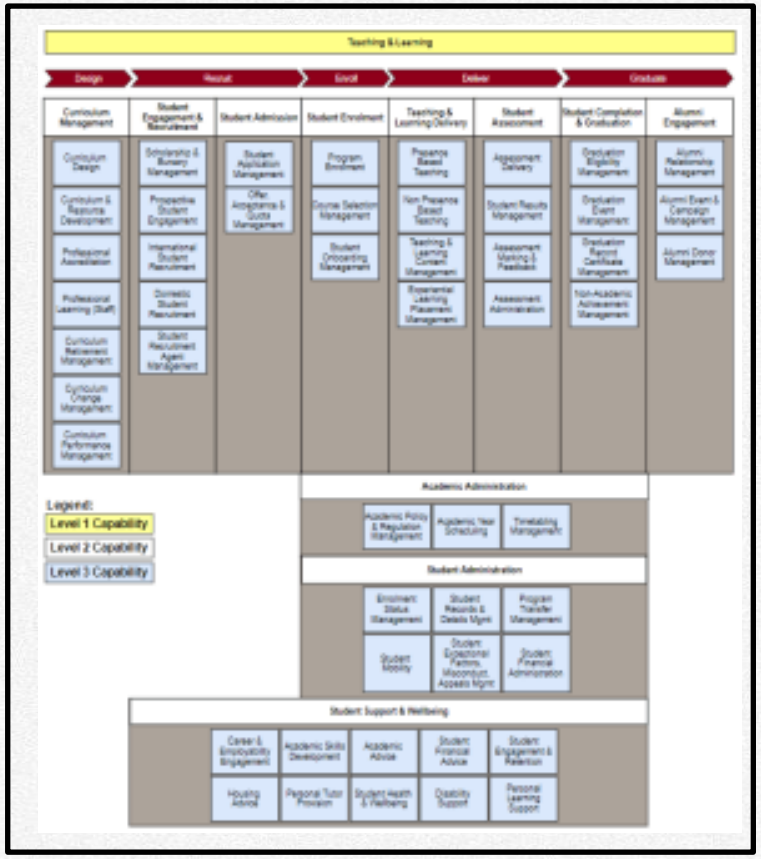
Terry & David

uOttawa's Higher Education Capability Model (HECM)



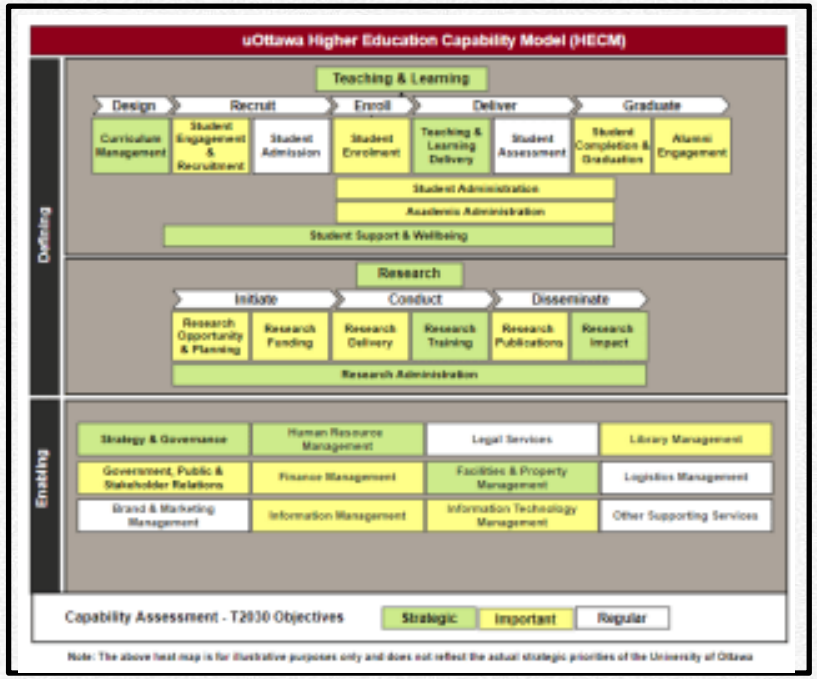
Note: The uOttawa HECM is a modified version of industry reference models (CAUDIT, USICA, Info-Tech)

Drill down to lower-level capabilities



View capability definitions

Capability Based Planning

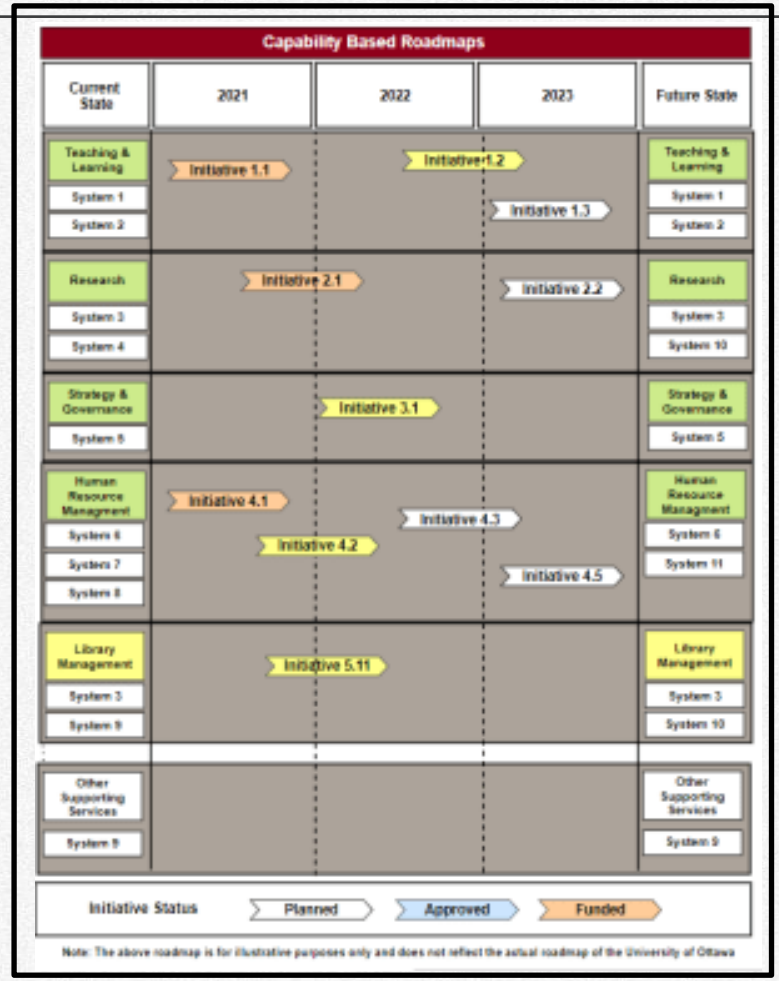


CAPABILITY BASED ROADMAPS

Organized around business capabilities, linking strategy & execution

KEY BENEFITS

Alignment between IT investments and long-term business outcomes, Proper scheduling of IT initiatives, Better synchronization of business and IT related plans



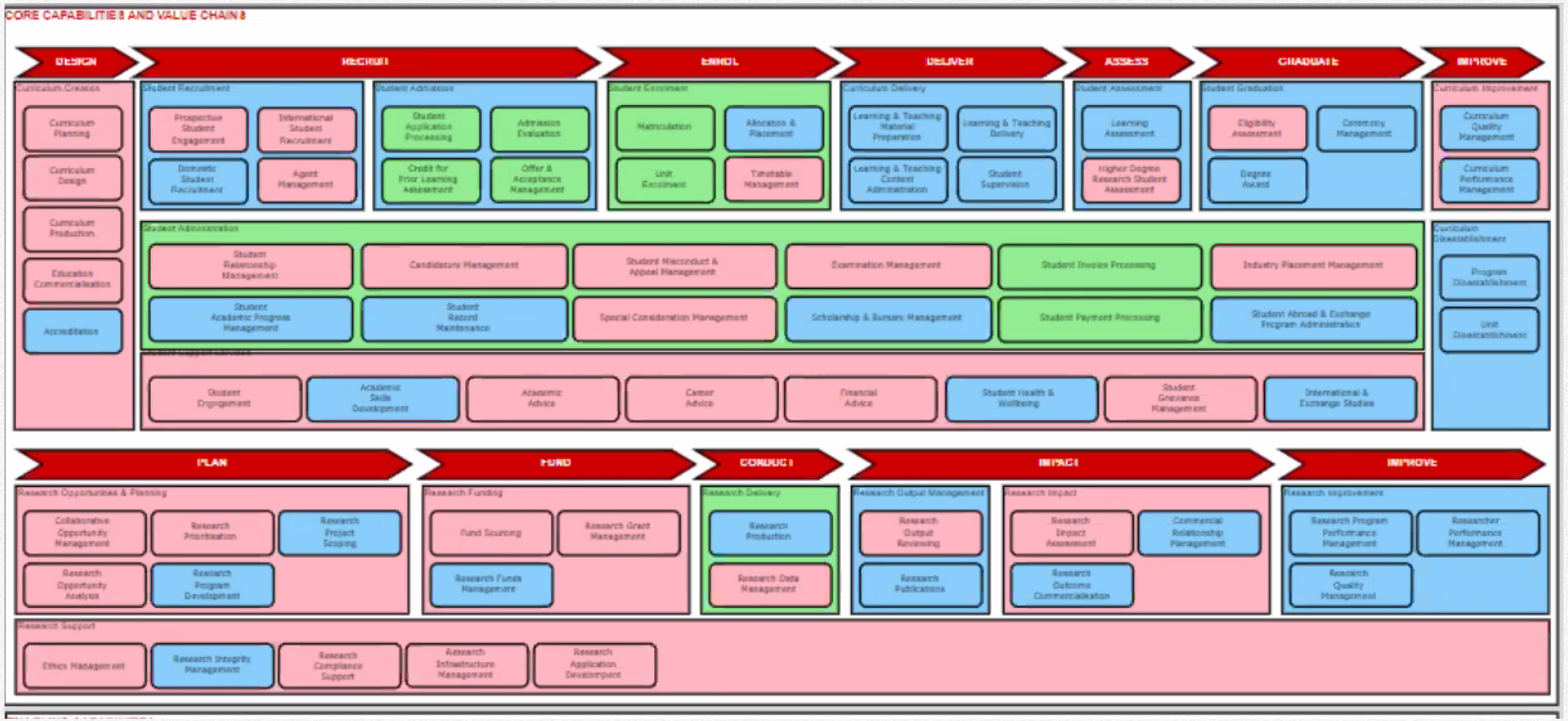
STRATEGY

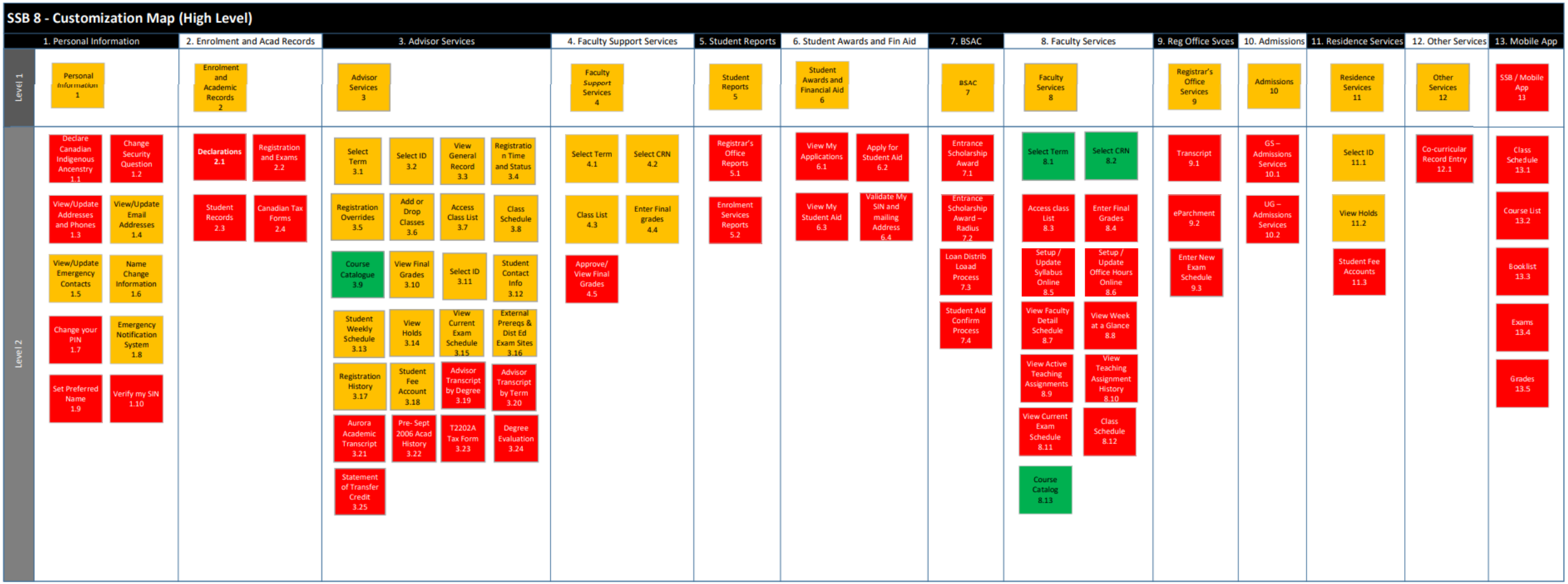
BUSINESS CAPABILITY MODELS
Help business executives decide WHERE future IT investments should go.

EXECUTION

CAPABILITY BASED ROADMAPS
Operate with planned IT initiatives and help business executives decide WHEN these investments should be made

U of M Capability Map Concept





Baseline

Modifications

Customizations

What did you (hopefully) learn?

What did you learn?

From the Macro-Level (Terry)

- What a sustainable Architecture practice looks like
- How to balance Architecture and project decisions
- Power of Capability Models and Digital Moments

From the Micro-Level (David)

- Represents the “big picture” and the “long term”
- Informs Stakeholders and Governance Structures
- Aims to provide standardization and awareness

To Be Continued

- From Custom COTS to Cloud: A Case Study in Solution Architecture
  - **Tomorrow @ 1pm in A3**
  - They said it was impossible. They said it couldn't be done. They said they would never move our customized commercial off the shelf (COTS) application and move it into the cloud. They were not a Solution Architect. Learn what it takes to do the impossible and modernize your COTS development.

Who are "we" exactly?

Terry Bunio

- Director, Planning & Governance at University of Manitoba
- Role
  - Translating vision into strategy
  - Setting direction

David Wesst

- Solution Architect, UManitoba
- Role
  - Implementing strategy and informing its evolution
  - Implementing direction and aligning leading tacticians

Questions (and Thank You)