The Application of MBSE to Inform Workforce Decision Making

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FRAZER-NASH CONSULTANCY

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“Wholeing the Parts” – Why Apply Systems Thinking to Inform Workforce Decisions?

“… the performance of a system—and organizations are systems—is not equal to the sum of the performances of its parts taken separately, but is the product of their interactions.”

“It is better to do the right thing wrong than to do the wrong thing right.”

Russell L. Ackoff, 1994

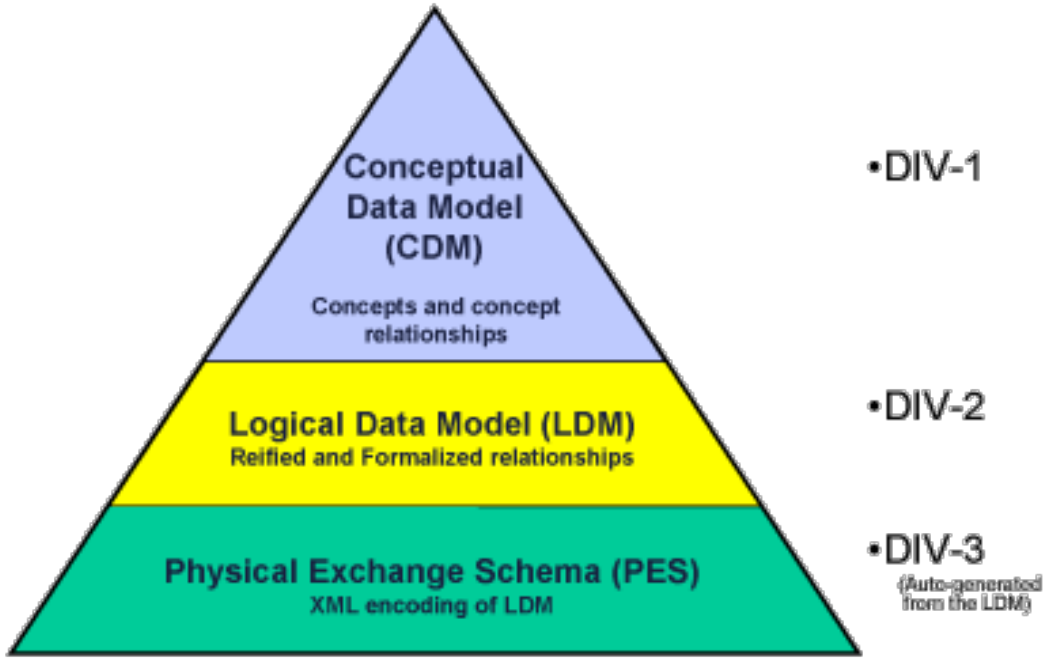
How Can MBSE Help To Address Current Workforce Challenges?

Current Practices/Challenges	MBSE Solution?
Stove-piped organisational change	Recognition of interdependencies between business areas
Problems are poorly understood, miscommunicated	Common vocabulary and constrained semantics
Document-centric reform - data storage in MS Excel	Model-centric approach
Process over outcomes	Do the right thing right (hopefully)

DoDAF Metamodel 2.02 (DM2) – Benefits

Why use DM2 for modeling workforce problems?

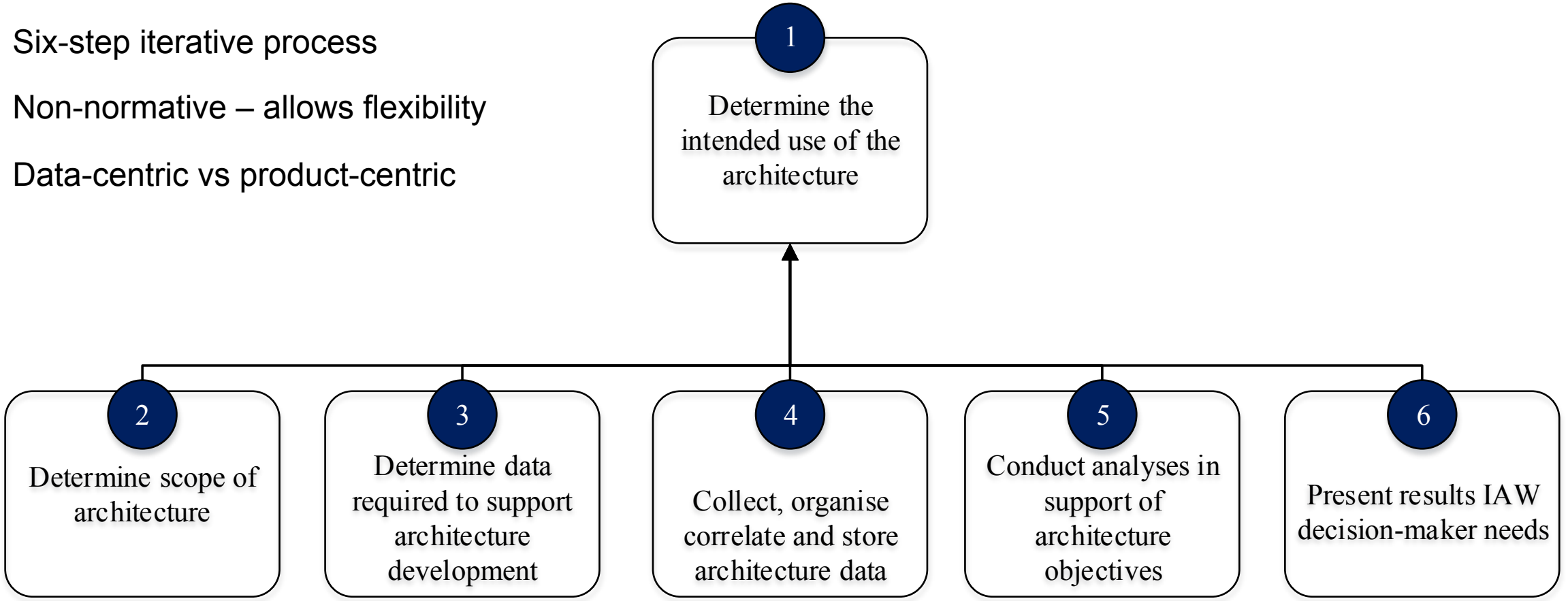
- Conceptual data model – suitable for a range of stakeholders
- Based on the IDEAS ontology – mathematical precision
- Allows the use of aliases – existing vocabulary
- Interoperability between MBSE tools



DM2 Three-Level Structure

DoDAF 2.02 Architecture Development Process – Benefits

- Six-step iterative process
- Non-normative – allows flexibility
- Data-centric vs product-centric

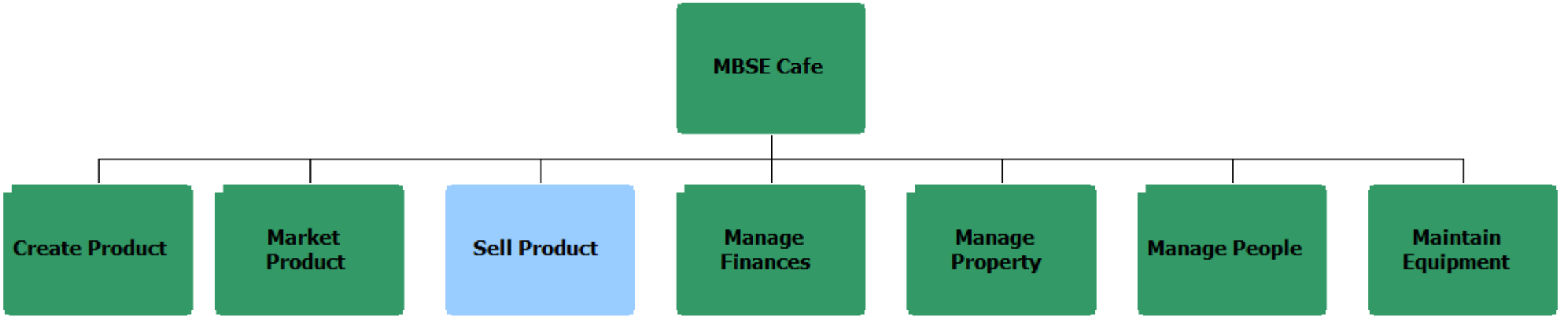


DoDAF 2.02 6-Step Architectural Development Process

Case Study – MBSE Café

- End-to-end example of architecture development
- Indicative of model-centric approach
- Café - relatively simple organization
- Benefits will scale with complexity

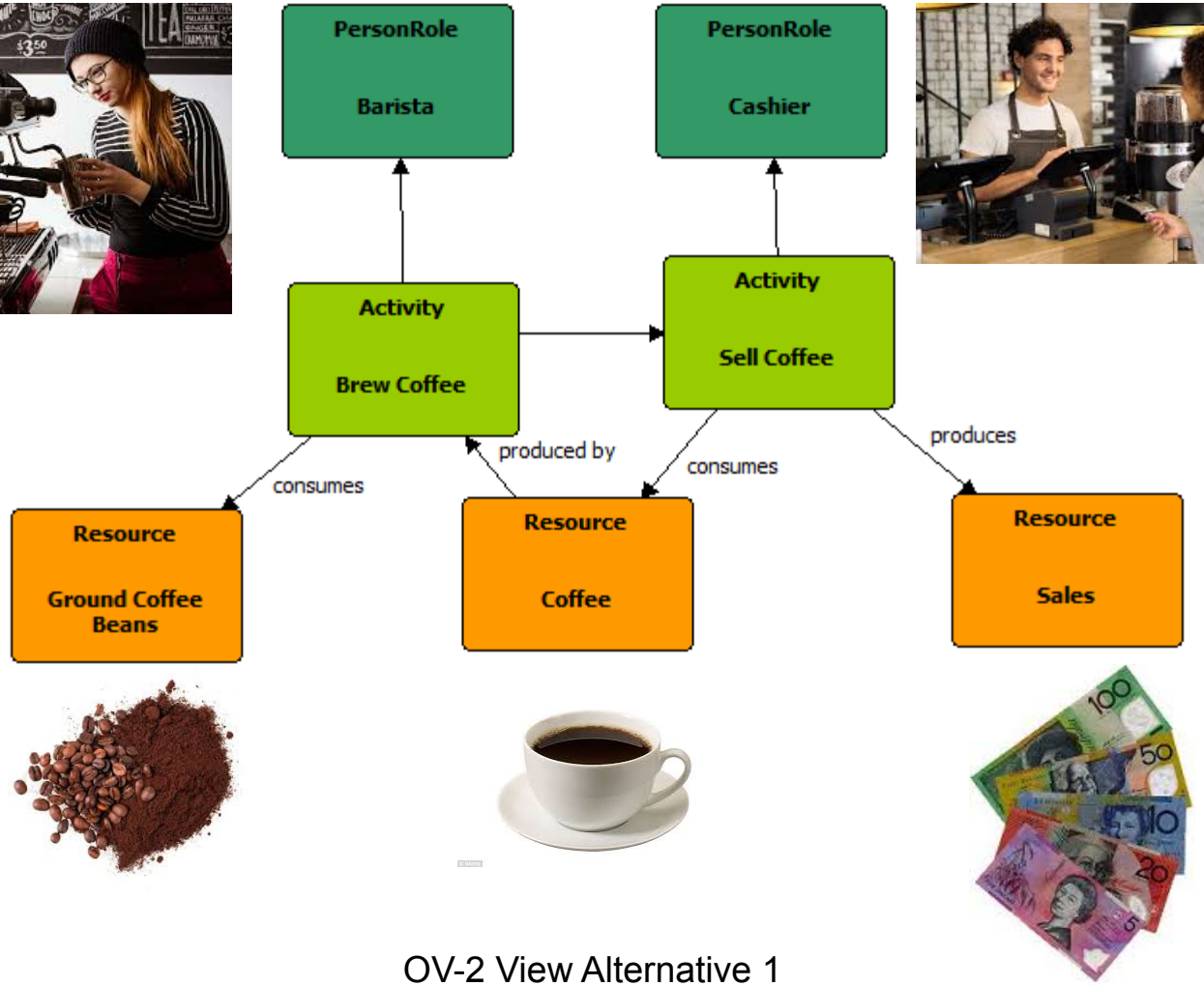
Case Study – MBSE Café – OV-5a view



- Informs understanding of entire enterprise activities
- Describe “value chain” in combination with other views
- People can see “their place” in the organisation

Case Study – MBSE Café – OV-2 view – Alternative 1

- OV-2 diagram can describe resource flows that impact workforce decisions
- Informs workforce decisions:
  - “What is the impact of losing a staff member?”
  - “How can processes be improved or automated?”



OV-2 View Alternative 1

Case Study – MBSE Café – OV-3 view

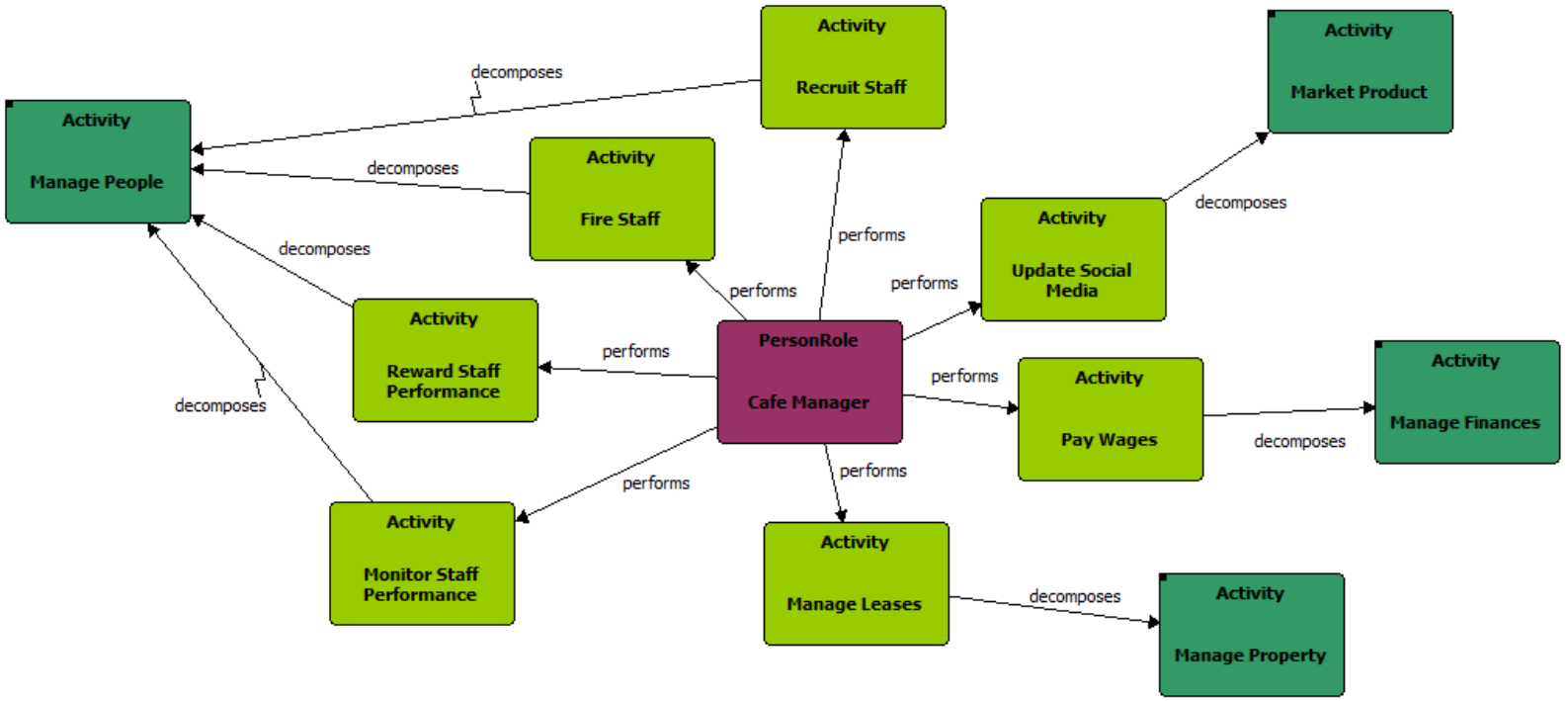
- OV-3 table describes resource flows in more detail
- Informs workforce decisions:
  - "What are training requirements for staff?"
  - "What activities can be outsourced or brought in-house?"
  - "Where are more or less staff needed?"

Resource		Produced/Consumed By				
Resource	MeasureOf Resource	Activity	PersonRole [performs]	MeasureOf Resource (PersonRole)	Resource (Consumed By)	Skills
Sales	2000.0 $ (AUD)/day	Sell Coffee	Cashier	0.8 FTE	Coffee	Numerical Proficiency
Coffee	500.0 Cups (30 oz)/day	Brew Coffee	Barista	2.0 FTE	Ground Coffee Beans	Coffee Making

OV-2 View Alternative 1

Case Study – MBSE Café – OV-2 View – Alternative 2

- OV-2 can also describe activities performed by a PersonRole
- Informs workforce decisions:
  - "What activities should a position include?"
  - "How do a position's activities link to the 'value chain'?"



OV-2 View Alternative 2

Large-scale Enterprise Implementation

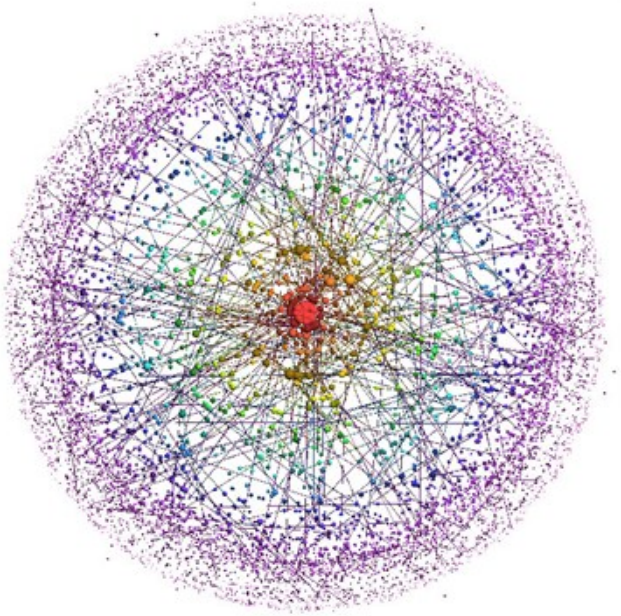
- Elements of this approach have been applied to a large organisation
- DoDAF steps 1-6 were implemented in phases
- Step 1 (user needs) identified key stakeholders and assumptions
- Steps 2 and 3 expedited through use of reference architecture for wider enterprise
- Step 4 used a combination of top-down and bottom-up approaches
- Step 5 developed resource flows using tailored OV-2 and OV-3, functional decomposition with OV-5a
- Step 6 presented views according to appropriate detail for each stakeholder

Implementation Challenges

- Various data formats encountered across departments, technical areas
  - Effort required to standardise and import data types
  - Business, social and political challenges
- Solution: communicate frequently and circulate data dictionary
- Different stakeholder backgrounds dictated presentation formats
  - Hesitant to adopt conventional MBSE diagram formats (e.g. SysML)
  - Existing vocabulary to describe data types
- Solution: tailor architecture views and use aliases

Implementation Benefits

- Parallel those found in typical MBSE applications – manage and present complexity
- OV-5a with 1000+ activities – organisational leaders and senior management discuss interdependencies
- OV-2/OV-3 – improved two-way communication with stakeholders, “location” in the model
- Automation of data input and view export
- Improved visualisation of linkages relative to MS Office suite
- Preliminary prioritization of workforce activities
- Understanding roles and job families
- Describing demand for work effort



Conclusions

- An MBSE approach can be applied to inform effective workforce decision-making
- Can assist organisational leaders and HR professionals to optimize their workforce
- DM2 is useful due to flexible architecture development process
- Other architecture frameworks could be applied (e.g. TOGAF)
- Different challenges cf. conventional applications - MBSE approach and presentation must be tailored
  - Non-engineering backgrounds
  - Different data types
- Some expected benefits materialise – notably complexity management, presenting linkages

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Thank you. Any questions?

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