Laws and Regulations: How Much Is Too Much? – A More Scientific Approach To Evaluating Impacts

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Agenda

- Problem Statement
- Enterprise Architecture Techniques
  - Scaffolding and Layers
- Example: Coal Ash Regulations
  - Context
  - Two Layer Scaffolding
  - Analysis
- Summary

Problem Statement

- Laws and regulations are proposed to curb corporate excesses, ensure safety and privacy, and achieve other governmental goals

  BUT HOW MUCH REGULATION IS TOO MUCH?

- Most enterprises impacted by new/proposed laws and regulations immediately protest
  - New regulations force **CHANGE**
  - CHANGE impacts **CORPORATE CULTURE**– the underlying assumptions about the way things have “always” been done
  - CHANGE costs **MONEY**
- How can we effectively and logically assess the impact of new regulations on types of enterprises to determine if these regulations unnecessarily hamper the enterprise’s core business?

Proposed Techniques

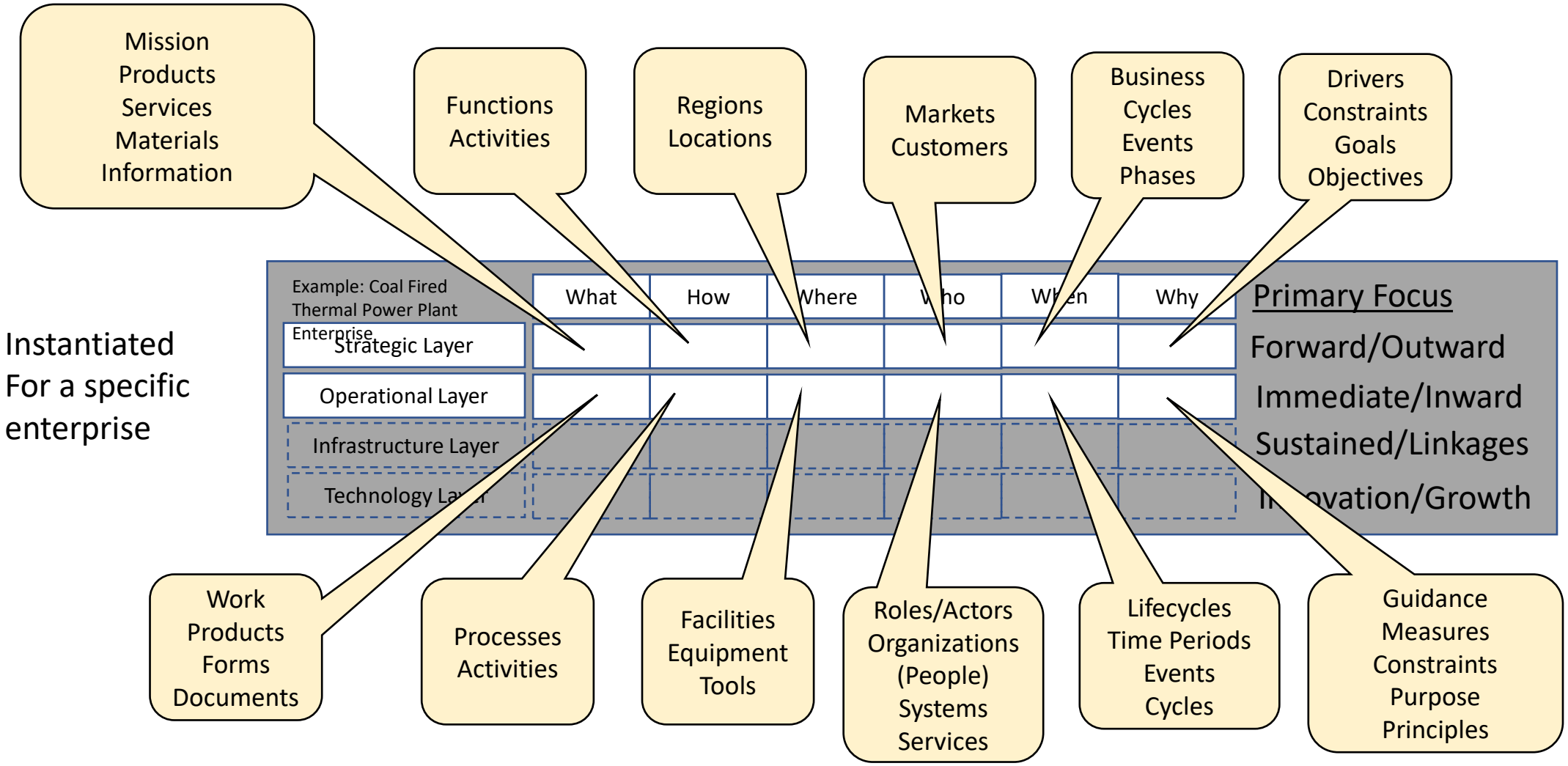
- Scaffolding
  - Closed Six-dimensional Analysis and Synthesis Framework
  - Systematic approach to data gathering
- Layers
  - Gathering data into a scaffolding for each needed aspect of the enterprise
  - Comparing data in each dimension across layers to see where impacts may fall
- Benefits
  - Problem Analysis/Synthesis – breaking down a complex problem into simpler sub-problems and synthesizing overall impacts, potential approaches, probabilities, and cost categorizations

(Techniques adapted from Enterprise Architecture)

Scaffolding and Layer Definitions

- Scaffolding Dimensions
  - WHAT: Elements of constrained products, services, materials, information
  - HOW: Elements of constrained activities
  - WHERE: Elements of constrained locations, equipment, tools
  - WHO: Elements of constrained roles and responsibilities
  - WHEN: Elements of constrained time periods, events and cycles
  - WHY: Elements of purpose, rationale, drivers
- Layers
  - Strategic: CEO and Board viewpoint
  - Operational: Plant Operator Viewpoint
  - Data & Information: CIO Viewpoint
  - Technology: CTO viewpoint
  - Infrastructure: CTO and Facility Manager Perspective

Scaffolding Illustration Sample



Example: Coal Ash Regulations – Need

- Coal Ash is dirty, toxic stuff dangerous to both people and the environment
  - Contains: Arsenic, lead, mercury, and other heavy metals
- Coal ash a by-product of coal fired electric power plants
  - These plants exist in almost every state across the lower 48, usually sited near water sources
  - Coal ash is mixed with water and stored in impoundment ponds close by the power plant
- Recently (2008 to present) there have been multiple incidents of rivers, lakes, and other sources of drinking water being contaminated by leakage from coal ash ponds

Coal Ash Regulations: Additional Context

- Focus on abstract Power Generation companies that operate coal fired power plants
- If these companies are owned in turn by holding companies that specialize in power related industries, this structure may limit the options of the power generation company to expand into other types of power generation
- The recent coal ash pollution incidents have resulted in federal regulations on coal ash storage (as well as multiple lawsuits)
  - Current administration looking at weakening these regulations

Coal Ash Regulation Example Methodology

- Will limit this example to two layers: Strategic and Operational
- Scaffolding is developed for each layer for an abstracted coal fired power plant Public Utility company prior to regulations with impacts of regulations identified
- After scaffolding is developed, analysis is provided:
  - Taking impacts in each dimension across both layers,
  - Identifying potential approaches for the company in addressing the impacts
  - Estimating probability and cost rating for each approach
- After analysis, the set of the company's logical options can be identified and the overall impact of regulations on the company's core business evaluated

STRATEGIC LAYER	POTENTIAL IMPACTS	PROBABILITY/COST ANALYSIS
WHAT: Electrical Power, Cost, Profit, Policy	Changes in Cost, Profit, and Policy	Probability of Changes: High; Probability of Resistance: High Moderate to High Cost Increase Overall; Short Term Decrease in Profit; Moderate Cost of Policy Change
HOW: Generate & Distribute Power; Manage Costs; Maximize Profit	Additional high-level business functions	Probability of New Business Functions: Moderate Moderate Cost
WHERE: Plant Installations; Headquarters & Business Offices	Acquisition of additional land; modifications to existing installations	Probability of New Land Acquisition: Moderate; Probability of Modifications: High Moderate to High Costs
WHO: Upper Management & Executives; Planners; Business Units/Divisions	New Business Units; new management responsibilities; new management skills/expertise	Probability: High Low to Moderate Costs
WHEN: Business Lifecycle, Production Lifecycle, External Events	Changes in business & production lifecycles; additional cycles & events	Probability: High Costs included in establishing new business functions
WHY: Profits; Public Utility Services; Safety; Compliance	New regulation compliance	Probability: High Costs include costs of overall changes

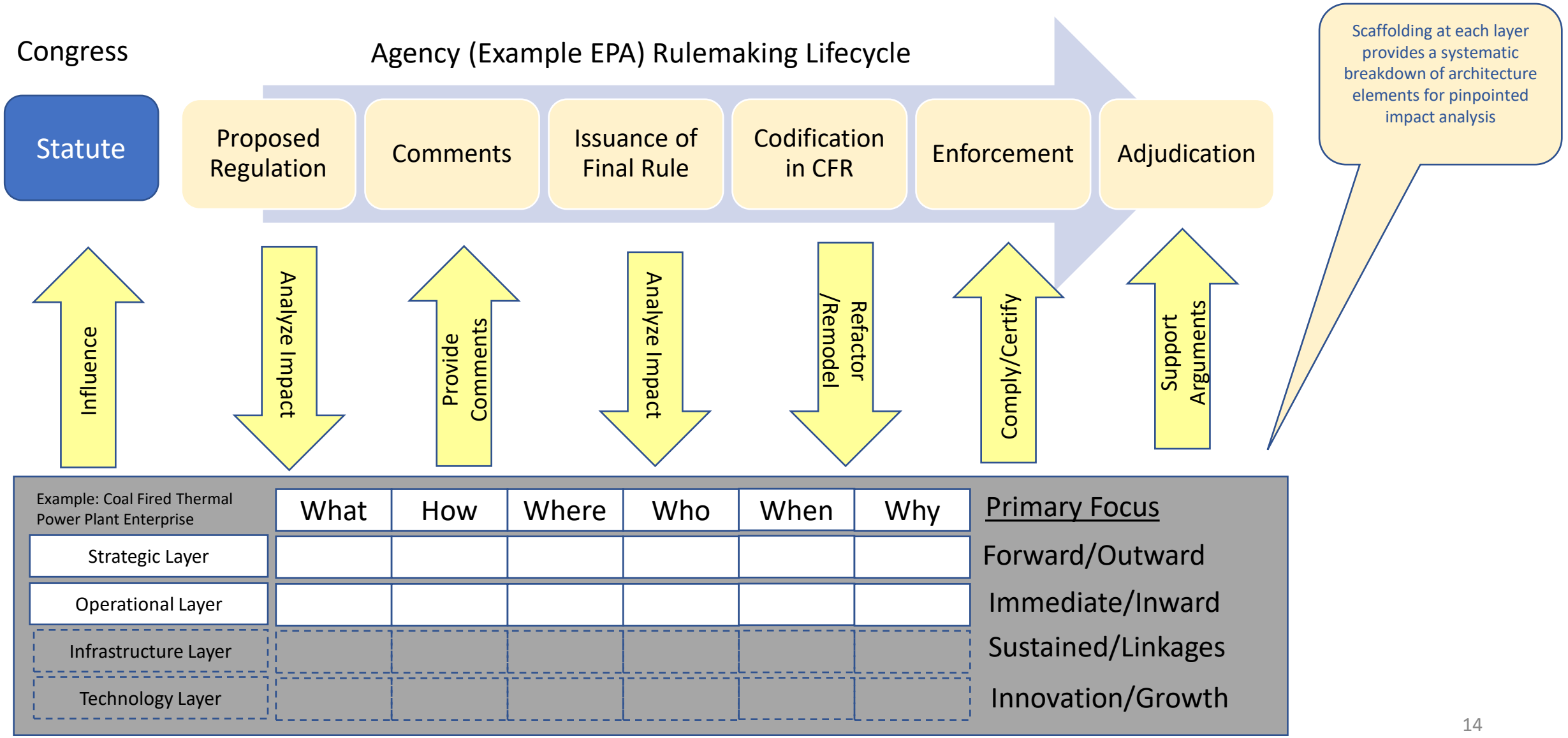
OPERATIONAL LAYER	POTENTIAL IMPACTS	PROBABILITY/COST ANALYSIS
WHAT: Electrical Power, Coal, Water, By-products	Restrictions on type of coal used; reduction in power output	Probability: Low High Costs
HOW: Operate & Maintain Coal-fired Power Plant; Manage Coal Supply/Storage; Manage By-product Storage; Maintain Grid Connections	Move & line/seal ash ponds/pits; additional water pollution monitoring; transport of coal ash; recycling of coal ash	Probability: High High Costs; but potential new revenue stream
WHERE: Power Plant Installation	New locations for coal ash ponds/pits; transport roads; new monitoring sites	Probability: High High one-time costs
WHO: Plant Managers; Operations/Maintenance Engineers & Crews	New/additional crews, engineers, and managers for coal ash transport and pond/pit sealing, maintenance, and monitoring	Probability: High Moderate to High Costs
WHEN: Operations & Maintenance Schedules; External Events	New schedules for coal ash pond/pit development, maintenance, & monitoring; additional emergency responses	Probability: High Costs included in establishing new business functions
WHY: Public Utility Requirements; Profit; Grid Cooperation Agreements; Safety; Compliance	New safety concerns; new compliance concerns	Probability: High Costs include total costs of compliance plus additional safety costs for new business processes

Summary

- Laws and regulations can impact an enterprise in multiple ways:
  - Requiring roles; requiring or constraining activities; constraining or requiring response/cycle times or other aspects of timeliness
- Enterprises tend to resist change and respond to proposed new laws and regulations with protest
- The impact of a law or regulation on an enterprise can be analyzed using a 6-dimensional scaffolding applied in layers that can then be “stacked” to see more overall impacts
  - Reasonable alternatives approaches to the impacts can be investigated
- This analysis can provide a cross check on how legitimate the protest against the new law is
- Once done, the analysis can be used to check the change in impacts caused by roll-back of parts of the regulations.

Backup Slides

Analysis of Impact Approach



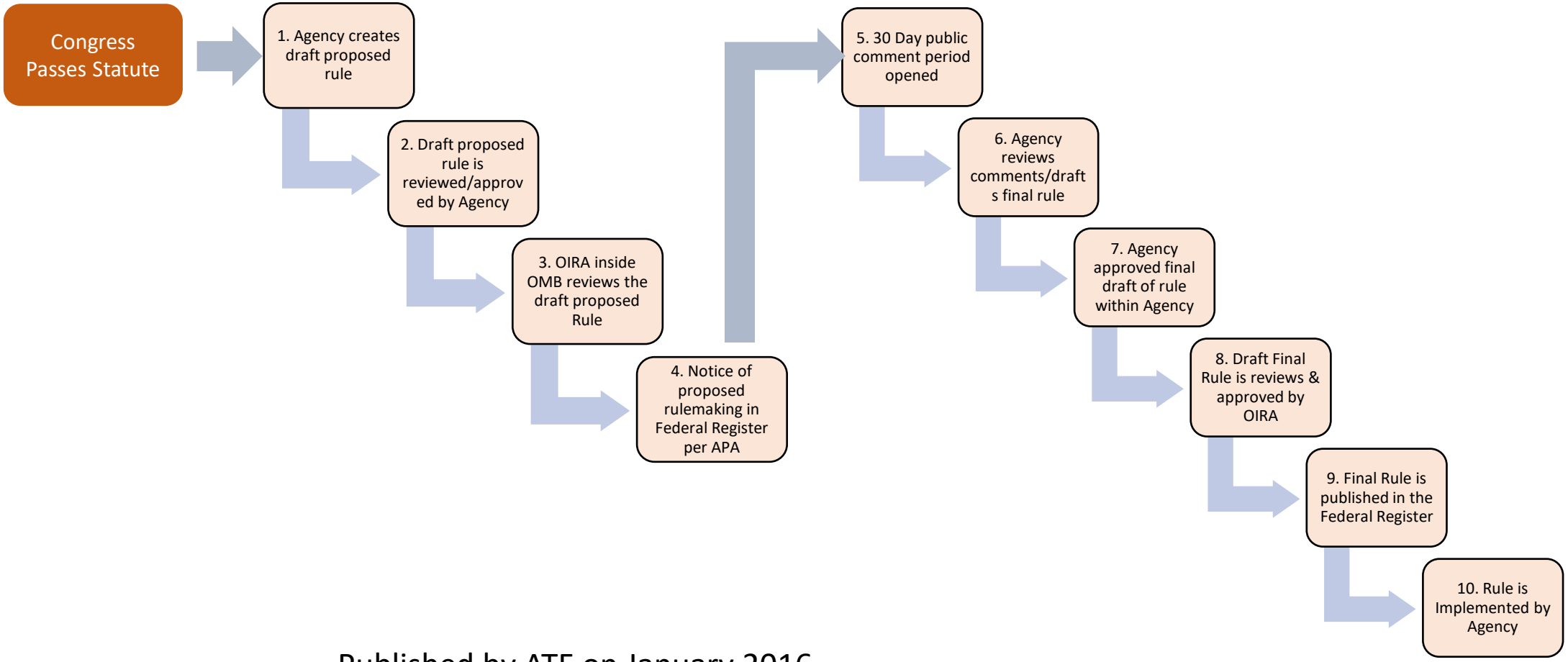
Future Research

- Codifying scaffolding for specific domains
- Systematically deconstructing the elements of laws and regulations into the variables of architecture:
  - Information/Resource
  - Function/Activity (From the clauses)
  - Location
  - Role
  - Time
  - Motivation
- Representing Guidance narratives through a 1 layer scaffold just as we represent the enterprise with multiple layers and dimensions

Summary

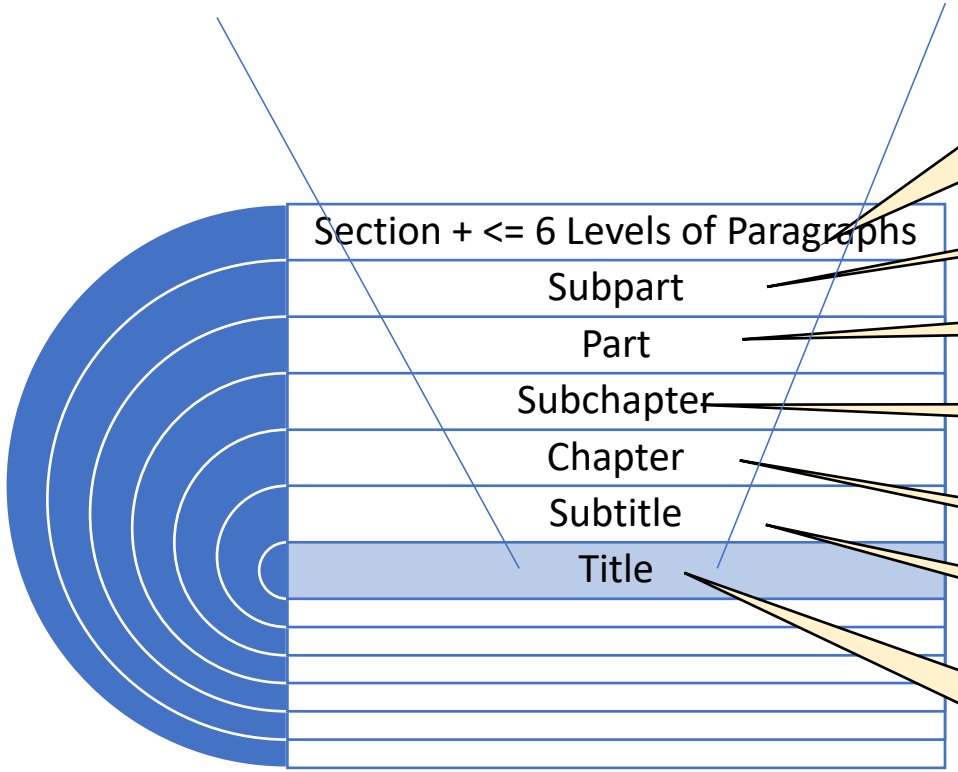
- Scaffolding techniques to represent enterprise architecture provide the following benefits
  - As-observed separation of concerns through the layers (No architecting distortion)
  - Separation of architecture variables through dimensions (Mutually exclusive variables)
  - Provision of a template for enterprise representation for each layer (Reduce architecting to a simpler exercise of instantiation)
- Laws and regulations are complex statements of constraints that involve/touch all enterprise variables and concerns (Layers and Dimensions)
- By separating variables and concerns, pinpointed analysis of impact can be easily performed by groups of stakeholders independently.
- The totality of impacts can be brought together to provide comments, feedback and redirection in rulemaking phases.

Federal Rulemaking Process



Published by ATF on January 2016

Structure of Code of Federal Regulations



SECTION Is the basic unit of the CFR (ie. 40 CFR 262.34). It typically contains one provision of program/function rules. A section may contain up to six levels of paragraphs

SUBPART is a further refinement of the part, if necessary.

PART Contains rules on a single program or function.

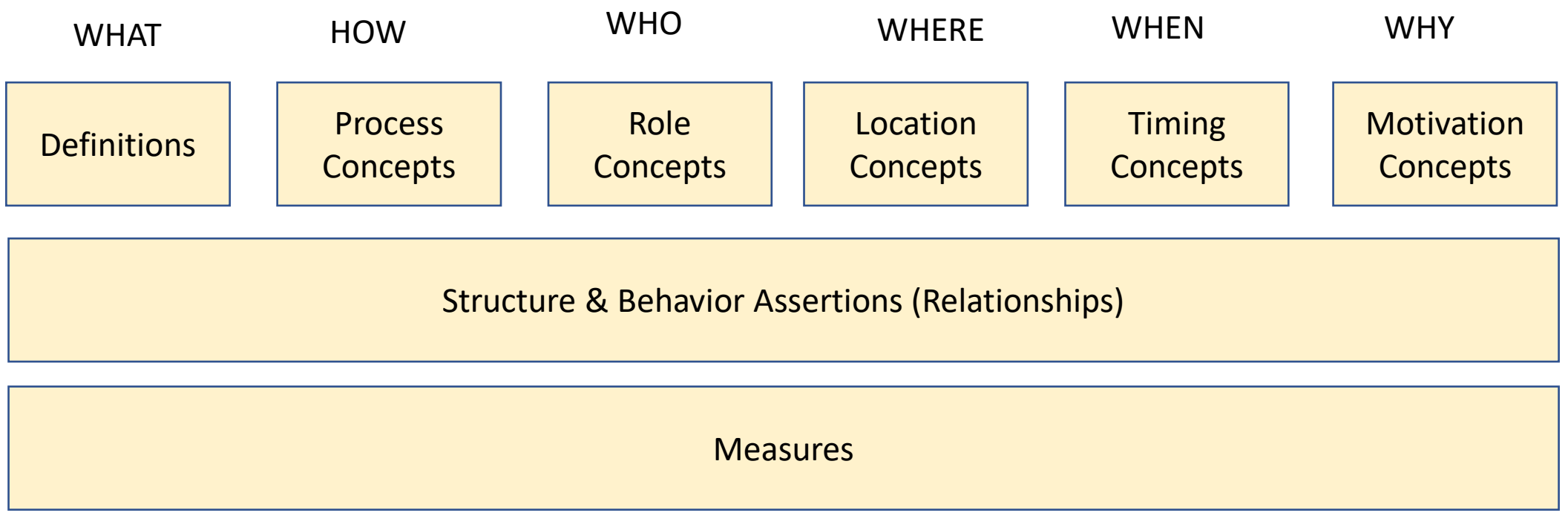
SUBCHAPTER a further refinement of the chapter, if necessary.

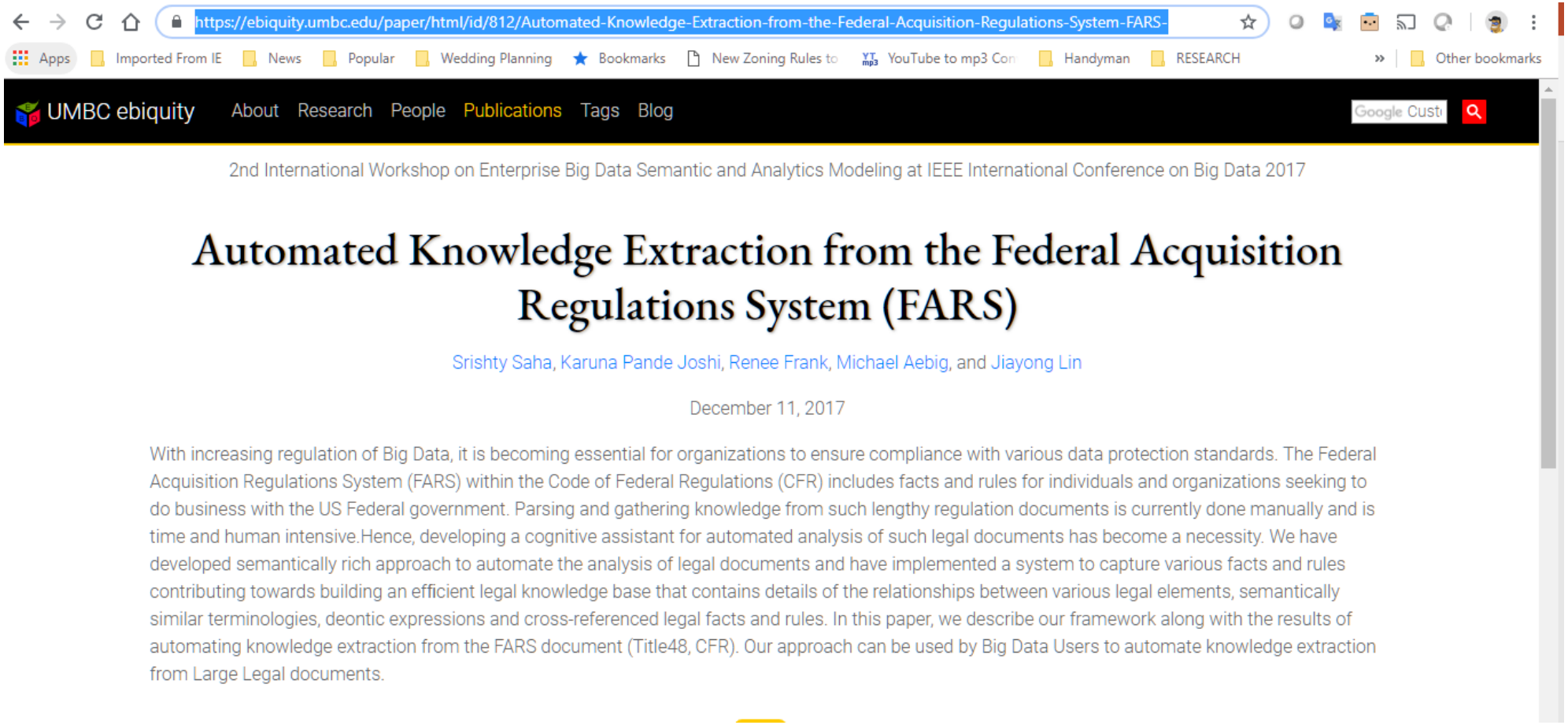
CHAPTER Contains the rules of the issuing agency and usually bears its name (i.e. the Pipeline and Hazardous Materials Safety Administration, Department of Transportation

SUBTITLE separates the administrative rules of the agency itself (usually in Subtitle A) from the regulations it is responsible for (usually in Subtitle B)

TITLE represents a broad subject area of regulations. Title 40 of the CFR – or 40 CFR – contains all of the regulations of the US EPA

Rule Contents (Preliminary)



Understanding Rules through Rule Concept Mining

Automated extraction of FARS Knowledge