Industry Knowledge Graph LLC

Strategic Planning
In The Data-Centric Era

Home of the
Industry Knowledge Graph
solution for Business Execs™

Industry Knowledge Graph LLC
Educational Service for:

➢ **Data-Centric Strategic Planning™ Clients**

➢ **IndustryKG™ Ecosystem Channel Partners**

July 15, 2022

Strategic Planning in the Data-Centric Era

1 Intro to DCSP for Business Executives

2 Ontology for Business Executives

3 Strategic Planning in the Data-Centric Era

Focus of this presentation

4 DCSP Implementation Guidebook

START WITH A **Data-Centric Overview for Business Executives**

DCSP Resources & Extras **5**

6 DCSP Technical Overview for Business

7 DCSP TTL for Strategic Planning

8 DCSP Vocabulary for Strategy
+IT+DCA+W3C+gist+ibbeo

The Data-Centric Strategic Planning (DCSP) Series

IndustryKG™

Strategic Planning in the Data-Centric Era
Using **DCSP** for (Use Case #1) **Market Intelligence**

THE DATA-CENTRIC REVOLUTION — Restoring Sanity to Enterprise Information Systems

DAVE MCCOMB

1

Data-Centric Thinking

semantic arts

2a **2b**

gist (Upper Ontology Best Practices)

SA-DCA

Industry Best Practices for Strategy & Data

3

'How-To' templates based on Porter's ideas

COMPETITIVE ADVANTAGE — CREATING AND SUSTAINING SUPERIOR PERFORMANCE — with a new introduction — Michael E. Porter

HBS — **Prof M. Porter**

Strategic Frameworks

STRUCTURED STRATEGIC PLANNING — Corporate, Business Unit and Cost Center Strategies — Alan S. Michaels

Alan S. Michaels

4 — **Five Forces Industry Data**

5 — **IBB Ontology**

	Bus 1	Bus 2	Bus 3	Bus N	Data ...	More Data
Industry Name						
Industry 1 Data →						
Industry 2 Data →						
Industry 3 Data →						
Industry 4 Data →						
Industry 5 Data →						
Industry 23000 Data →						

The Economy **IBB** — Research Focus: Companies with a Global Market Share of 1% or more in any Industry

Data-Centric Strategic Planning™ (DCSP) **Platform**
built by Semantic Arts

Note: Belief in Porter's five-forces industry framework is highly recommended but not required. We support multiple industry classification systems.
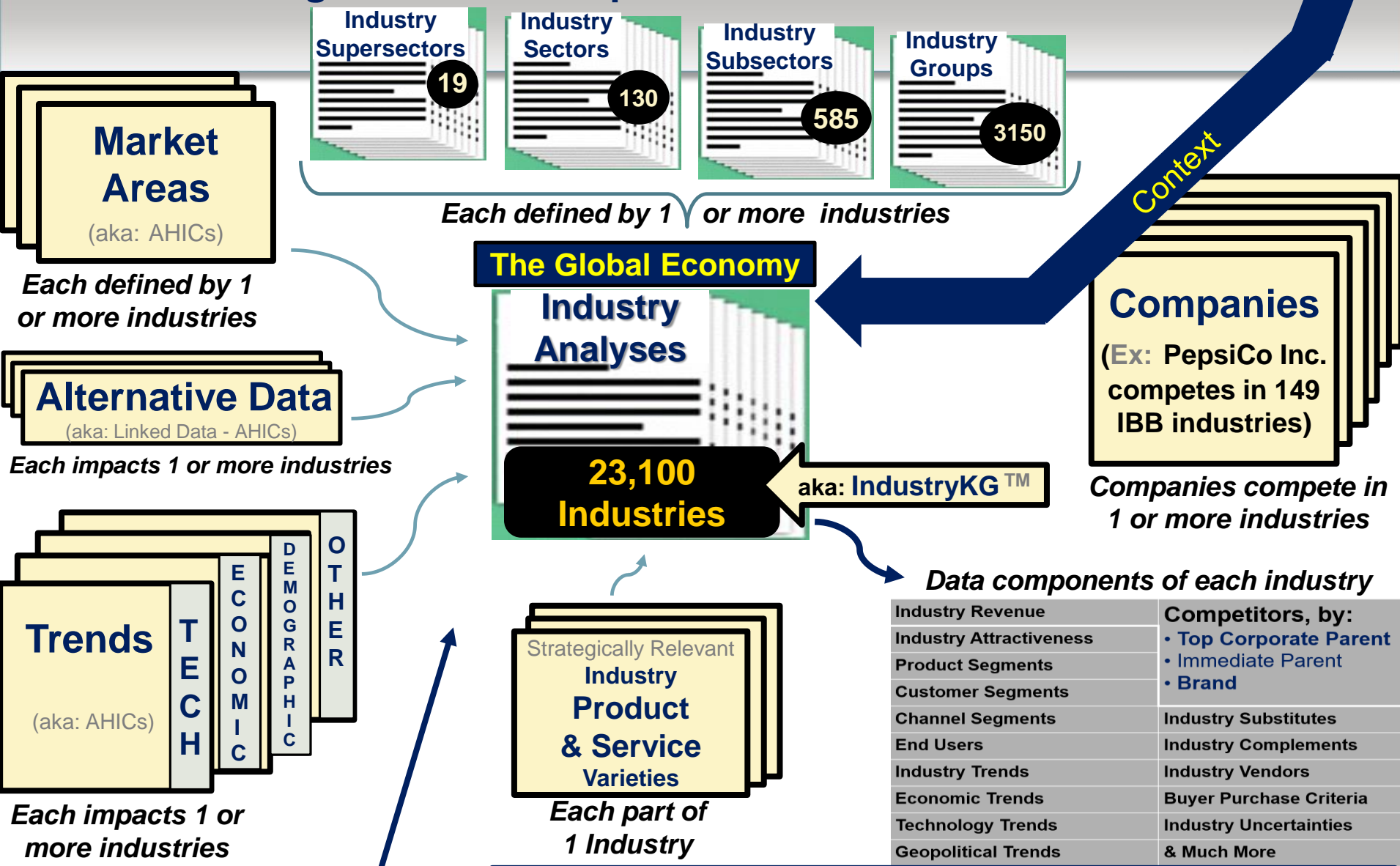
IndustryKG™

Also provides a logical framework for building a use-case implementation road map

For on premises, or the cloud of your choice.

This Presentation is Designed for The CEO, The Chief Strategy Officer & Everyone Else

Agenda for: Strategic Planning in the Data-Centric Era

1) **Context + Point A: the data centric movement impacts many industries + activities beyond strategic planning. Point A**

   Your current position

2) **Best practices for holistic** (corporate) **strategic planning** (with or without a data-centric architecture)

3) **Expected changes in the corporate planning process when data is a 1st class citizen** (not beholden to any application).

   This **planning delta** is a small subset to the **enterprise delta** for moving to a data centric organization. (For details on the much larger organizational delta, see the module: Data-Centric Overview for Business Executives.)

4) **The business input needed by ontologists** (to speed develop of your company's enterprise knowledge graph)

   When defining a business (its vision, objectives, target customers, products, vendors, etc.) it's logical to also include the extra information that ontologists need.

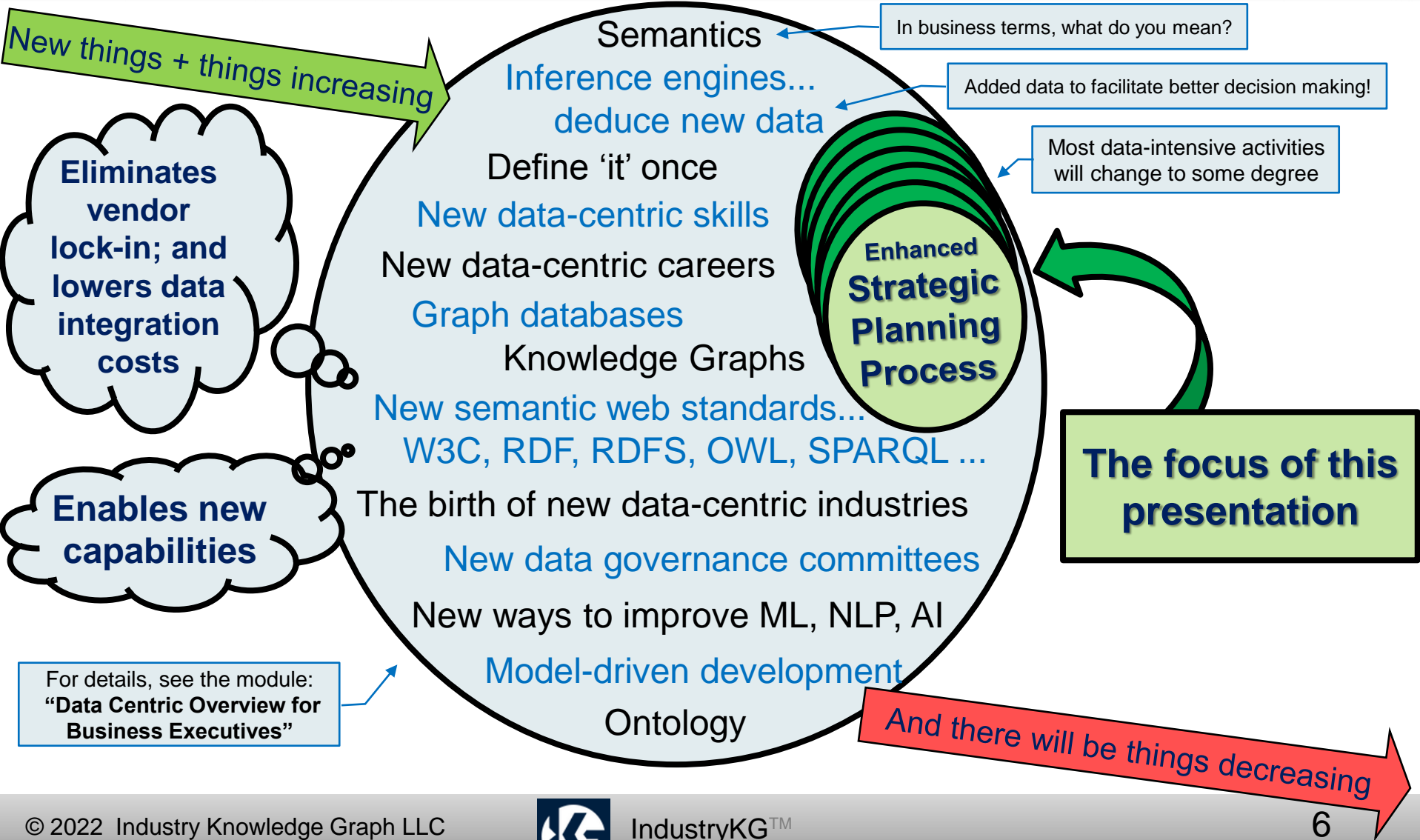5) **DCSP functionality you may, or may not, have had before**

"The industry is the fundamental arena in which competition occurs."
- M. Porter. Organizations compete in one or more industries within

Industry Supersectors — 19
Industry Sectors — 130
Industry Subsectors — 585
Industry Groups — 3150

Context

Each defined by 1 or more industries

Market Areas
(aka: AHICs)

Each defined by 1 or more industries

Alternative Data
(aka: Linked Data - AHICs)

Each impacts 1 or more industries

Trends
T E C H
E C O N O M I C
D E M O G R A P H I C
O T H E R
(aka: AHICs)

Each impacts 1 or more industries

The Global Economy

Industry Analyses

23,100 Industries

aka: **IndustryKG** ™

Companies
(**Ex:** PepsiCo Inc. competes in 149 IBB industries)

Companies compete in 1 or more industries

Strategically Relevant
Industry Product & Service
Varieties

Each part of 1 Industry

Data components of each industry

	Competitors, by:
Industry Revenue	• Top Corporate Parent
Industry Attractiveness	• Immediate Parent
Product Segments	• Brand
Customer Segments	
Channel Segments	Industry Substitutes
End Users	Industry Complements
Industry Trends	Industry Vendors
Economic Trends	Buyer Purchase Criteria
Technology Trends	Industry Uncertainties
Geopolitical Trends	& Much More

A single, simple, extensible, federate-able model of the global economy in terms of 23,100 granular industries

The Data Centric Movement Is Impacting Many, Many Areas (with Strategic Planning Just One Area)

New things + things increasing

Eliminates vendor lock-in; and lowers data integration costs

Enables new capabilities

Semantics

In business terms, what do you mean?

Inference engines... deduce new data

Added data to facilitate better decision making!

Define 'it' once

Most data-intensive activities will change to some degree

New data-centric skills

New data-centric careers

Graph databases

Enhanced **Strategic Planning Process**

Knowledge Graphs

New semantic web standards... W3C, RDF, RDFS, OWL, SPARQL ...

The focus of this presentation

The birth of new data-centric industries

New data governance committees

New ways to improve ML, NLP, AI

For details, see the module: **"Data Centric Overview for Business Executives"**

Model-driven development

Ontology

And there will be things decreasing

Before Discussing the Enhanced 'Data Centric' Strategic Planning Process: Take Stock & Be Cognizant

Take Stock

1. **Implicitly, or explicitly, your company** (and each line of business) **has a strategy today** (even if not documented, communicated or understood by your employees or other stakeholders)

Be Cognizant

2. **The data-centric movement provides new sources for competitive advantage which, in turn, will lead to changes in strategy for some businesses** (and changes in some value chain activities for many)

3. **The data-centric movement may come as a culture shock for many IT professionals, as well as to some companies in how they operate**

Where are you today?

- Within the context of your company's overall vision and corporate strategy (which should include an understanding of the company's purposeful coordination between lines of business)

  - **each business unit should understand its strategy of differentiation or cost leadership**, as well as the industry segments it is targeting

The typical activity sharing "costs" (of coordination, compromise and inflexibility) are greatly reduced because of W3C standards.

A logical view of any company (where not all shared activities are shared by all business units)
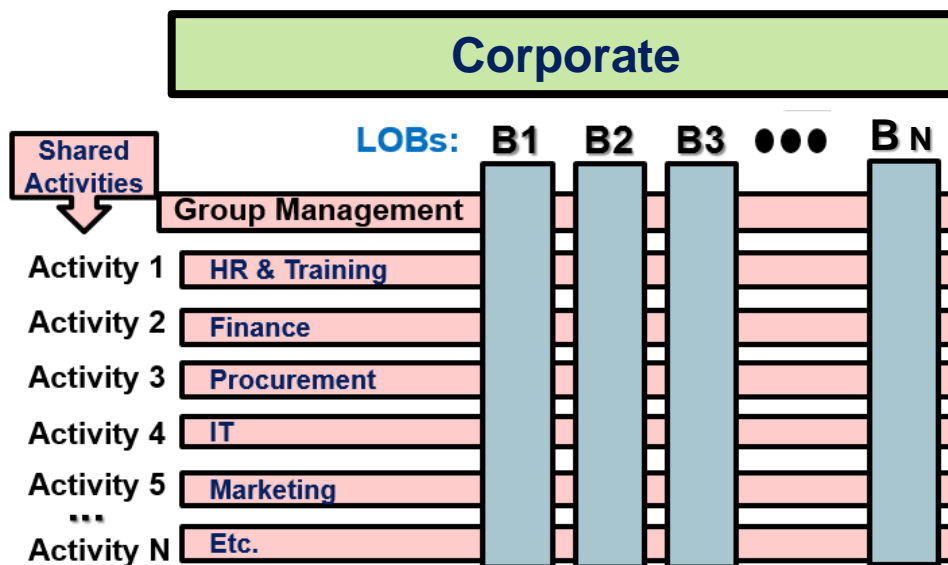
Be Cognizant:
New Sources for Competitive Advantage

The impact of the data-centric movement:

- Since 2012, with Google's advances in knowledge graphs, IT data sharing costs and the ability to differentiate based on the semantic web have changed the competitive playing field in many areas. Specifically, the trifecta of:
    - Semantics, knowledge graph databases, and model driven development have changed the rules for competitive advantage for many companies in data intensive industries (which includes most industries).
        - The cost dynamics for performing many activities and developing most IT systems have changed.
        - Data vendors not able to deliver triples on demand will soon be lucky if they can stay in business.
        - Open standards (mostly from W3C) continue to lower IT vendor switching costs.

> **A technology trend impacting most industries, most companies, and most data intensive activities.**

Be Cognizant:
New Sources for Culture Shock

Two potential culture shocks that may need to be addressed in your planning, include:

1) **Shock to your IT staff** – this is whole new world. Experts in the application-centric arena may not be willing or able to make the necessary changes as needed.

2) **Shock to the Businesses** –

   ❑ **IF** a company has a culture where as long as an individual business unit makes their target they can do what they want,

   ❑ **THEN** the opportunity cost in allowing business units to move ahead with one-off projects (systems) has increased dramatically (because the new data-centric approach represents a far superior enterprise alternative). For the many companies where line-of-business managers don't trust a centralized approach to IT development, new thinking is required. It should be noted that most data-centric development doesn't need to be centralized - a few good governance committees can handle the needed coordination.

Best Practices for Corporate Planning
Key Concepts & Definition

✓ The logical reason to do all this corporate strategy / planning stuff is to improve the odds that Your Company (with a framework to think strategically and with better data across the enterprise) will improve its decision making, resulting in above average returns in the future.

✓ Strategic planning is the key activity that will define a firm's competitive strategy that will direct its route to competitive advantage that will determine its performance. - Michael Porter

✓ Holistic Corporate Planning (for companies that compete in more than one industry) includes three very different types of planning, each with very different processes. (Most 'strategic' planning software assumes the company competes in only one industry; and it should be used only by companies that fit that characterization.)
The three types of planning include:
1) **Corporate Strategic Planning**
2) **Business Unit Strategic Planning**
   ❑ **Industry Analysis**
   ❑ **Competitive Strategy**
3) **Shared Activity** (cross-BU) **Planning**

> For those companies that also plan at intermediary levels, the structure of those (Divisional or Group) strategy documents is basically the same as the corporate strategy document (less of a few sections) with a portfolio approach to maximize the results of the business units in the group.

> **Industry Knowledge Graph LLC** (which provides the DCSP platform) **is the exclusive provider of IBB's strategically relevant data for 23,000 industries.**

✓ "The industry is the fundamental arena in which competition occurs. The five competitive forces that determine industry profitability are: industry competitors, potential entrants, buyers, substitutes and suppliers" – Michael Porter

Best Practices for Corporate Planning
Key Concepts & Definition   *(Continued)*

(Corporate) Strategic Planning for Most Large Organizations = a set of activities engineered to develop an explicit, coordinated set of business unit **(BU)** competitive strategies **(where the BUs have actual or potential tangible interrelations between them across their respective value chains, including the sharing of data)** designed **(intended)** to lead to a competitive advantage for the organization.

For each Line of Business →

Competitive Strategic Planning for a Business Unit = a BU's intended actions **(activities to perform)** and planned route to competitive advantage **(in offering one or more products and/or services that target one/or more buyer types)** that will determine its performance.

Best Practices for Corporate Planning

TIP: Ignore your org charts when identifying the industries you compete in.

- Holistic Corporate Planning should include corporate strategy, business unit strategies, and shared activity (cross business unit) planning

KEY Step: Identify the granular **industries you compete in** (at the five forces level - and optionally use IBB's initial list)

THE STRATEGIC PLANNING & IMPLEMENTATION ROAD MAP

Start

STILL RELEVANT **Best Practices** (all on one page!)

- Alan S. Michaels

Clarify Corporate Vision and Corporate Objectives

Identify Business Units (add / delete if necessary)

Develop Business Unit Competitive Strategies

Develop Horizontal Strategies (for shared activities)

Refine SBU Strategies to Optimize Company Goals

Develop Internal & External Communication Strategies

Ensure Congruence with Human Resource Strategies

Ensure Congruence with Information Technology Plans

Implement Strategies as a Coordinated Event

Monitor Internal Results & Monitor External Events

Best Practices for Corporate Strategy
Include Sharing Among Business Units ←
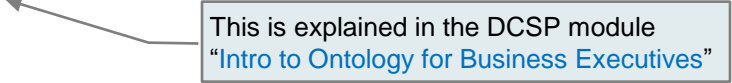
➢ **The key reason that multi-business companies exist** (rather than exist as distinct, single-business companies) **is to make the whole greater than the sum of its parts.**

• Opportunities for business units to share typically arise due to common buyers, common vendors, common technologies, common anything.

• If multiple business units share common customers, for example, it may (or may not) make sense to share a common sales force. (The same is true for customer service, human resources, legal, development, etc.) Companies should systematically evaluate the pros and cons for sharing each value activity of each business unit with the other business units. (Shared activities do not need to be shared across all business units.)

• Any activity has the potential to be shared – and the reason for sharing is most often some type of economies of scale or shared cumulative learning that leads to a competitive advantage.

• Besides tangible interrelationships between business units in the performance of shared activities, skills transference and the transference of know-how (aka: intangible interrelationships) is another key source of competitive advantage.

• **The Data-Centric movement represents huge opportunities for sharing data, terms and ontologies,** as well as the sharing of know-how in a) **semantics and ontology training** and b) **data-centric and enterprise knowledge graph development.**

Shared websites, portals, wikis, and forums for learning and reuse

The Data-Centric Impact On Corporate Planning

- For consistency and some pizzazz, the "planning documents" might well be accessed as graphs, with the option to produce traditional documents.

- A few new sections need to be added to each of the three major types of planning documents (for corporate strategy, business unit strategy, and shared activity planning) as well a big chunk of modeling that needs to done at the outset (unless licensed or imported).

  This is explained in the DCSP module "Intro to Ontology for Business Executives"

- Specifically, the company needs to characterize its customers, channels, vendors, competitors, products and services, etc. In addition to some new semantic activities being added, some IT-related activities will change, while other IT-activities will eventually disappear.
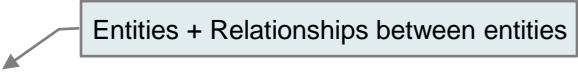
- New activities include defining the data (by defining Specific Things, Kind of Things, and the Relationship Between Things. Do it once, and do it well)
  - ❑ Gist represents a (best-in-class) upper ontology that can be used as the core of your company's core ontology. Many companies will eventually need to add more focused (specialized) classes and properties (data relationships) to account for the nuances of their specific company and the industries in which they compete. (E.g., some lines of business will need their own sub-ontology extensions for one reason or another. TIP: a dozen new classes max.)

- Business and data requirements have typically been developed application by application. It's time to forget all that. The Business and the Data still need to be defined – just not for a specific application.

- Each line of business (LOB) can now more easily own its data and determine who can access it. ← aka: federated development.

- Your Company's Enterprise Knowledge Graph will increasingly become a one-stop shop to view / query what the company knows (around a central model that should respect, and be aligned with the lines of business).

The Data-Centric Impact On Corporate Planning

(Continued)

- A greater focus will now exist to develop a Controlled Vocabulary for the enterprise. (This could be done without Data-Centric thinking, but it's just not typically done.)

  Entities + Relationships between entities

- Business units will discover reusable concepts that will lead to reusable ontology and increased data sharing across business units which, in turn, will lead to better corporate and cross-business unit reporting

- Given that every new solution that leverages the company's core enterprise shared model adds to the breadth of the enterprise knowledge graph, a new corporate KPI will evolve (measuring % of corporate data accessible).

- Industry associations developing ontologies have the potential to raise the bar, especially for companies with little to know skills in ontology. (Unfortunately, the perceived need to compromise and accept suggestions from industry members has frequently led to bloated ontologies with unnecessary and costly overhead from the addition of unneeded classes and properties.)

- The once fashionable idea of using a credit card to license a one-off solution with its own data schema will increasingly be viewed as detrimental to the company's ability to fully know what it should know.

  – Because economies of scale for shared data increase in a data-centric organization, the develop (do) anything you want in your own sand box as long as you meet ROI targets becomes relatively less attractive. (At a minimum, companies should revisit the opportunity costs for enabling data silo development.)

- With a much closer examination of which Kinds of Things (Classes) and Relationships Between Things (Properties) are common across two or more Lines of Business:

  ➢ Each common occurrence highly suggests that the meaning (semantics) should be defined only once (really well) and shared (reused) to reap cost benefits through significantly lower maintenance costs (as well as hard to measure but real performance benefits realized by companies with a manageable number of concepts that humans can deal with)

(Continued)

New Data-Centric Related Activities That The Business Should Know About

- Consistent URI Mining
- Ontology and semantics sharing
- DCA Governance should probably match corporate/division/SBU structure, plus account for:
  - TBox Governance
  - ABox Governance
  - CBox Governance – a collaborative shared learning experience
- Enterprise ontology vs. graph based architecture vs. model-driven architecture
- Constraint + identity management layers of the DCA
- Taxonomy Software - SmartLogic; Collibra; TopQuadrant's EVN; PoolParty
- Ontology Training
- Business users, who traditionally would not get involved in reviewing schemas, etc. should get involved with reviewing ontologies.
  - The OWL language is used to model ontologies – and some tools (like Turtle) allow the user to review one concept (class or property) at a time via a simple graphic of nodes and arrows. Business users should request that each concept includes a definition (skos:definition) and an example (skos:example) for a minimum level of common understanding

The Data-Centric Impact On Corporate Planning

(Continued)

New Data-Centric Related Activities

- Inventory of Data Stores (triple stores, repositories)
- Constraint & identity management layers of the DCA
- What's new and significant in the data-centric world is that Things only need one globally unique identifier. (aka: the elimination of different applications with redundant definitions, representations, profiles of, etc.) So a new activity is checking to see if the same referent (Thing; Subject) is being referred to using different IDs in different systems – and how to resolve that in the ABox. For Things outside of the company's control, it's fine to use the gist "sameAs"
- More of a need to clarify which Business Units have access to data
- Specify if any taxonomies represent a strategic advantage
- Re-evaluate IT vendors – especially where lock-in is present

The Data-Centric Impact On Corporate Planning
(Continued)

Linked Data

Linked Open Data (LOD) That's Publically Available – Viewing data integration costs (triples) in a new light
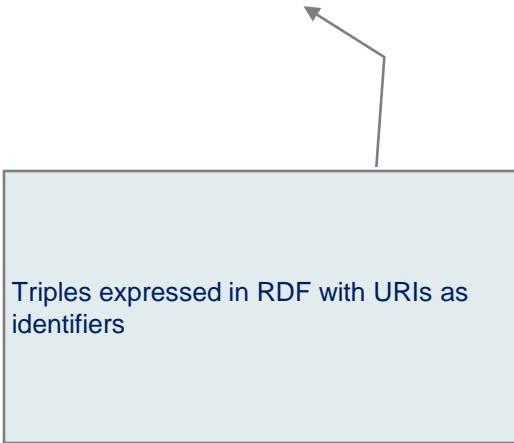
Linked Open Data - Free

- DBpedia data
- GeoNames
- [Some] IndustryKG™ / IBB data
- x

Linked Open Data - Subscription Based

- IndustryKG / IBB data
- x
- x
- x

> Triples expressed in RDF with URIs as identifiers

HR & Culture

– Maybe add HR incentives to climb on board

– A community of like-minded DCA advocates

New IT activities that the business will need to fund

- Graph-based architecture

Diminishing activities and activities that will disappear:

- System integration
- Master data management
- Cobol programming and other application languages

The Business Input Needed By Ontologists
aka: the needed dialog between the Business + IT

- List of questions the business wants answered
- Identification of classes + properties
- Sample reports that work today
- Mockup reports desired in the future
- Inventory of systems, applications, and databases
- Start Now With This
  - ➤ PrefLabel
  - ➤ AltLabel
  - ➤ HiddenLabel
  - ➤ skos:definition
  - ➤ skos:example

Three Approaches That Will Work
1. Convert / map everything you do today
2. Ignore current mess and just start from scratch and do in right
3. [Recommended] Start from scratch and do it right but also use existing knowledge of systems and data to spark potentially needed requirements

Business Input Needed By Ontologists *(Continued)*

- When the LOB Manager meets the Ontologist (Conceptual Modeler, Data Modeler, Enterprise Ontologist, Knowledge Representation Engineer, Ontology Builder, Ontology Designer, Ontology Developer, Ontology Engineer, Ontology Modeler, Terminological Knowledge Engineer) ...

 there are six (generic) things the ontologist cares about:

Three Approaches That Will Work
1. Convert / map everything you do today
2. Ignore current mess and just start from scratch and do in right
3. [Recommended] Start from scratch and do it right but also use existing knowledge of systems and data to spark potentially needed requirements

1. There are **Individual Things**
   Google is an individual thing

2. There are **Kinds of Things**
   Corporation is a kind of thing

3. An **Individual Thing** is an **instance** of a **Kind of Thing**
   Google is an instance of a kind of thing — such as a corporatio

4. There are more **Specific Things** and more **General Things**
   A corporation is a kind of company

5. There are **relationships between** two **Individual Things**
   Google is a subsidiary of Alphabet

6. **Individual Things** have **attributes** that **relate them to literals**
   Google's official name is "Google Inc"

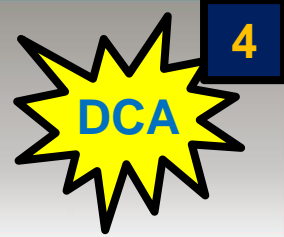**This is all explained in the module "Intro to Ontology for Business Executives"**

from
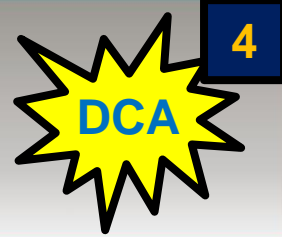
IndustryKG™
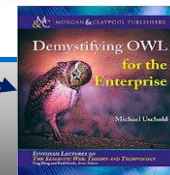
Focus on Corporate Ontology Input

Goal #1: Build a Core Shared Enterprise Data Model

➤ Assumption to ensure high quality: start with gist, a minimalist upper ontology

➤ It's Parti time. A high-level (enterprise-wide, if possible) diagram of key components and their interrelationships

➤ Identify any internal ontologies used in the enterprise

➤ Identify any externally-defined industry ontologies used in the enterprise

➤ Select Industry Sector Ontology, if needed

➤ Identify Classes & Properties

➤ Questions to be answered

➤ Form minting and triple patterns

➤ Prep for creating digital twins

➤ Governance – Classification Management (Classify data)

➤ Tagging

➤ Update and rationalize shareable glossaries in the corporate, group, LOB + shared activity plans. Include homonyms!

➤ Update and rationalize shareable taxonomies in the corporate, group, business unit, and shared activity plans

And Do Some Corporate (Centralized) Stuff

➢ Corporate Systems / Application inventory

➢ Corporate Databases / File Inventory

➢ Corporate Data inventory (with a sense of data quality)

➢ Corporate System interface mapping

➢ Corporate IT Programs & IT Projects Inventory

➢ Corporate Technologies in use

➢ Corporate External data vendors / external data accessed

New Things for the LOBs to Address

➢ Ontology for LOB derivative data model only

➢ Identify Unique LOB Classes and Properties

➢ For needed terms, add prefLabel + altLabel

➢ Competency questions to be answered

➢ Clarify external Linked Data to be used

➢ For each plan – identify critical data elements needing extra quality management + great security

➢ Clarify unique LOB "Data-centric Scenarios" and "Data-centric Use Cases" and "Data-centric Services" (replacing to-be-legacy "applications"

Cost Center Strategic Planning Changes in the Data Centric Era
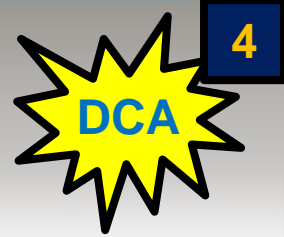
Ontology Input for Traditional Cost Centers

➢ Ontology for Cost Center derivative data model only

➢ Identify Unique Classes and Properties (for this shared activity)

- Example: The Legal Department
- Example: The Accounting Department

➢ X

➢ X

Strategic Planning Support For New Data Centric & EKG Cost Centers
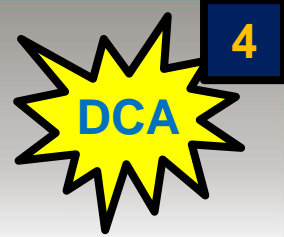
- ➢ New Data Governance Boards
  - ➢ TBox Committee – enterprise controlled vocabulary
  - ➢ ABox Committee -
  - ➢ CBox Committee – internal and external taxonomies and classification systems used across the enterprise
- ➢ URI Minting Committe
- ➢ Ontology & Knowledge Graph Training, Development & Implementation for Business & IT
- ➢ x

Industry Knowledge Graph LLC introduces:

Data-Centric Strategic Planning™

Abilities you may, or may not, have had before:

✓ **Analyze companies by line of business**

✓ **Compare companies at the line-of-business** (five forces) **level**

✓ **Analyze standard government industry classification** (multi-industry economic) **sectors by industry** (for NAICS, and others)

✓ **Analyze industry data including competitors** (by top parent; by market brand; and by brand offering name) **and a long and growing list of other industry data**

Wow!

Questions You Can Now Answer Quickly
(aka: query goals for the SPARQL query language)

Examples:

- Who are the Top Parents competing in a given industry?

- What are the brands competing in a given industry?

- What Industries does a particular company compete in?

- How do two companies compare based on industry portfolio?

- What industry groups make up a given subsector?

- What company uses a given brand

Hey, just let the ontologists know what you want to know.

Industry Knowledge Graph LLC says

Thank you!

Industry Knowledge Graph solution for Business Execs™

Part of our:

Data-Centric Strategic Planning (DCSP) Series