

# Using Enterprise Architecture as a template of analysis

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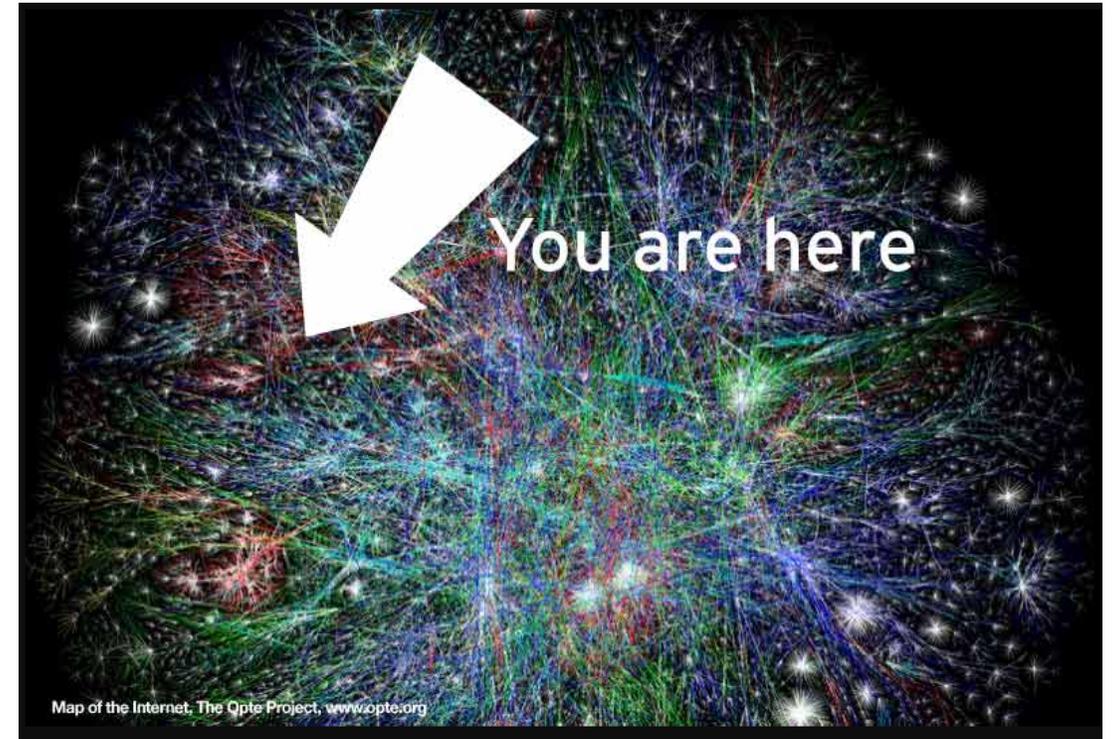


# Outline

1. Background information
2. Phases of the study
3. Brief introduction to enterprise architecture
4. Design of an integrated TOGAF Framework
5. Concluding remarks

# 1. Background information

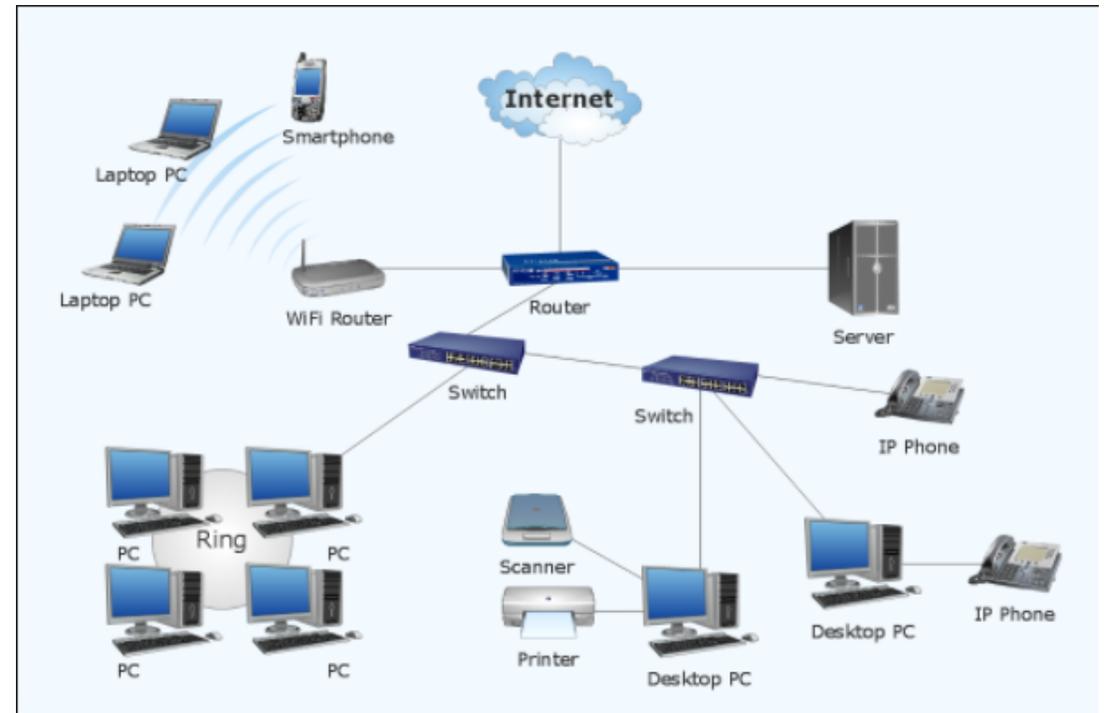
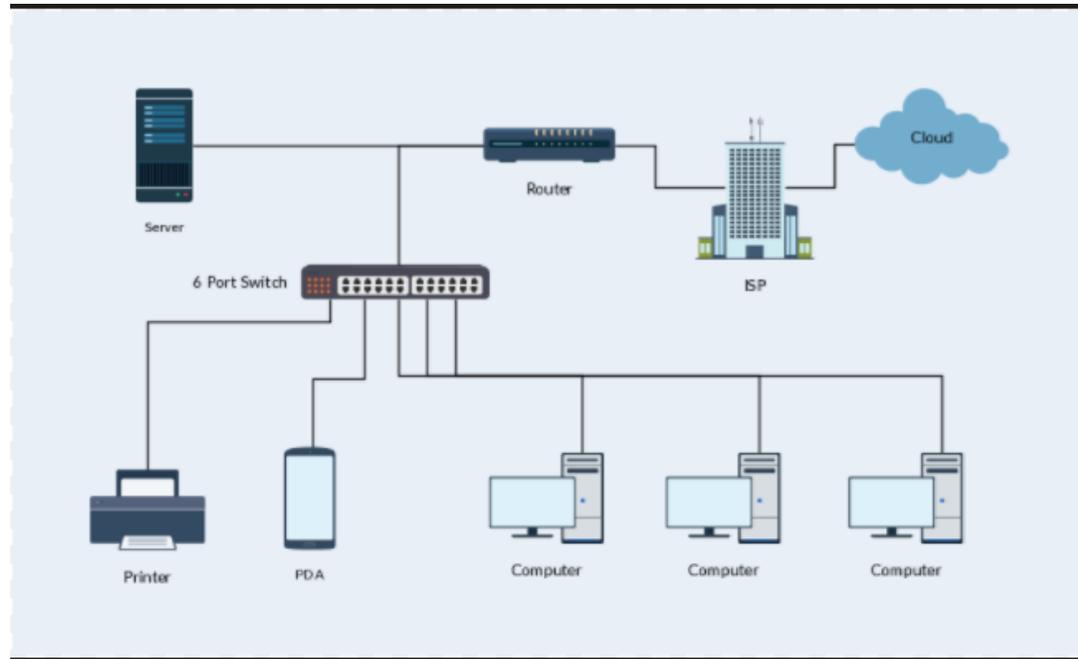
- Modern institutions use different kinds of complex business applications (i.e. computer systems or programmes) to support organizational activities that fulfil their institutional mandate.
- Often these business applications run on a variety of technology platforms either on premise or using cloud computing services.
- In the past information technology (IT) professionals would be able to provide a simple diagram of the business applications but that is difficult with the increasingly complex environment.



Increasingly we may feel like Alice in Wonderland, having fallen into a rabbit hole into a fantasy world populated by peculiar “anthropomorphic systems” (e.g. Artificial Intelligence systems).

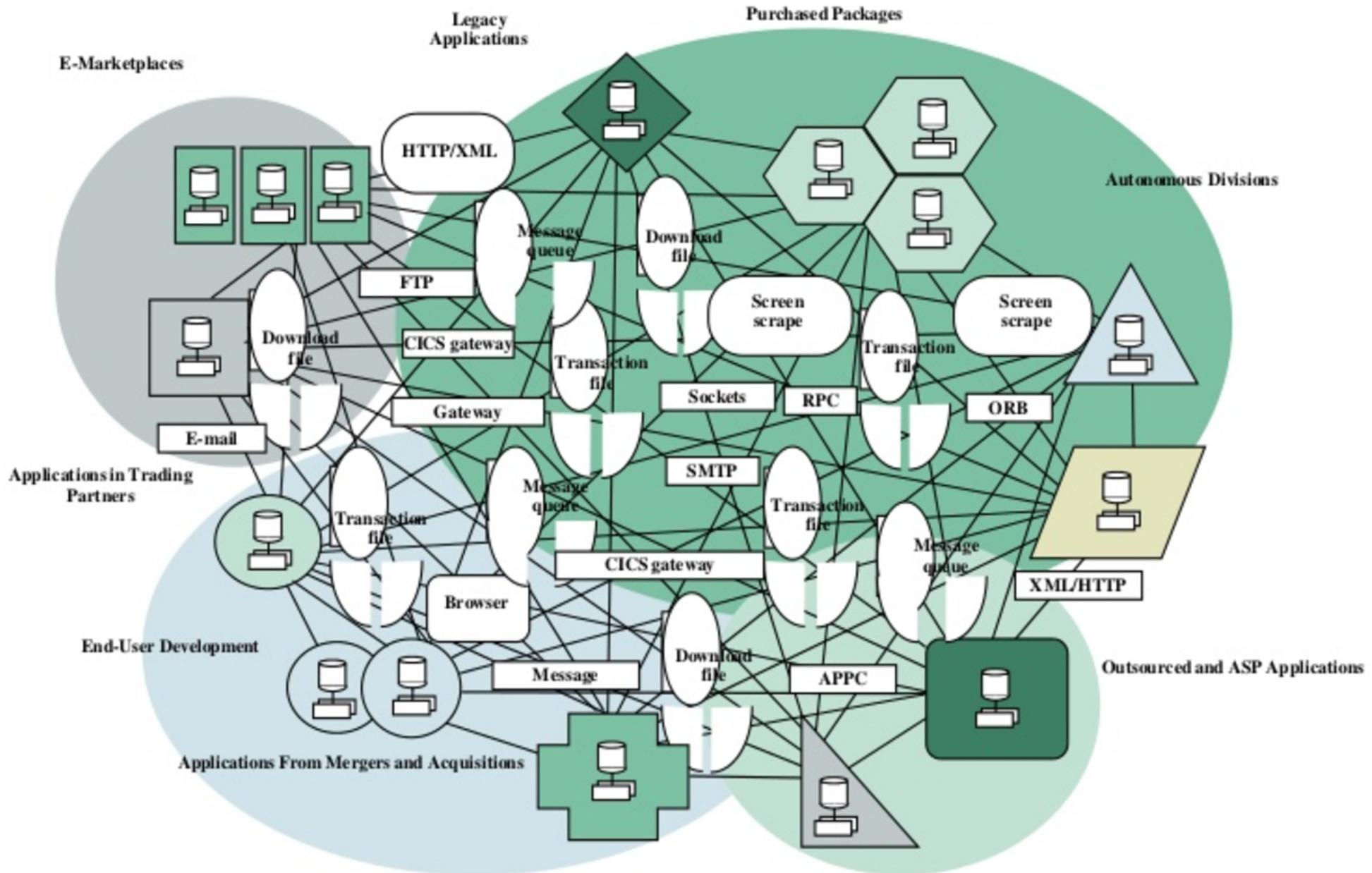
# 1. Background information

## Business applications: simple diagrams





Other organizations make an effort to label all the components



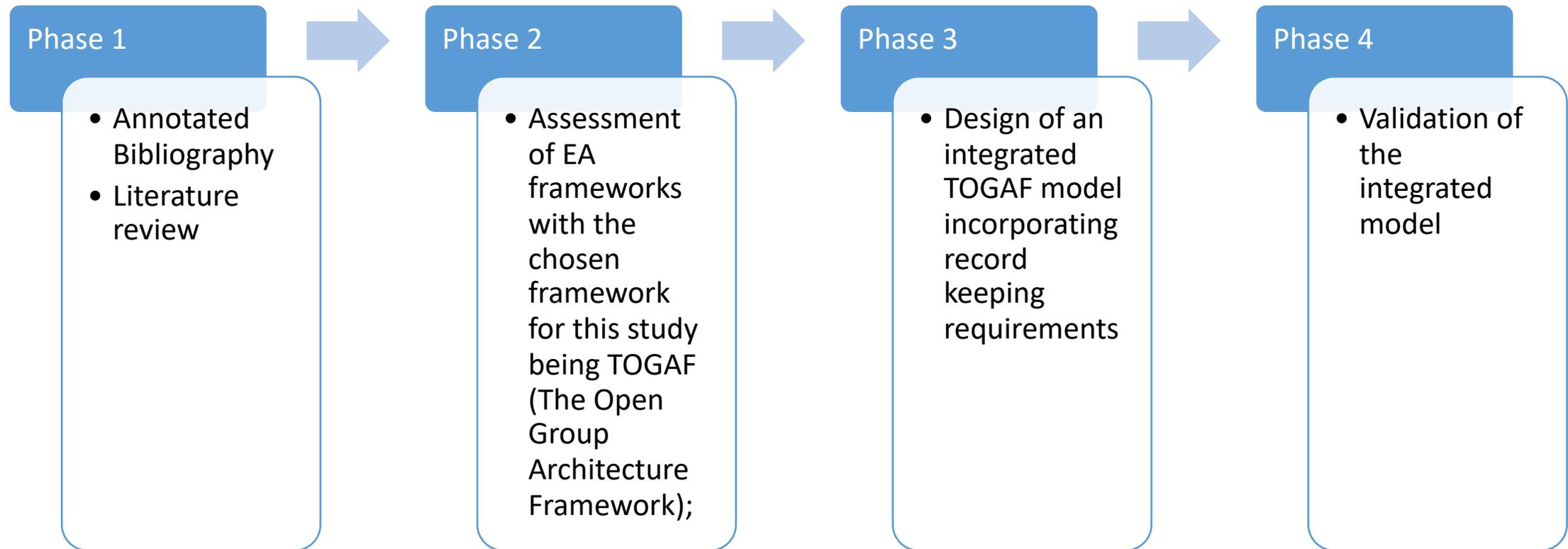
Source: IASA Spain, 2014

# 1. Background information: Records professionals working in complex technological environments

- For records professionals in institutions with a complex technological environment, the challenge is how best to understand the complexity in a way that they can fulfil their professional mandate, the identification, capture and management of records for as long as they are required.
- Records professionals need to make sense of the vast array of business applications as well as technological infrastructure and how they are connected with each in supporting the institution's functions and activities.
- This is necessary in order to institute any lifecycle manage of records or potential records generated by these business applications.
- The information technology field has a number of options to understanding the technological complexity, one being enterprise architecture.
- This presentation is drawn from InterPARES Trust case study TR04 conducted within the Transnational team that investigated enterprise architecture as a template of analyzing this technological complexity.

## 2. Phases of the study

The overall study constitutes four components:



### 3. Brief introduction to enterprise architecture

- Enterprise Architecture (EA) emerged in the 1980s as a way to deal with institutional complexity in an increasingly sophisticated organizational environment (Ahlemann, Legner, & Schafczuk, 2012, p. 3).
- EA allows for the vertical integration of strategic direction with tactical concepts, design decisions, and operations but also allows the horizontal alignment of business changes with technology and vice versa (Stettiner & Messerschmidt, 2012, p. 61).
- EA models differ from pure business process models as they holistically describe related enterprise capabilities and different layers' assets.

### 3. Brief introduction to enterprise architecture

## Enterprise Architecture: comparable to urban planning



#### Lack of Urban Planning

- Public transit, parks, schools are after thoughts.
- Inefficient, siloed everyone out for themselves.
- No common services.
- No rules, standards or policies
- Not scalable; growth is constrained



#### Good Urban Planning

- Future looking: planning and analysis
- Efficient, governed, planned constructions
- Common Services (streets, schools, utilities)
- Standards (fire, safety, quality)
- Organised, structured, scalable for growth

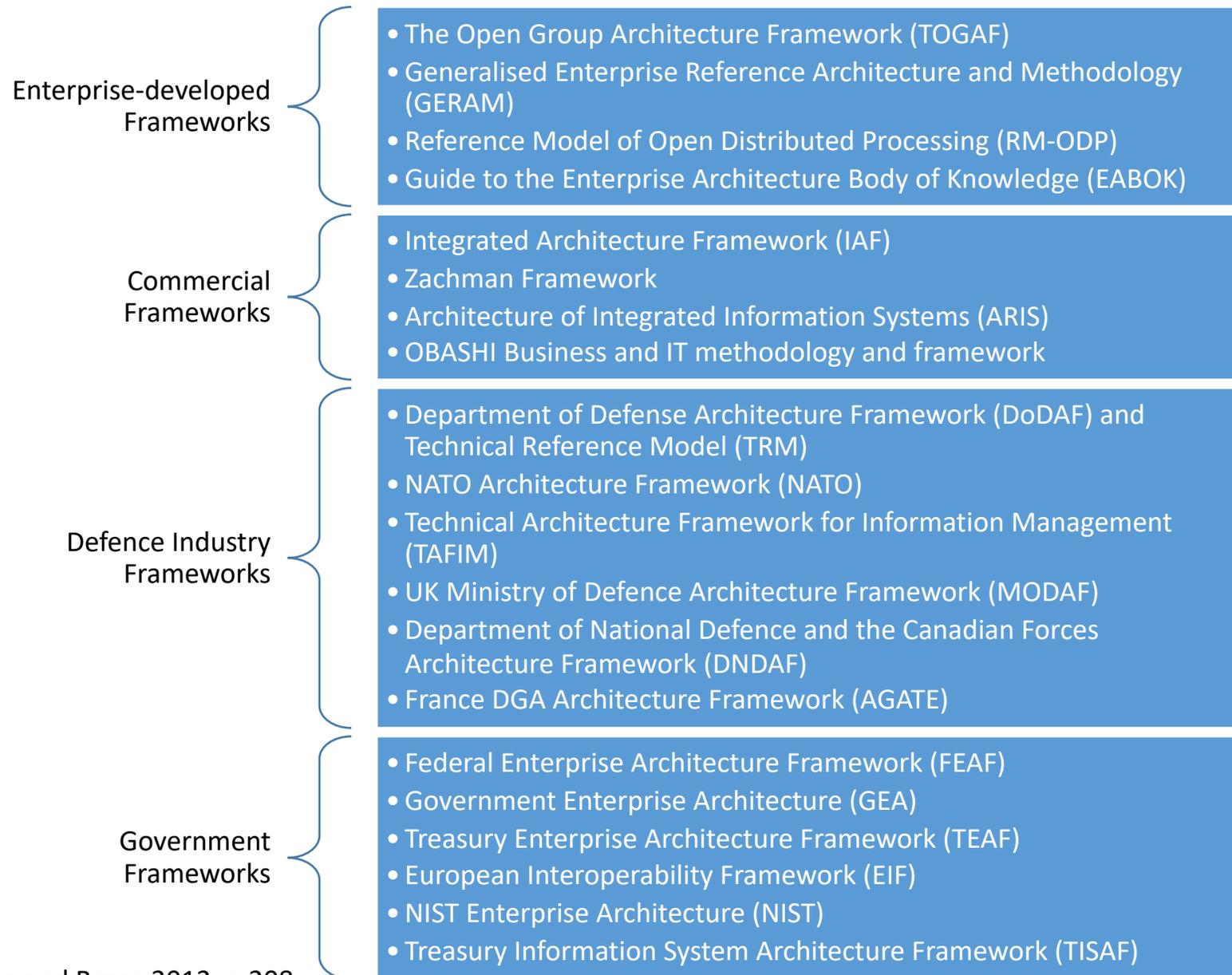
Source: New South Wales Government, 2017

# 3. Brief introduction to enterprise architecture

- Individual countries have been adopting EA at different paces and levels of sophistication.
- For instance, in the late 1990s and early 2000s, several public sector experts in Australia recognised the potential for EA's utility to assess the management of data and information in local councils (Local Government Association of Tasmania, & School of Information Systems [University of Tasmania] 2003).
- In the course of the 2000s, Canada embedded EA principles within the federal government with the chief architect's office located within the Treasury Board Secretariat (Doucet 2008).
- Similar trends are seen in countries in the global periphery such as South Africa and Kenya.
- While different countries are at varied levels of sophistication, the situation amongst records and archives specialists remains (mostly) vague.
- The most visible efforts have been through the standardization process. Around 2016, records professionals in ISO's Technical Committee 46 Sub-Committee 11 embarked on creating a common reference for records professionals and enterprise architects titled "*Records Requirements in Enterprise Architecture*" covering requirements for records processes and systems (International Standards Organization 2018)

### 3. Brief introduction to enterprise architecture – a primer on TOGAF

- Since the mid-1980s, EA practitioners developed more than two dozen frameworks, including the Zachman Framework, TOGAF, and the Federal Enterprise Architecture (FEA) framework.
- These frameworks are popular because of their maturity. Zachman is the oldest; TOGAF and FEA allow free access to resources and information.



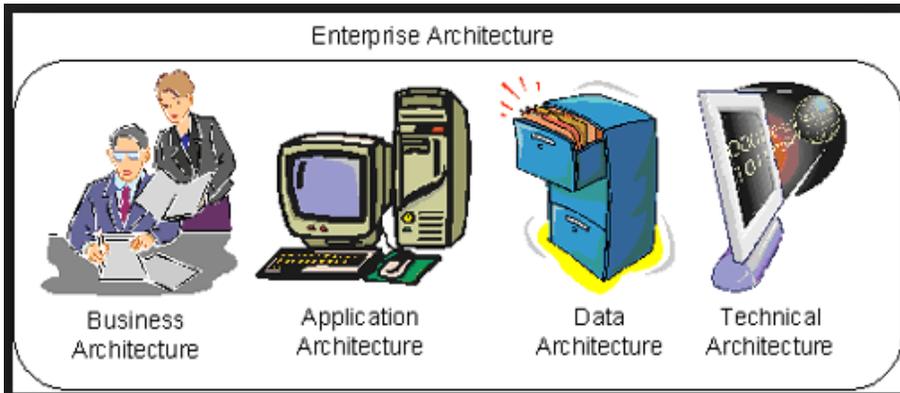
Source: Basten and Brons 2012, p.208



# 3. Brief introduction to enterprise architecture – a primer on TOGAF

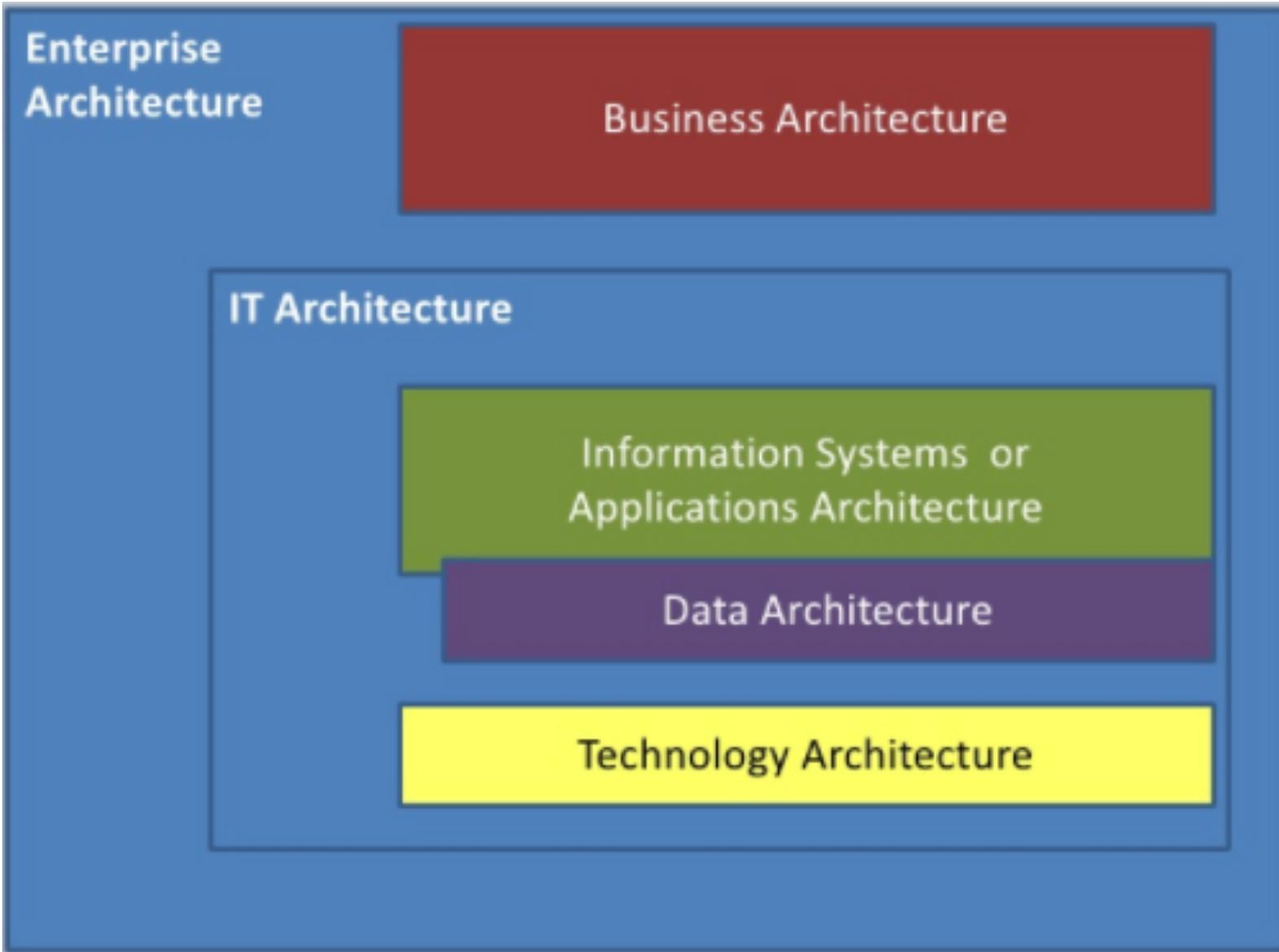
- TOGAF was created by The Open Group as a technology architecture methodology based on an older framework known as TAFIM - Technical Architecture Framework For Information Management (Armour, F. J. et. al 1999)
- TOGAF has three main pillars:
  - Architecture Development Method (ADM): This describes a method for developing and managing the lifecycle of an EA and forms the core of TOGAF.
  - Enterprise Continuum (EC): This provides methods for classifying architecture and solution artifacts, both internal and external to the architecture repository, as they evolve from generic foundation architectures to organization-specific architectures.
  - Enterprise Architecture Domains (EAD): These are areas of specialisation that are commonly accepted as subsets of an overall EA. These domains are
    - business architecture,
    - applications architecture,
    - technology architecture, and
    - data architecture.

### 3. Brief introduction to enterprise architecture – a primer on TOGAF



Within TOGAF's enterprise architecture domains are four interrelated areas of specialization:

- **Business architecture** which defines the business strategy, governance, organization, and key business processes of the organization
- **Applications architecture** which provides a blueprint for the individual systems to be deployed, the interactions between the application systems, and their relationships to the core business processes of the organization with the frameworks for services to be exposed as business functions for integration
- **Data architecture** which describes the structure of an organization's logical and physical data assets and the associated data management resources
- **Technical architecture, or technology architecture**, which describes the hardware, software, and network infrastructure needed to support the deployment of core, mission-critical applications.



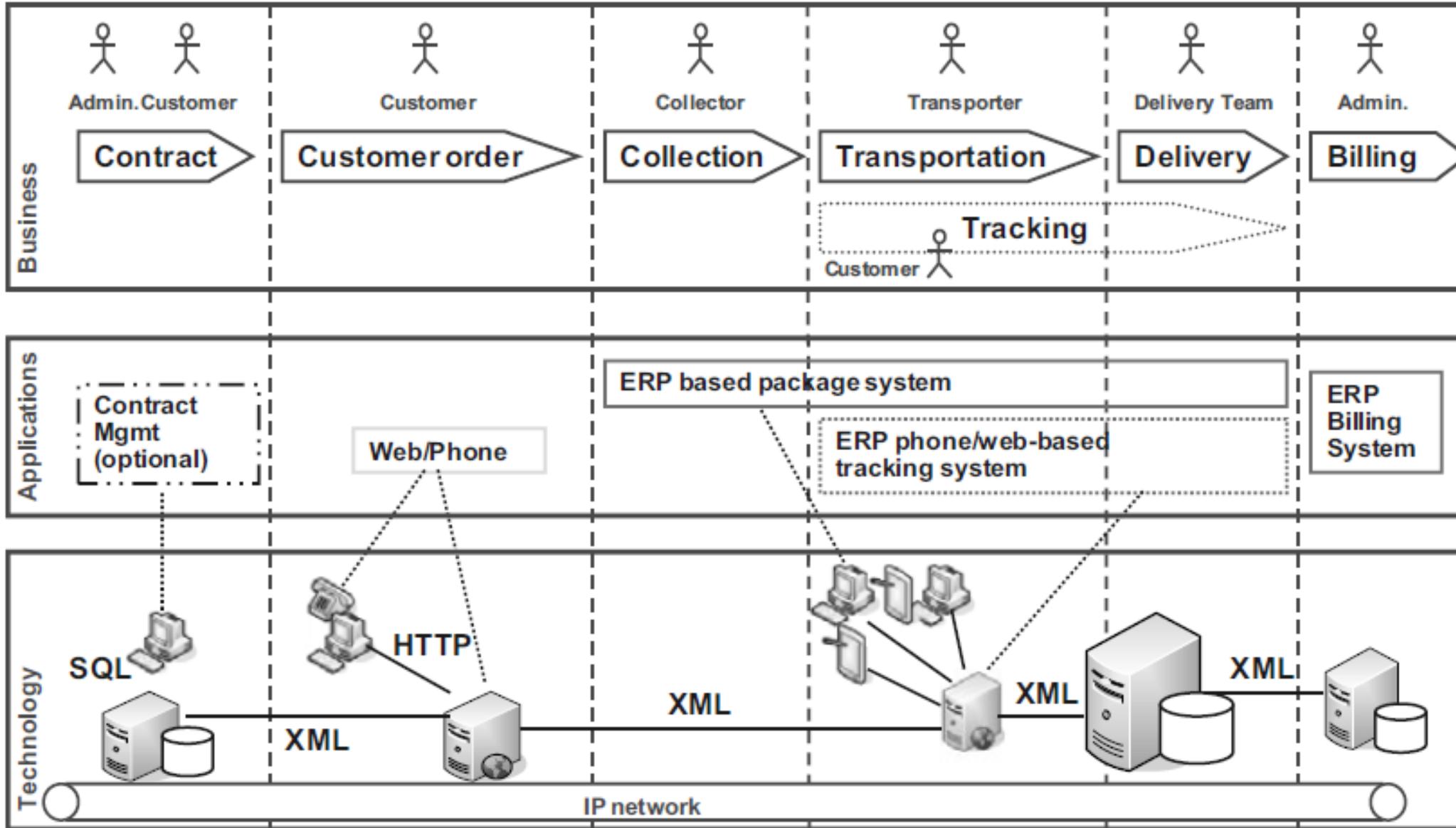
How the business is organised to met its objectives

How the information System support the objective of the business

Structure of the data assets

How the technology fits together

Source: Sullivan, 2011



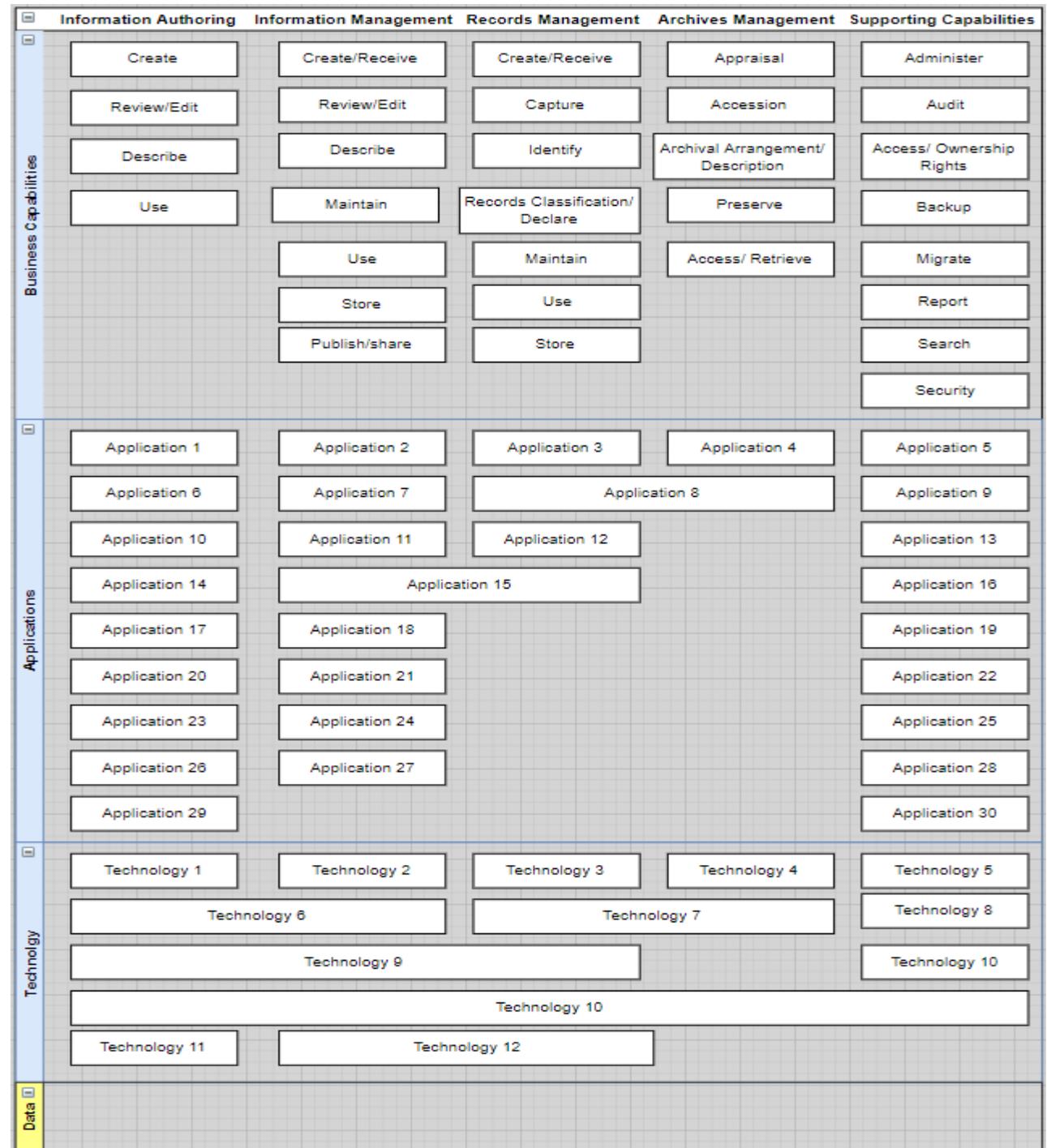
Source: Basten & Brons, 2012, pp. 215-216

# 4. Design of an integrated TOGAF Framework

- In TR04 the research team is exploring the utility of TOGAF architecture domains in an institutional setting.
- In the research, the TOGAF EAD was expanded to accommodate a modified form of the records/archives and information lifecycle model. The normal lifecycle model usually constitutes creation or receipt of records or information, their capture, storage and maintenance, use, and disposition.
- The modified lifecycle within the institutional setting has four phases:
  - information authoring
  - information management;
  - records management; and
  - archives management.

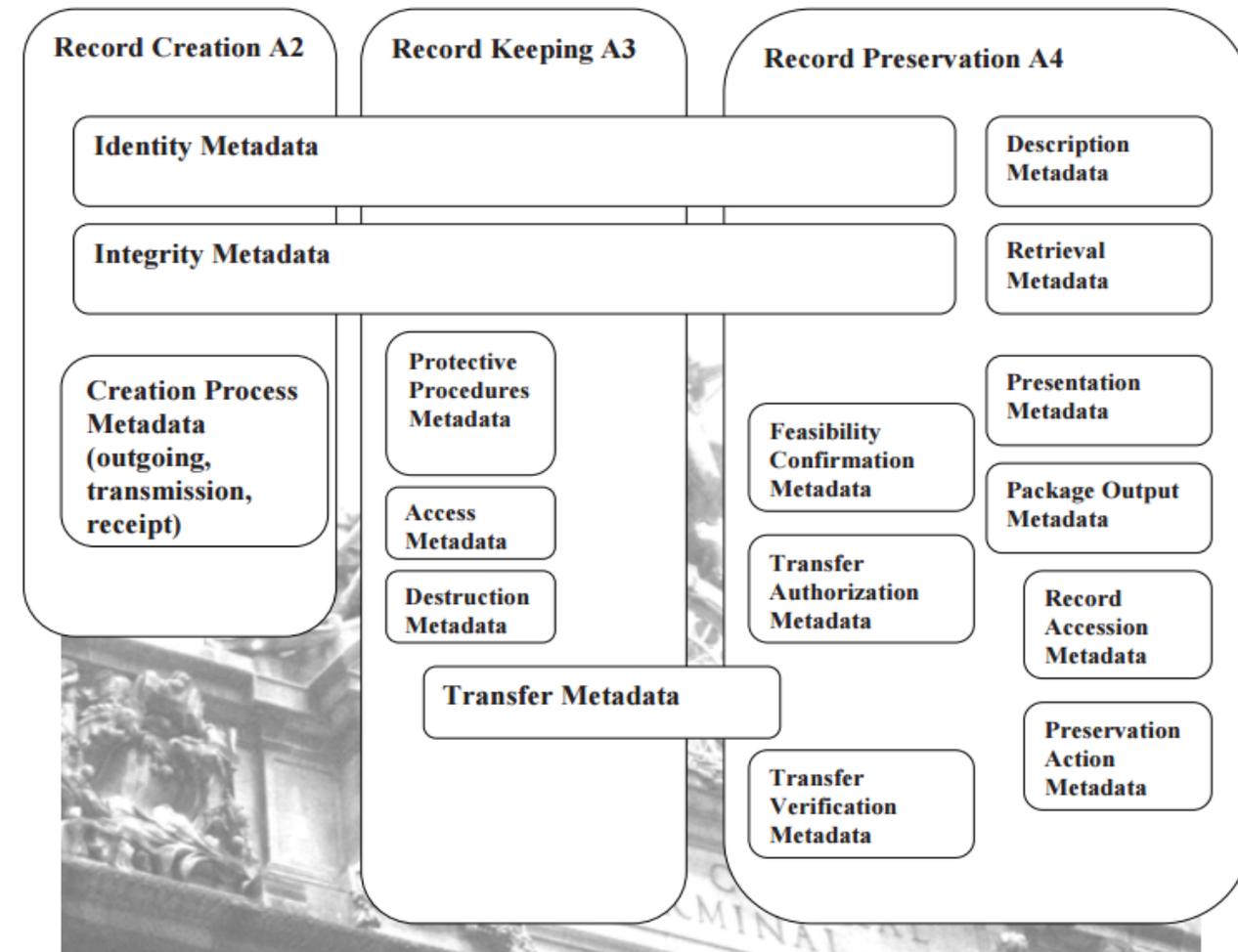
## 4. Design of an integrated TOGAF Framework

- Each of the four phases of the lifecycle has a swim lane through the four layers of the framework.
- An additional swim lane, titled supporting capabilities, was added to accommodate aspects of the business capabilities that cut across all four phases
- The resulting framework for the institution has anonymized names for applications and technologies



## 4. Design of an integrated TOGAF Framework

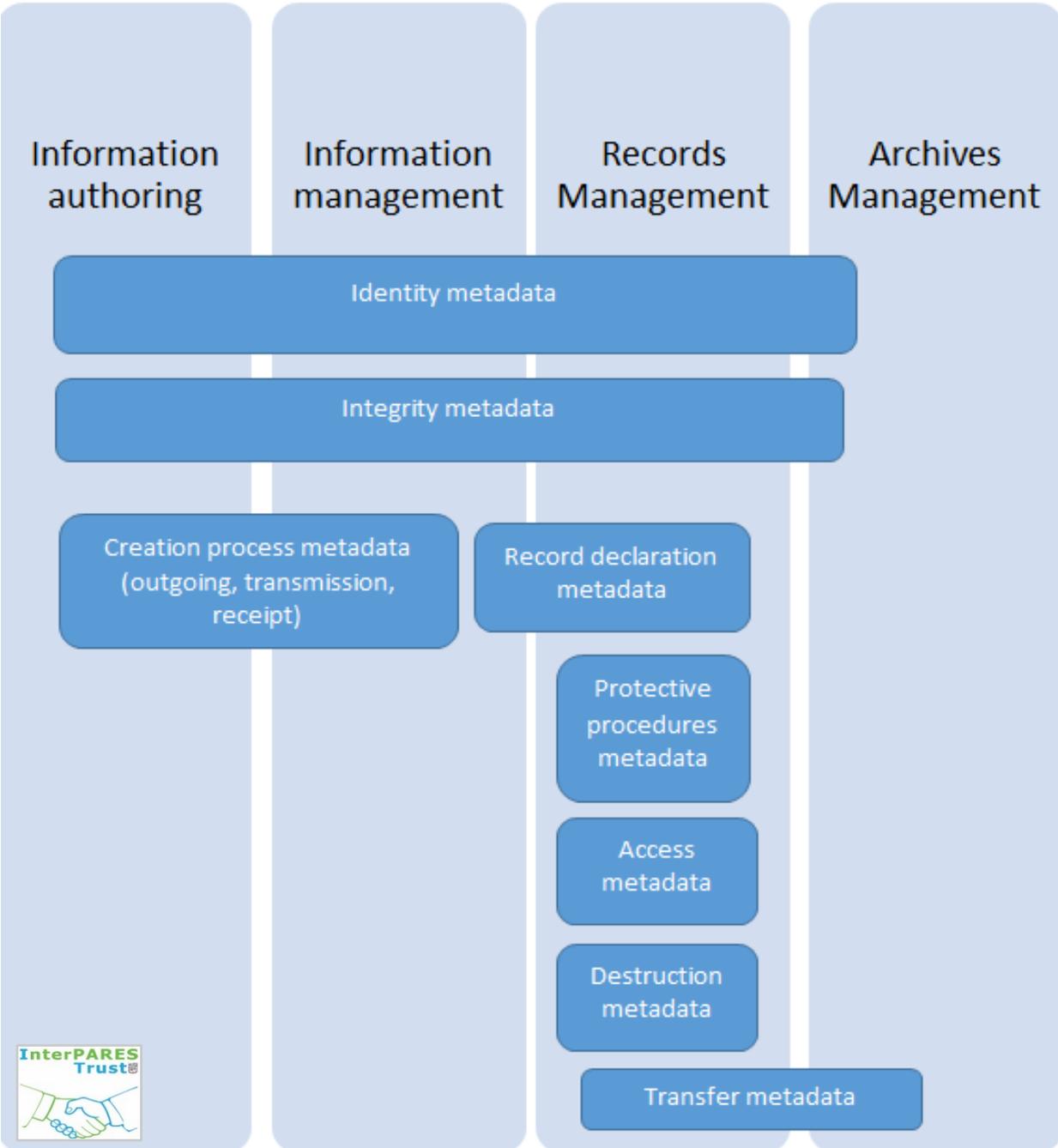
- The gap on the fourth layer caused concern when building the components of the framework.
- As a result, the institutional decision was to develop metadata attributes to facilitate the assessment of content in the other layers.
- These attributes were adapted from a previous phase of the InterPARES project which had developed a framework for identifying authenticity metadata.
- In the InterPARES project, the metadata components were mapped over three stages of the lifecycle model. In order to adapt to the data layer of the TOGAF, the metadata attributes were extended to cover all four swim lanes (InterPARES 3 2012)



Joseph T. Tennis | SLAIS@UBC

The illustration demonstrates the metadata categories mapped over the three stages of the records lifecycle.

Source: Tennis, 2006



- The resultant model mapped the metadata categories across four of the five swim lanes.
- Identity metadata e.g.
  - Name of author/writer
  - Name of address (if applicable)
  - Name of originator (if applicable)
  - Name of receiver/recipient
  - Name of action
  - Indication of forms of authentication
- Integrity metadata e.g.
  - Indication of protective procedures used to prevent corruption of the presented information asset
  - indication of any redaction for privacy, copyright or any other reasons
- Record declaration metadata e.g.
  - Classification code
  - Registration number (i.e. unique identifier)
  - Name of creator
  - Indication of intellectual rights
  - Name of handling office
  - Name of office of primary responsibility

# 5. Concluding Remarks

- The data layer, when incorporated in the larger model, offers several benefits.
  - It provides a general overview of how components in the layers are connected.
  - For institutional stakeholders, the data layer provides an objective and consistent manner to assess metadata requirements implemented in the business applications and technology platforms in the other layers of the framework.
- Overall, the EA model provides an overview of how each of the components are connected and to what extent they straddle swim lanes in the framework
- This presentation is drawn TR04 case study that constitutes four phases, concentrating on the research done in the first two phases.
- It has demonstrated how an EA framework based on the TOGAF framework assessed an institutional model with four layers: (1) business capabilities; (2) application; (3) technology; and (4) data.
- The data layer was blank. Therefore, the research study offered an opportunity to adapt metadata categories and types.

# 5. Concluding Remarks

- As an ongoing research process, the study will continue with the third phase by completing the design of the integrated TOGAF conceptual model. This model should be built incrementally as it considers the conceptual contribution from recordkeeping. The fourth and final phase would validate the integrated TOGAF conceptual model.
- This study differs from the work currently being undertaken by ISO's TC46/SC11 that has also chosen TOGAF to explore its relevance within the records and archives profession in the following ways:
  - This study looked exclusively at TOGAF. TC46/SC11 used TOGAF in conjunction with ArchiMate.
  - This study explored one pillar of TOGAF (i.e., EAD) while TC46/SC11 used a different pillar (i.e. ADM)
- Finally this presentation is a demonstration of how records professionals are harnessing EA in their quest to fulfilling their professional mandate.

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