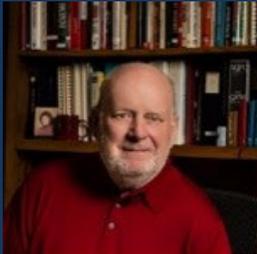# IISE Global Performance Excellence Webinar Series:

Operational Analytics 201: Concept Design for Improved Management Systems and Op Analytics Capabilities

Our Speaker today and our Sponsor:

D. Scott Sink, Ph.D., P.E.
Senior Advisor
The Poirier Group

Scott Sink Linkedin page

IISE Coordinator

D. Scott Sink
IISE Performance Excellence and
Op Analytics Volunteer Lead
Facilitator/Member, CISE

THE **POIRIER** GROUP

Focused Performance Improvement

INSTITUTE OF
INDUSTRIAL
& SYSTEMS
ENGINEERS

27 June 2023

Council on
INDUSTRIAL &
SYSTEMS
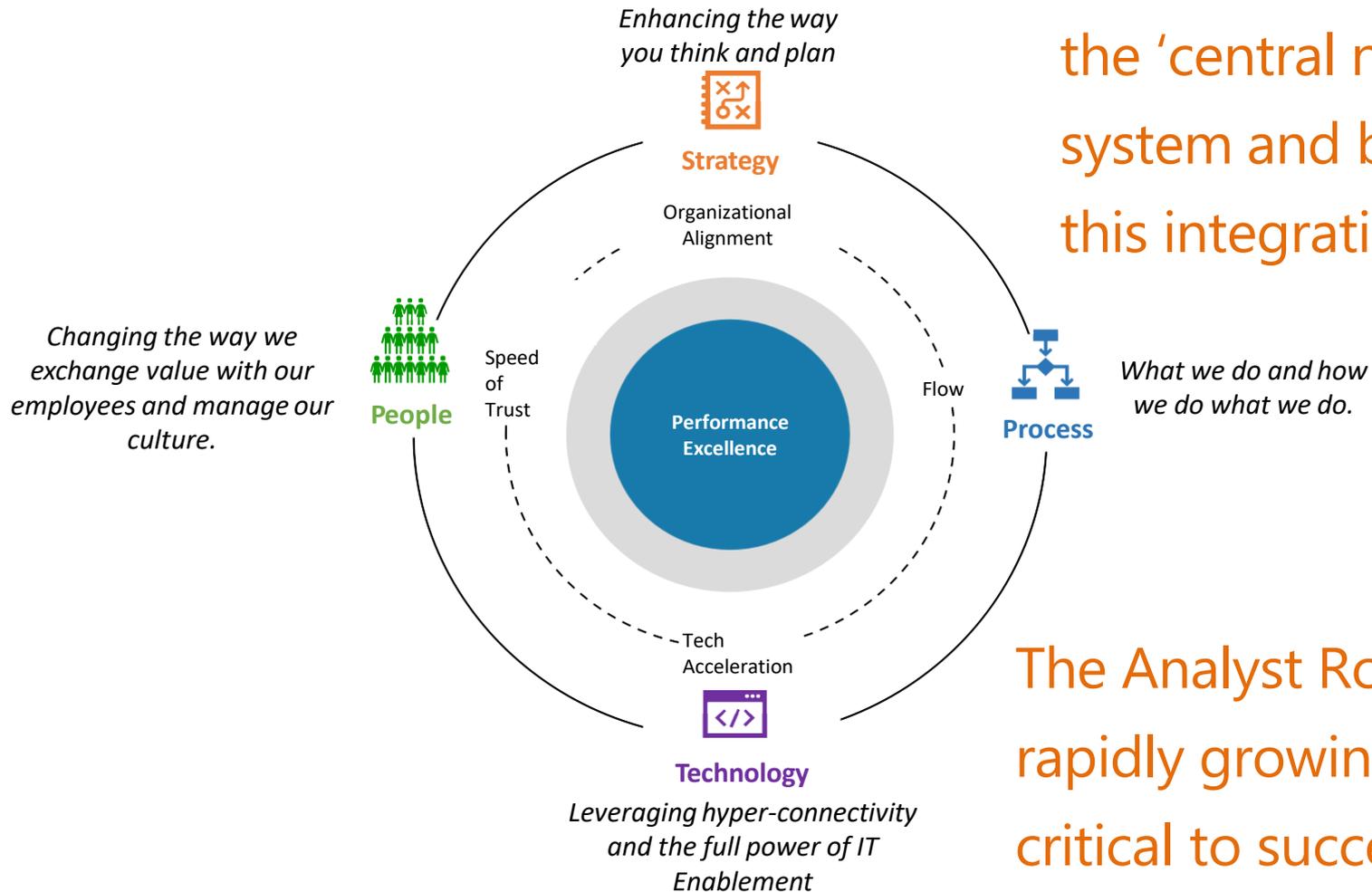ENGINEERING

Agenda

11:30-11:40	Scott to 'tee-up' the session, go back to go forward just a bit
11:40-12:15	Concept Design for Improved Management Systems
12:15-12:25	Respond to questions from audience
12:25-12:30	Scott close out and overview what's ahead in June and July

THE **POIRIER** GROUP

Data and Experience Foundation

- First book written, *"Productivity Management: Planning, Measurement and Evaluation, Control and Improvement"* John Wiley, 1985
    - Based on Dissertation and Consulting and Research completed 1976-1985

- Teaching 'Performance Measurement, Management Systems Engineering, Integrated LeanSigma, Operational Analytics 1978-1997 and then 2007-2020. (Ok State, Va Tech, Ohio State)

- VP Business Process Improvement 2000-2007, leading Op Ex.

- Practicing—directed, coached over 250 business process improvement projects from 2007-2020 in wide spectrum of industries and for wide range of types of performance problems.

- Still learning more every day.

ISE's Create Value by Integrating People, Strategy, Process and Technology

Operational Analytics is the 'central nervous system and brain' behind this integration

Enhancing the way you think and plan

Strategy

Organizational Alignment

Changing the way we exchange value with our employees and manage our culture.

People

Speed of Trust

Performance Excellence

Flow

What we do and how we do what we do.

Process

Tech Acceleration

Technology

Leveraging hyper-connectivity and the full power of IT Enablement

The Analyst Role is a rapidly growing and critical to success function in Op Excellence.

4

Logic for the MSE/OA Foundations

OA 101: Foundations for Building Performance Measurement, Evaluation, Improvement Systems

- Systems Thinking and Process Breakdown Structure

- The 'Management Systems Model' (Management Systems Engineering)
  - Management Systems Analysis (Value Streams and Control Points)
  - Users and Use Cases
  - Decision-Action (Study/Adjust) Requirements
  - Information Requirements & Portrayal, Perception, Insights to Actions
  - Data Requirements
  - Data Management Requirements
  - Data Analytics Requirements
  - Visualization Requirements

- Getting all the System Components in Place to ensure 'End Game' Achieved

Context – The Purpose of Management Systems Engineering

Create, Architect, Engineer, Implement/Deploy improved 'B' systems that drive and enable Process and Performance Improvement Better and Faster.

In the new 'Roaring' 20's it's not if you are getting better, it's how fast.

Building Management Systems to Optimize "B"

A—"Administer", perform the role, run the process as designed, etc.…

C—'Cater' to crises (fight fires).

D—'Do' the Dumb (non-value add, waste, …)

B—"Build" the business, BPI, PDSA, etc.

Common Current State

- 'B' gets squeezed out by 'C' and 'D'

- Low maturity, capability, competence to do systematic 'B'

- 'A' teetering on the brink, high variation in process capabilities

- 'B' portfolio not rationalized, ad hoc and hence impact sub optimized

Mgmt. Systems Eng. & Op Analytics to Build Better 'B'

Desired State

- 'B' is driving 'C' and 'D' out of business, systematically over time

- A Great BPI 'function', Op Ex best in class

- 'A' process capability improving dramatically due to better and faster 'B'

- The 'B' portfolio is aligned to Enterprise Strategy top to bottom and front to back.
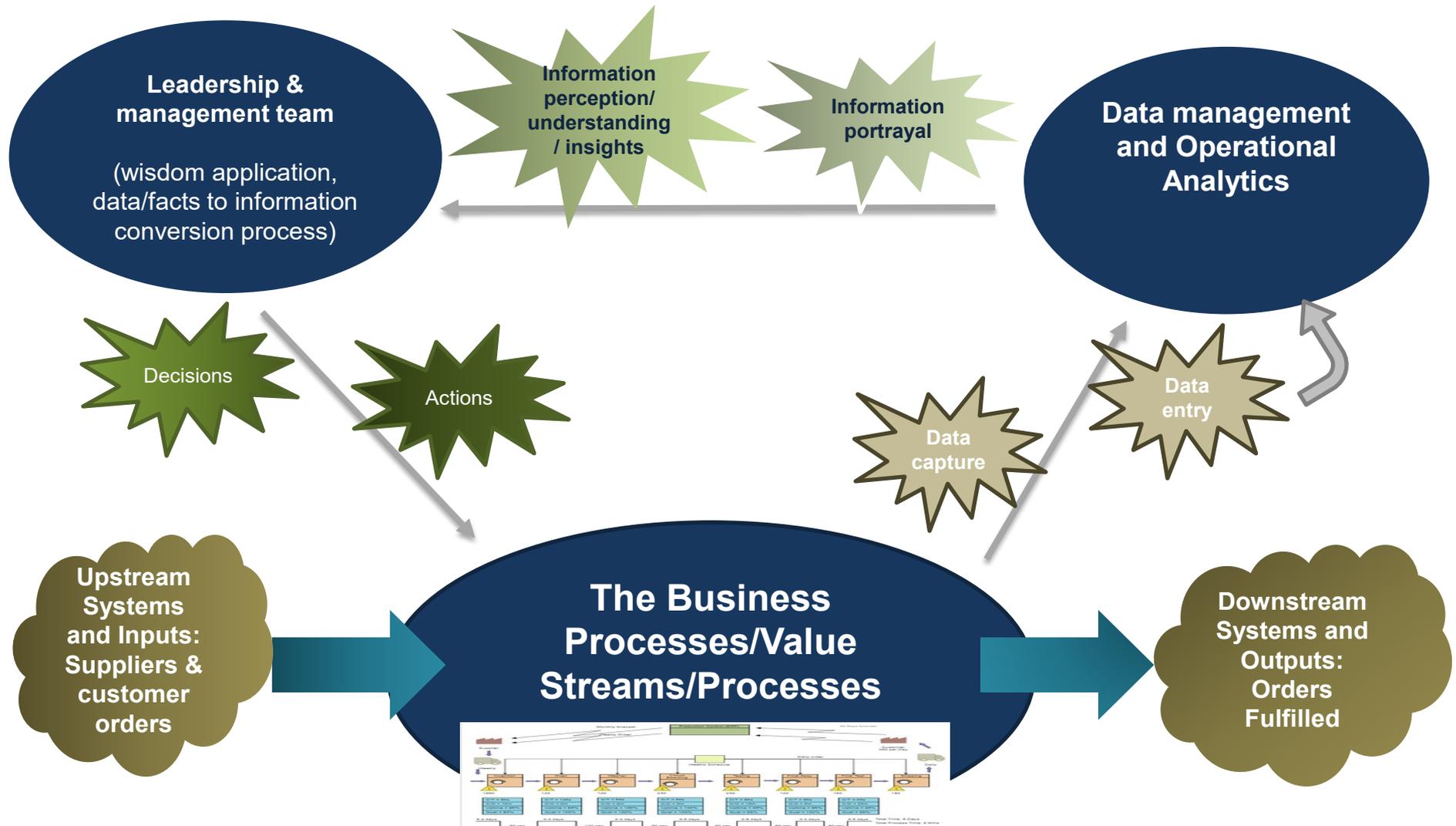
Context – The Purpose of Operational Analytics

Facilitate & Enable the creation of 'solutions' that catalyze and enable better decisions faster

and then drive actions, improvement implementation, faster

and then drive benefits realization faster (desired and positive outcomes)

and then grow Enterprise Value (system, process, business value creation).

# Organizational Systems, Extended Enterprises down to the smallest process is this happening..

Leadership & management team

(wisdom application, data/facts to information conversion process)

Information perception/ understanding / insights

Information portrayal

Data management and Operational Analytics

Decisions

Actions

Data capture

Data entry

Upstream Systems and Inputs: Suppliers & customer orders

The Business Processes/Value Streams/Processes

Downstream Systems and Outputs: Orders Fulfilled

The Organizational System—What's being Managed

An Extended Enterprise
An Org Unit
An Extended Value Stream
A Value Stream or Business Process
An embedded Value Stream or Process
A sub-process

Upstream Systems and Inputs: Suppliers & customer orders

The Business Processes/Value Streams

Downstream Systems and Outputs: Orders Fulfilled
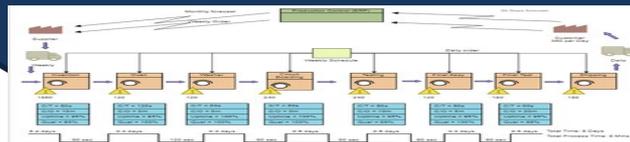
Fundamental Questions in Management Systems Analysis

In the pursuit of 'full potential performance' in your organization, there are some very basic, fundamental questions that must be answered in the context of Organizational Strategy.

- What are the right systems, sub-systems, business processes, processes to focus on? What is our optimal portfolio? What aligns best to our 'Good Strategy'.
  - Lots of ways to create the right portfolio (e.g. Theory of Constraints, Pain Point Analysis, Value Stream Analytics to name a few)
- How does the 'focal' system/process work?
- How does it perform (the focus of Operational Analytics)
- How do we best improve performance as we've operationally defined it? (e.g. mAIc)
- Is Enterprise Value Growing? How do we know?

Methods, Tools to use

- SIPOC
- End2End Value Stream Mapping
- Business Process Breakdown Structure
- IDEF
- Observe, walk the process, structured interviews
- Butcher Block or Miro the Value Stream/Swim Lane
- "Smart" Visio, use layering to add or take away detail, zoom in and zoom out capability

# Predecessor – knowing the business processes (and interaction effects)

Organizations may have multiple legal entities, operational entities, international entities, shared services that support some (but not all), and embedded services in operations

Corporate processes organized by department
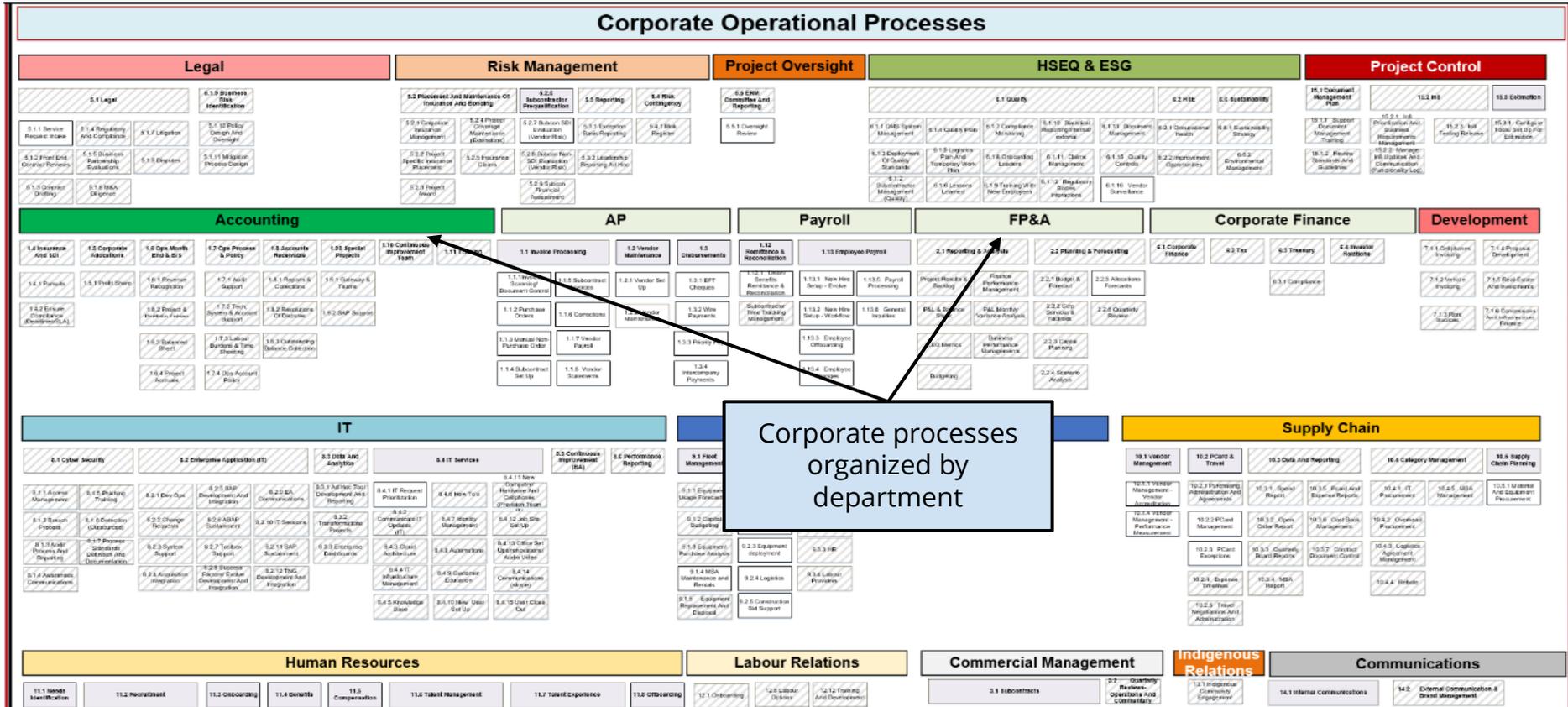
The financial view is just one view – interaction effects are critical, especially when understanding corporate allocations against shared services, budgeting, capex disbursement and when doing cross-functional business cases

One layer deeper on processes...

Complex organizations often have support entities in corporate op's or shared services alongside traditional operations. Changes to one impact the other (and vice versa)

Corporate processes featured as process steps within key cross-functional processes.
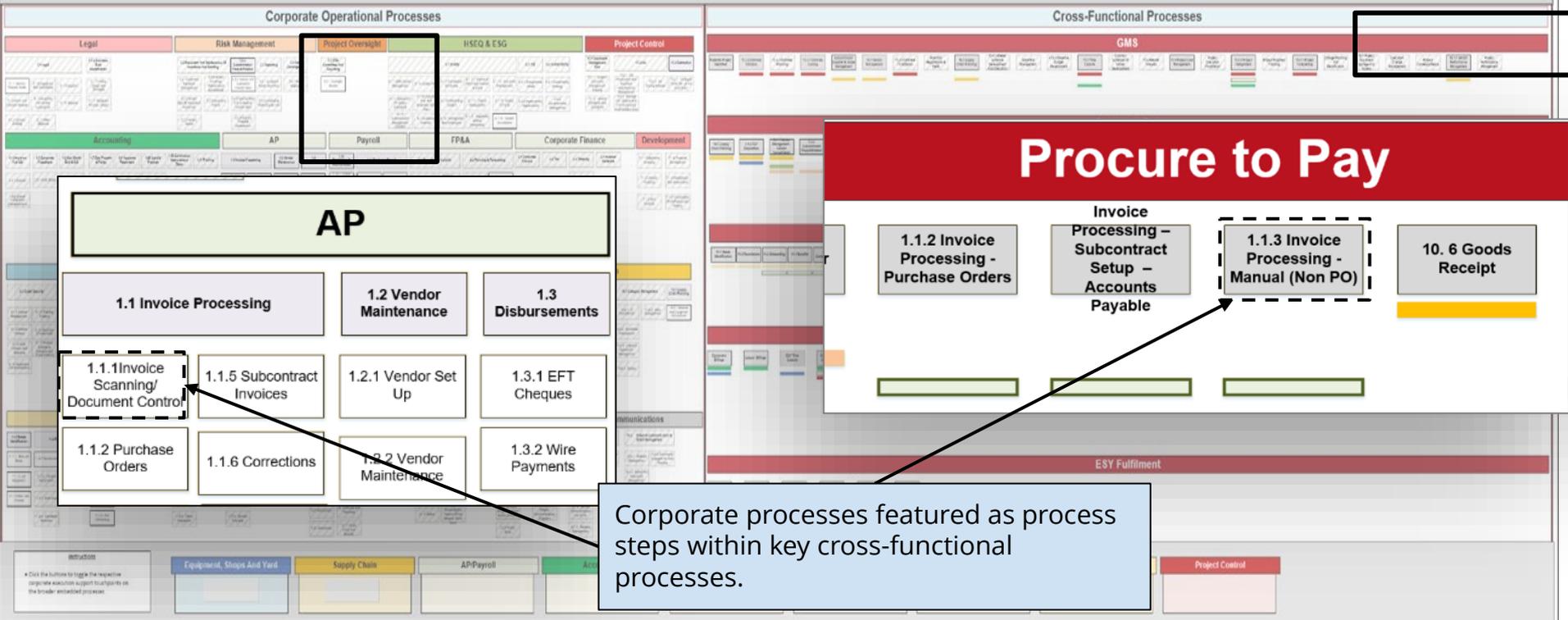
What dimensions of the organization benefit from speeding up the procure-to-pay lifecycle? What about AP or AR?
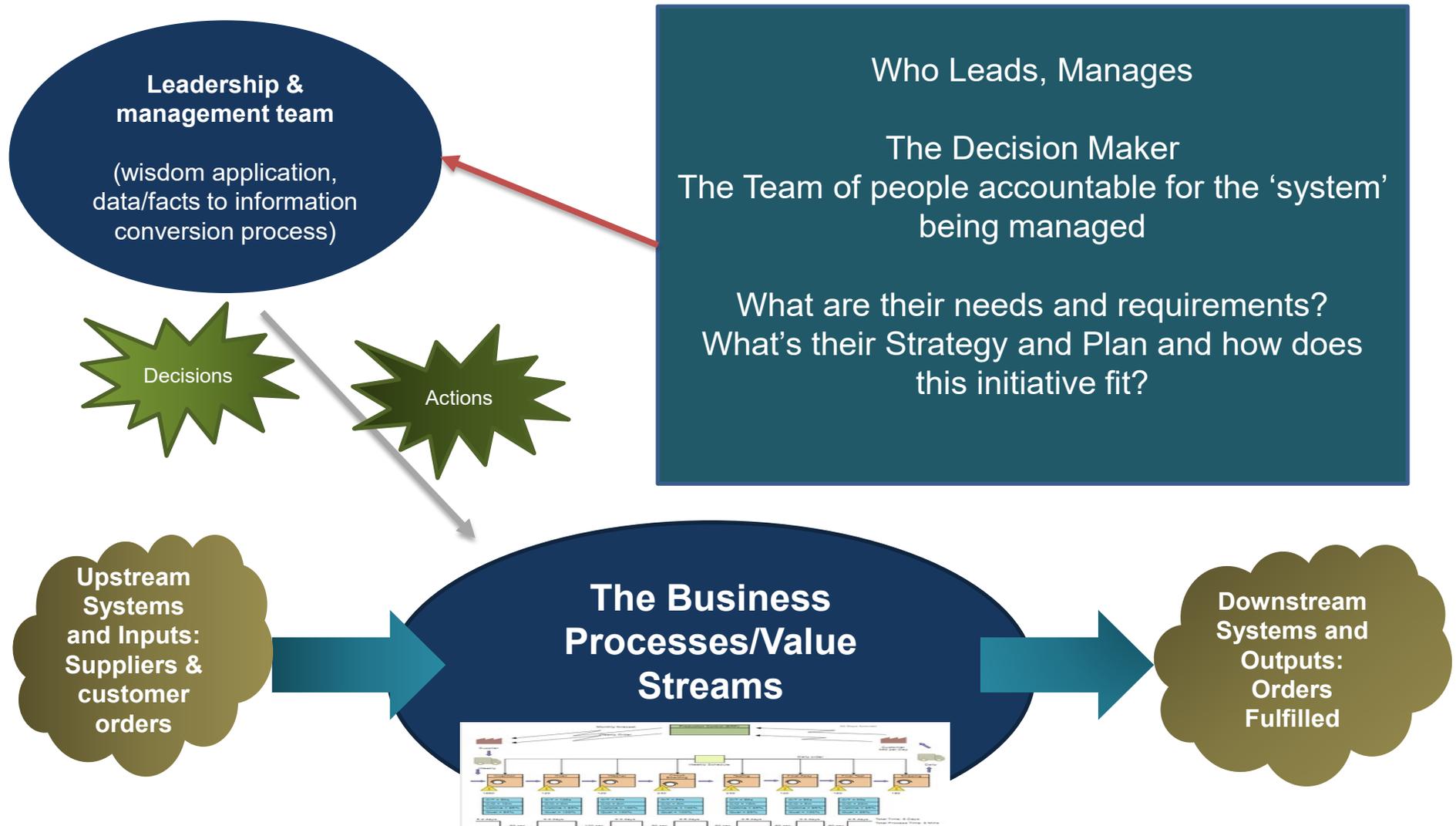
Hospital Flow as a System
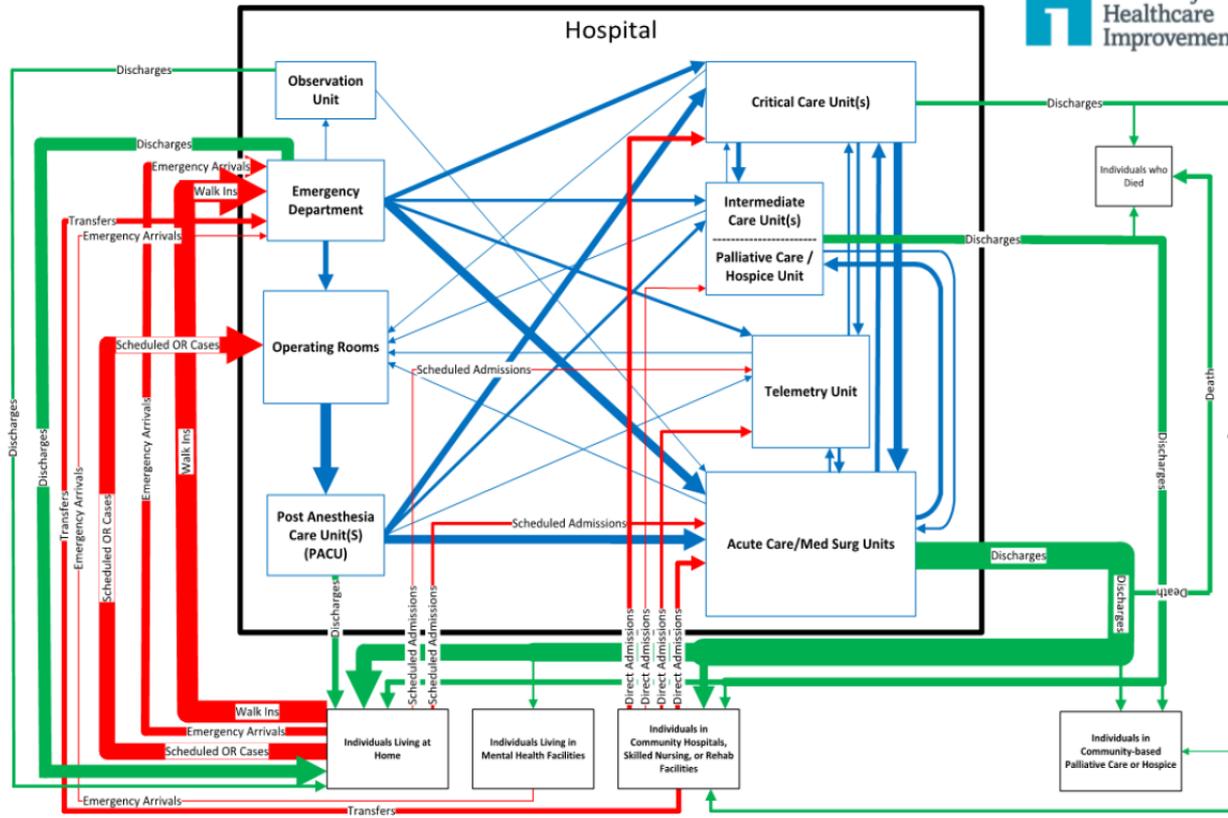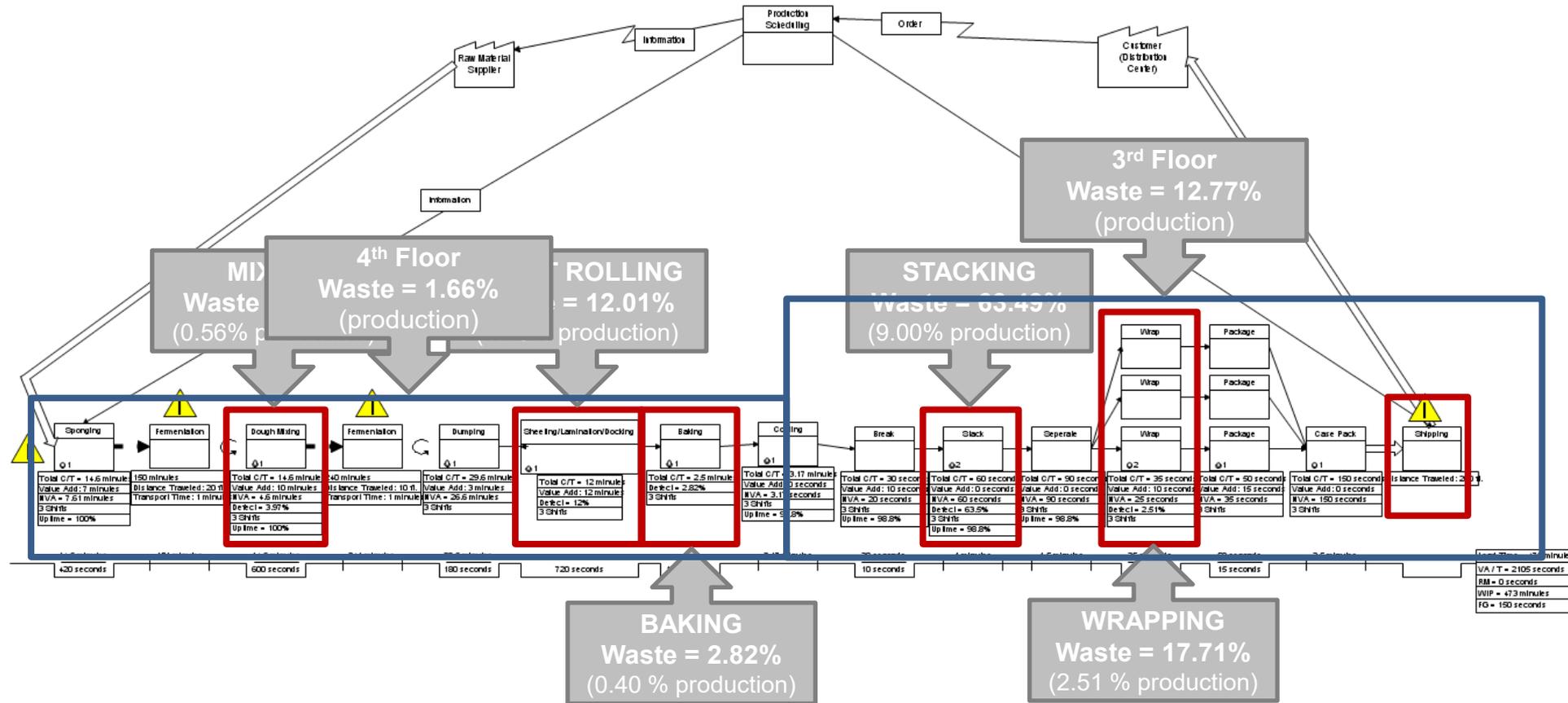
This problem is nothing new and has actually been the focus of prior improvement projects.
We will take a look at 2 project that have sought to reduce the process variability and in turn, reduce waste.

The Management Systems Model—who Manages and how we provide better Decision-Action/Study-Adjust support

Leadership & management team

(wisdom application, data/facts to information conversion process)

Decisions

Actions

Who Leads, Manages

The Decision Maker
The Team of people accountable for the 'system' being managed

What are their needs and requirements?
What's their Strategy and Plan and how does this initiative fit?

Upstream Systems and Inputs: Suppliers & customer orders

The Business Processes/Value Streams

Downstream Systems and Outputs: Orders Fulfilled

Understanding 'Who's Leading & Managing'

- Use Case application
- Design exercise, hence pull requirements, wants, needs
- Understand the system so you can identify requirements, things that are felt but can't be or aren't being articulated—earn your value contribution—be curious and think!! Google—learn
- Interview and then organize/structure what you hear and spit it back

- Elicit what they don't know that they want to know,
  - what questions they have they can't or aren't easily answering,
  - what are their obstacles to improving things,
  - how do they want to see things,
  - what's the right periodicity on Study-Adjust,
  - what are their information requirements,
  - what are the things that if they better understood would help them take the 'system' to another level of performance
  - What do they see as the control points
  - Etc., etc.

Another tact on 'Balanced Scorecards' (Instrument Panel in Cockpit)

HUD: Effectiveness—what are the right things to DO (Start's & Stop's)

Our Future State Vision

HUD: Effectiveness— What are the right things to DO (Continues)

Bank 0: Enterprise Value

Bank 1: Profitability/Budgetability

Bank 3: Innovation Lever—Rate of Improvement

Bank 2: Efficiency—Resource Utilization, Optimization

Bank 4: Productivity

Bank 5: Quality$_1$

Bank 5: Quality$_2$

Bank 5: Quality$_3$

Bank 5: Quality$_4$

Bank 5: Quality$_5$

Bank 4: Quality of Work Life/Culture

The Management Systems Model—information requires data, the data management role

Leadership & management team

(wisdom application, data/facts to information conversion process)

Information perception/ understanding / insights

Information portrayal

Data management and Operational Analytics

Data Organization

Decisions

Actions

Data entry

Data capture

Upstream Systems and Inputs: Suppliers & customer orders

The Business Processes/Value Streams

Downstream Systems and Outputs: Orders Fulfilled

What data do you need ?

Fundamentally, this step is the 'Data Management' Role in Op Analytics.

You have to systematically think through what data you need to provide the information required for the Lead/Mgmt Team to do Study-Adjust better, faster.
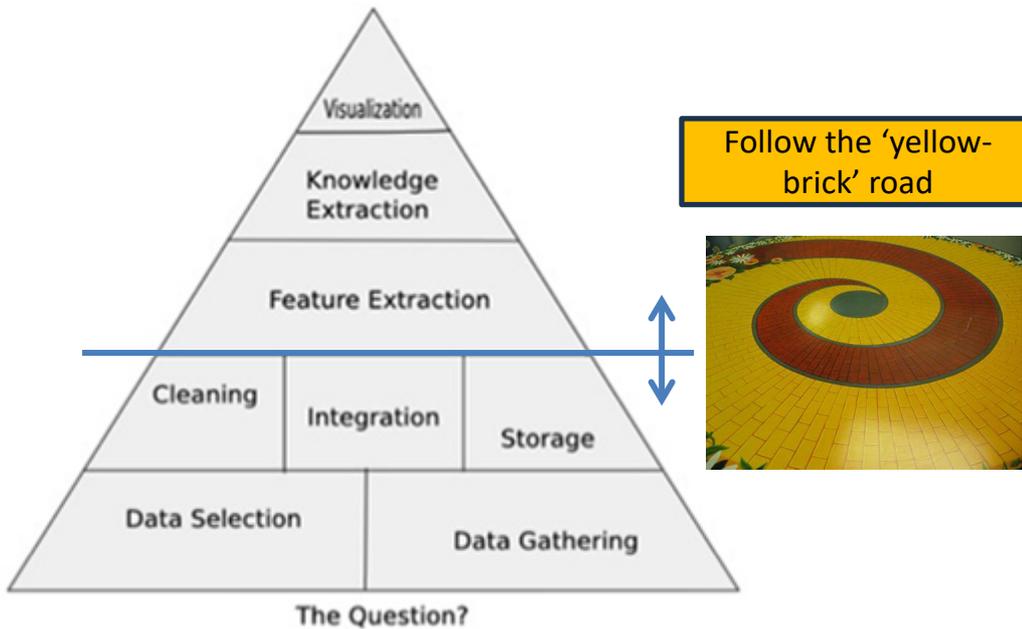
Introducing the OA Triangle Model

The Question?
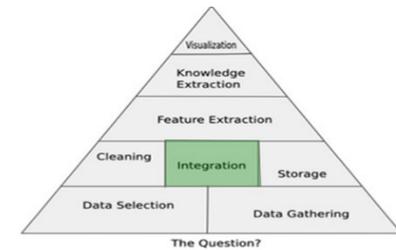
Follow the 'yellow-brick' road

- Most ISE/ILSS Process Improvement Projects require that the ISE/Belt do both roles, certification requires that
- Data is almost never stored in a common place and are not trusted nor available

- the current state process in many large organizations splits data and analytics
- Data are stored in a common place, and are trusted and available

- **"Above the line" analyst role**
  1. What are the fundamental Questions that have to be answered?
  2. What data elements do those questions require?
  3. Organize the data and facts and then export to your analytics app.
  4. Extract features from data through integration and manipulation of data that move us closer to answers. (torture the data)
  5. Apply business acumen to data & analyses – create new knowledge
  6. Apply data visualization techniques to aid in telling the right story – as in life, so in business: the best story wins …

- **Foundational data role**

  1. What do we need to know in order to achieve the performance objectives—what are the questions we have to answer?
  2. Architect/Create the Measurement and Analytics Plan (Data Model included)
  3. Select and gather data from many sources, preferably through automated extract, transfer, & load (ET&L) process
  4. Create (observation, interviews, etc.) any data elements that don't exist (ISE Measurement)
  5. Assure data are cleaned & ready for analysts or you to use – data quality monitors
  6. Assure data are integrated & can be joined with other data – think LEGOs
  7. Assure data storage is high reliability & user-friendly – SSAS cubes, databases
  8. Integration and organization of foundational data elements as well as derivative data and other key metrics of interest

Zooming in on the Bottom Half
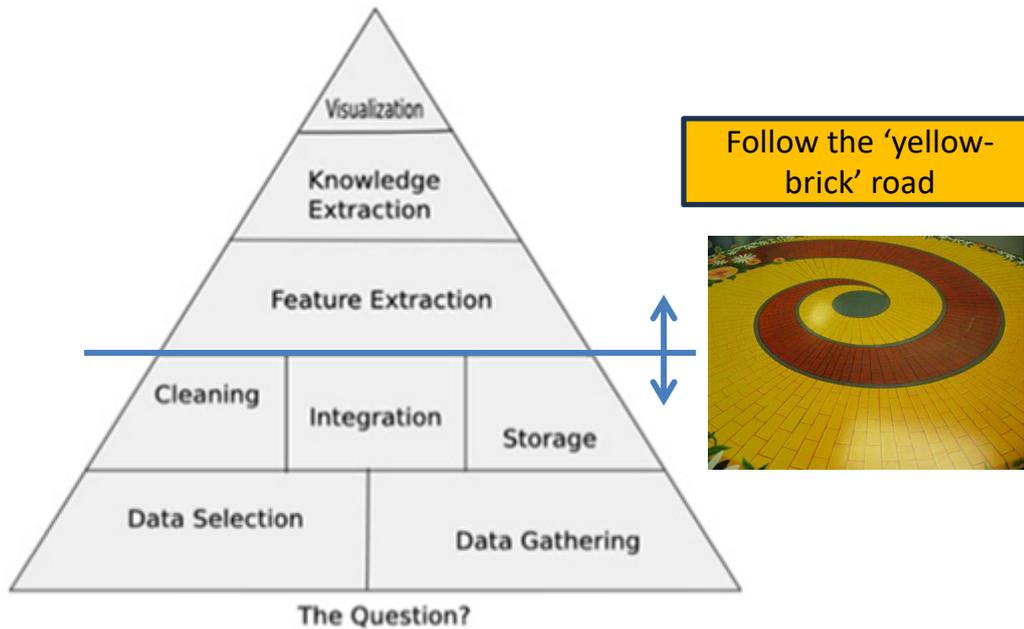
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Data Integration – Challenges
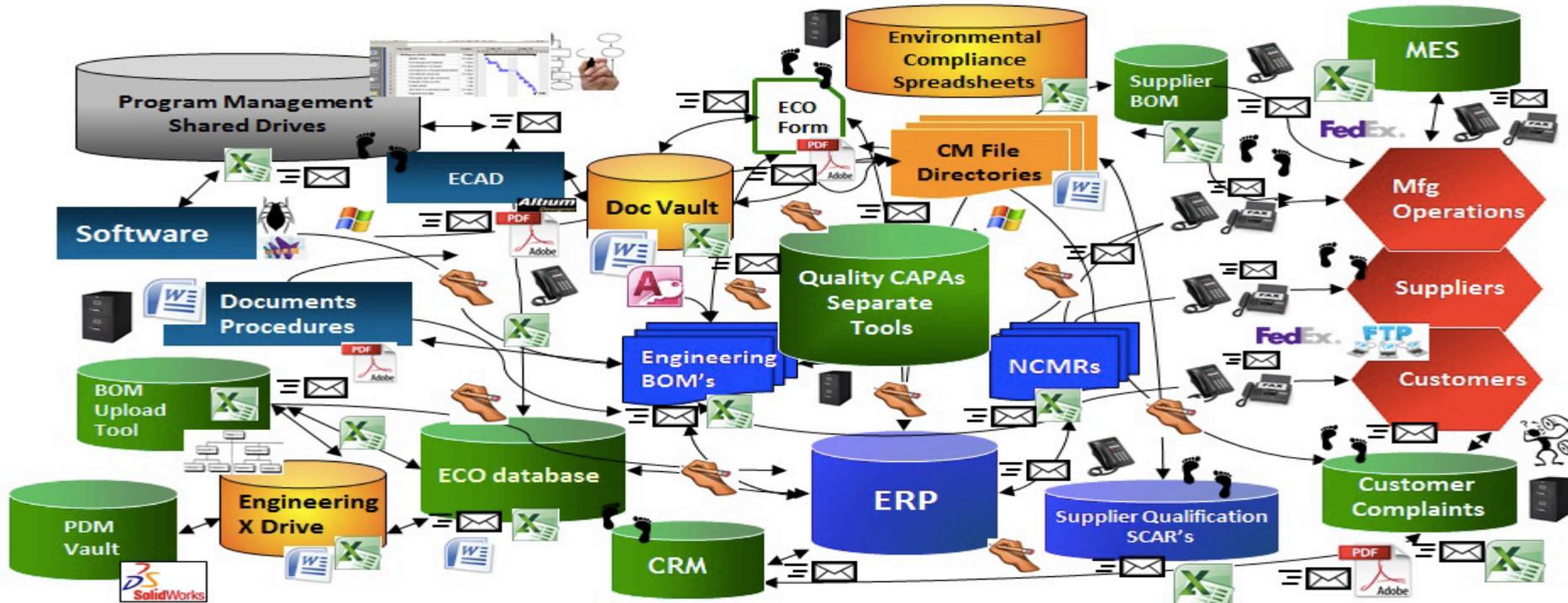
Moving from Big Data to Operational Analytics
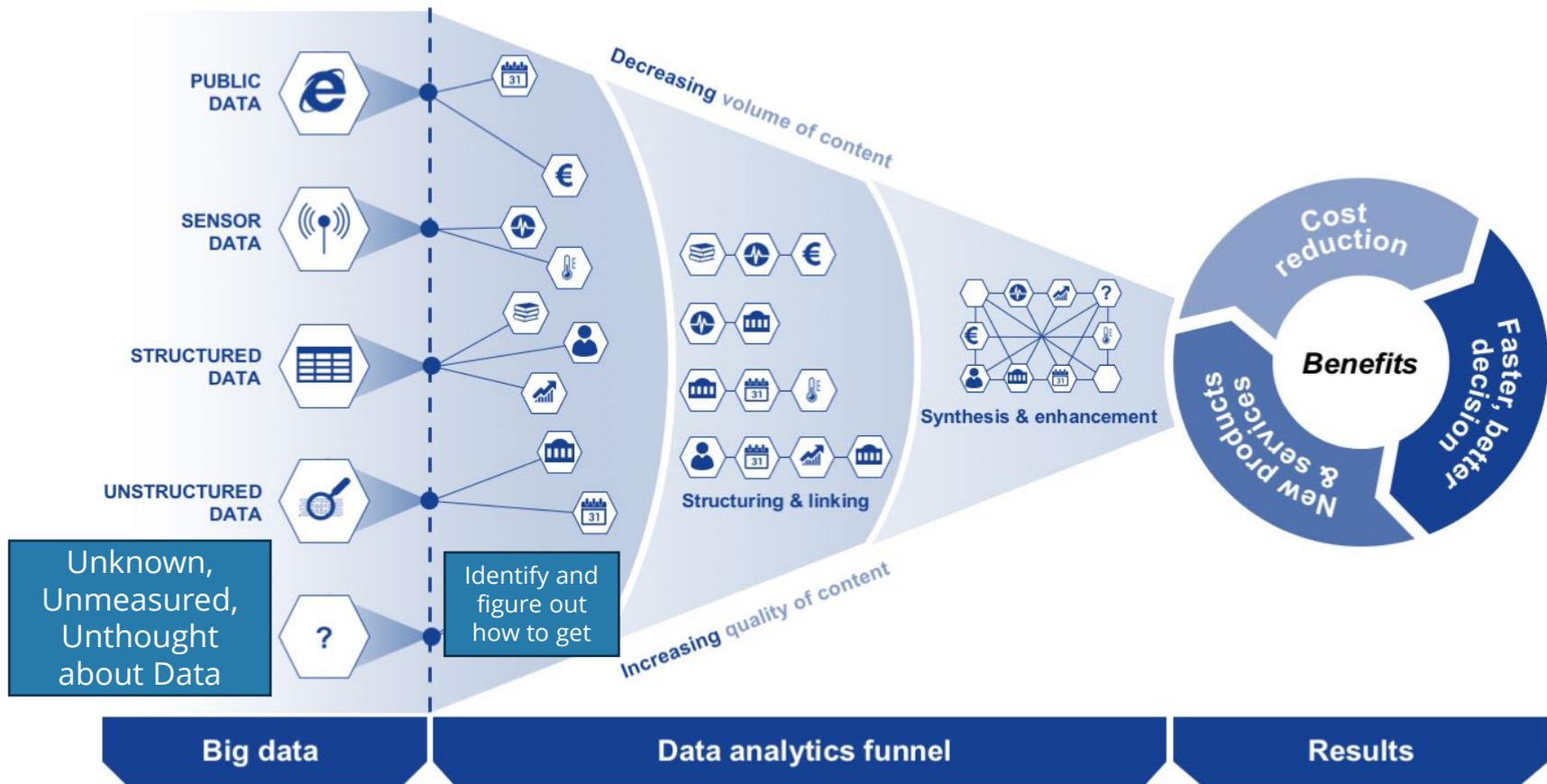
Logic for the Mini-Series and the Certification Program

OA 101: DEFINE--Foundations for Building Performance Measurement, Evaluation, Improvement Systems

- Systems Thinking and Process Breakdown Structure
- The 'Management Systems Model' (Management Systems Engineering)

OA 201: CONCEPT DESIGN--

- The 'Operational Analytics' 'Triangle' Model
- The 'Questions', where do we start with Op Analytics Development Projects?
  - Picking the right improvement projects, Portfolio Management, Using Op Analytics as a tool for picking the right improvement projects (how Op Analytics helps with P and S)
  - Seeing, understanding Op Analytics as an integral component of the PDSA, System and Process Improvement Methodology and work
- The Data Design, Development, Management Role
  - Concepts to help with data modeling, data 'base' development
  - Creating the foundation upon which Analytics Tools sit and can be fully utilized
- The Data to Information to Insights Role

Rounding the Corner on the Model is a Critical to Success Skillset for the Analyst
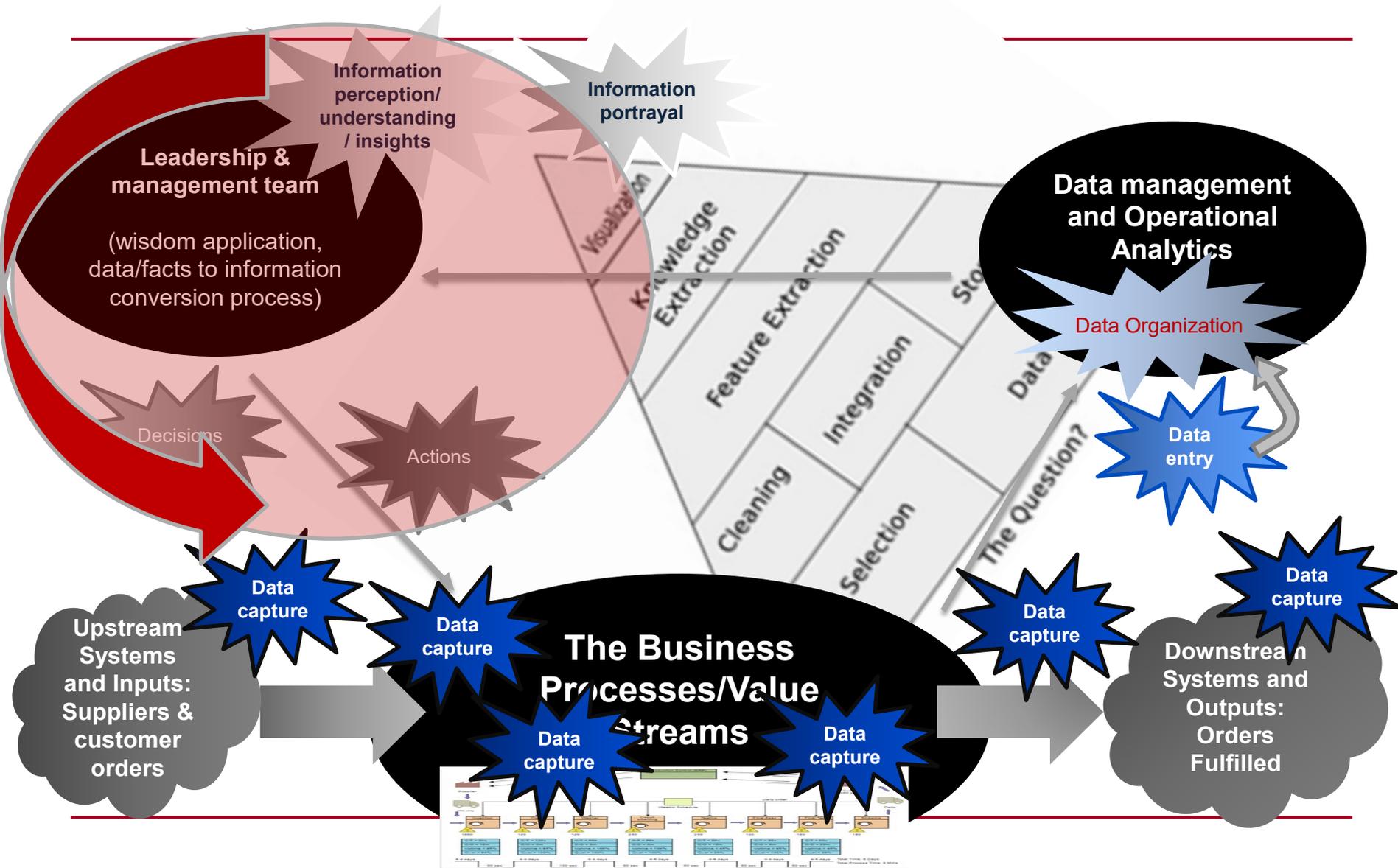
Key points

- **Good Analytics from good context understanding**—use case clarity, good problem statements, clear understanding of DONE, what information is required and why;
- Some people have all the skills required for good Operational Analytics—business acumen, data management, analytics, decision and action support—to perform solid Operational Analytics. But it is a **slow 'craft' development process** for most. **Picking the right people will be a key success factor.**
- **Investment in the right data foundation** has a positive ROI, as analysts can help leaders and managers move faster when data is trusted resulting in faster benefits realization and growth in enterprise value.
- **Good data visualizations** can tell the right story quickly because people are predisposed to believe what they can see and quickly grasp.
- There is a very positive ROI that comes from getting Operational Analytics well designed and developed (engineered)—**small analytics teams can wield disproportionate influence on the bottom line.**
- Good Operational Analytics **provokes more timely decisions and actions**. And simple and persuasive/influential beats complex/ambiguous every time.

- Driving Results that are Sustainable
  - Much work ahead but will come quickly

- Study-Adjust:
  - Strong Alignment on the need for this
  - Need BPI tiger team to point the way

- Data Analytics:
  - Lots of work to do, directionally correct

- Data Management:
  - Solid foundation to build on

Results and Benefits Realization

Decisions-Actions

Insights Under-standing

Visualization

Knowledge Extraction

Feature Extraction

Cleaning | Integration | Storage

Data Selection | Data Gathering

The Question?

Most Org's 'Reports' are, at-best, feature extraction

Objective 1: build out the capability to do the top half of the Op Analytics Process DO-TRAIN/COACH Approach)

Results and Benefits Realization

Decisions-Actions

Insights

Understanding

The Questions

Visualization

Knowledge Extraction

Feature Extraction

Cleaning	Integration	Storage
Data Selection	Data Gathering	

The Questions/Needs
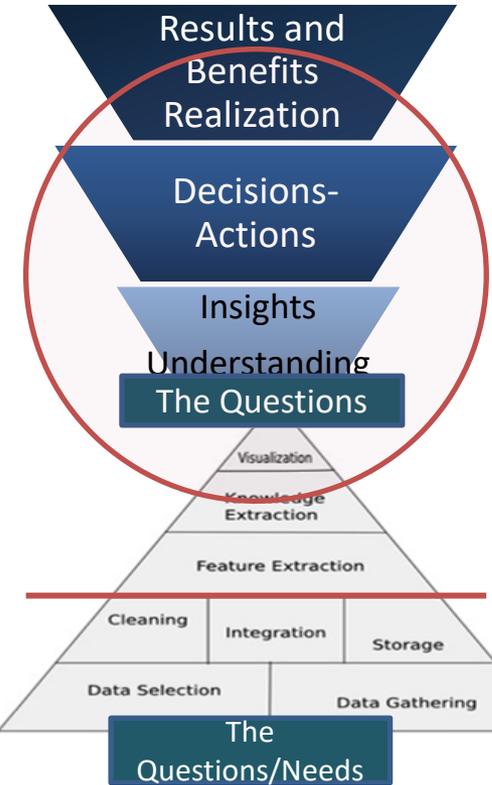
The Development Team:

The Implementation Science and Benefits Realization Role doesn't exist yet (PMO)

The Development Support Team:

The Analyst Role: doesn't exist yet

User Interface to Power BI output: (Marilou Bergevin)

The Data Management Role: (Jim Coleman)
Data Sources, MMS, SQL tables, Query tools, and what's called Feature Extraction in the form of Reports/Tables/some charts

We need to get this going from top to bottom instead of bottom to top!!

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Steps in the "Build" of better PDSA systems

✓ **Operational Analytics (PBI & Sharepoint & Huddle Boards)**

Understand the Voice of Users

2

4

WORK IN PROGRESS (WIP)

Leadership & Management

Information Perception

Information Portrayal

Data Portrayal

Data Management

Data Management

✓

3

5

Decisions

COMING SOON

Data Entry

Collect, Store, 'Manage' Data for Op Analytics

Huddles & Study-Adjust

Actions

Data Capture

Suppliers Customers

Peavey Positioning Value Exchange Management Operational Excellence

Customers

1

Map & Analyze the Value Stream

WORK IN PROGRESS (WIP)

Getting to Visualizations that create insights (aha moments) that provoke timely decisions and actions and improvements is the key
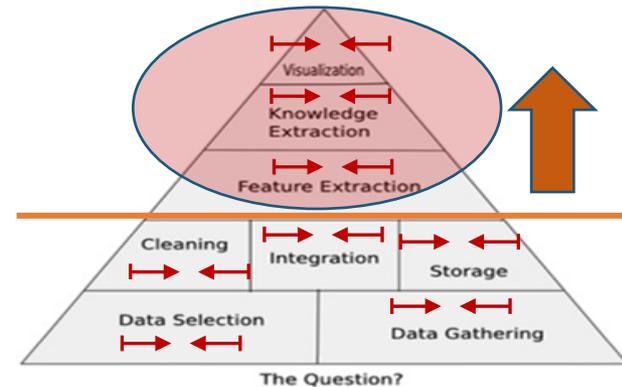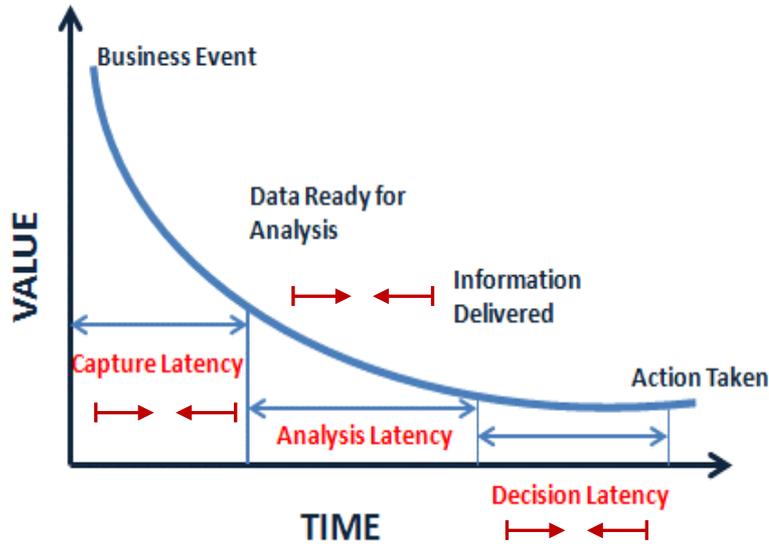
Must do, Accelerate ability to cycle bottom to top on the OA Triangle

- Improved Alignment of OA work with Strategy—better portfolios due to leveraging better OA
- integrate data creatively, from multiple sources, rapidly using best tools available
- Visualizations <u>must</u> minimize the latency to get to the **"Ah-Ha" moment and then drive the causal chain to Benefits Realization**

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Introducing the OA Triangle Model

Visualization
Knowledge Extraction
Feature Extraction
Cleaning | Integration | Storage
Data Selection | Data Gathering
The Question?

Follow the 'yellow-brick' road

- Most ISE/ILSS Process Improvement Projects require that the ISE/Belt do both roles, certification requires that
- Data is almost never stored in a common place and are not trusted nor available

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The Basic Roadmap for the OA Triangle

- **"Above the line" analyst role**
  1. What are the fundamental Questions that have to be answered?
  2. What data elements do those questions require?
  3. Organize the data and facts and then export to your analytics app.
  4. Extract features from data through integration and manipulation of data that move us closer to answers. (torture the data)
  5. Apply business acumen to data & analyses – create new knowledge
  6. Apply data visualization techniques to aid in telling the right story – as in life, so in business: the best story wins …

Simple view of what's happening

The Difference between Creating a bunch of Power BI Reports and Migrating to Aha Moment Visualizations, Insights, Provoking timely Study-Adjust/Decisions-Actions

DATA

SORTED

ARRANGED
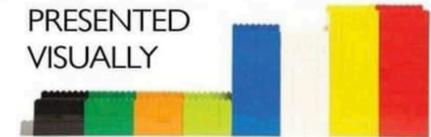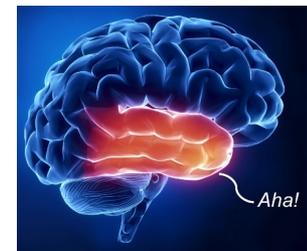
DATA

SORTED

ARRANGED

PRESENTED VISUALLY

EXPLAINED WITH A STORY

Aha!

Example of data integration—hard work but rewards are worth it

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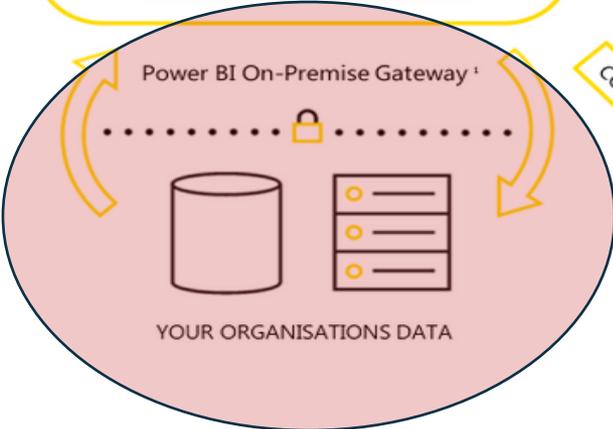
Power BI dataflow (Part of Evolution of BI)

Self Service BI

OLTP Systems

Data Warehouse
Data lake

Report and Dashboard

Data Preparation / ETL

OLAP / Analytics Models
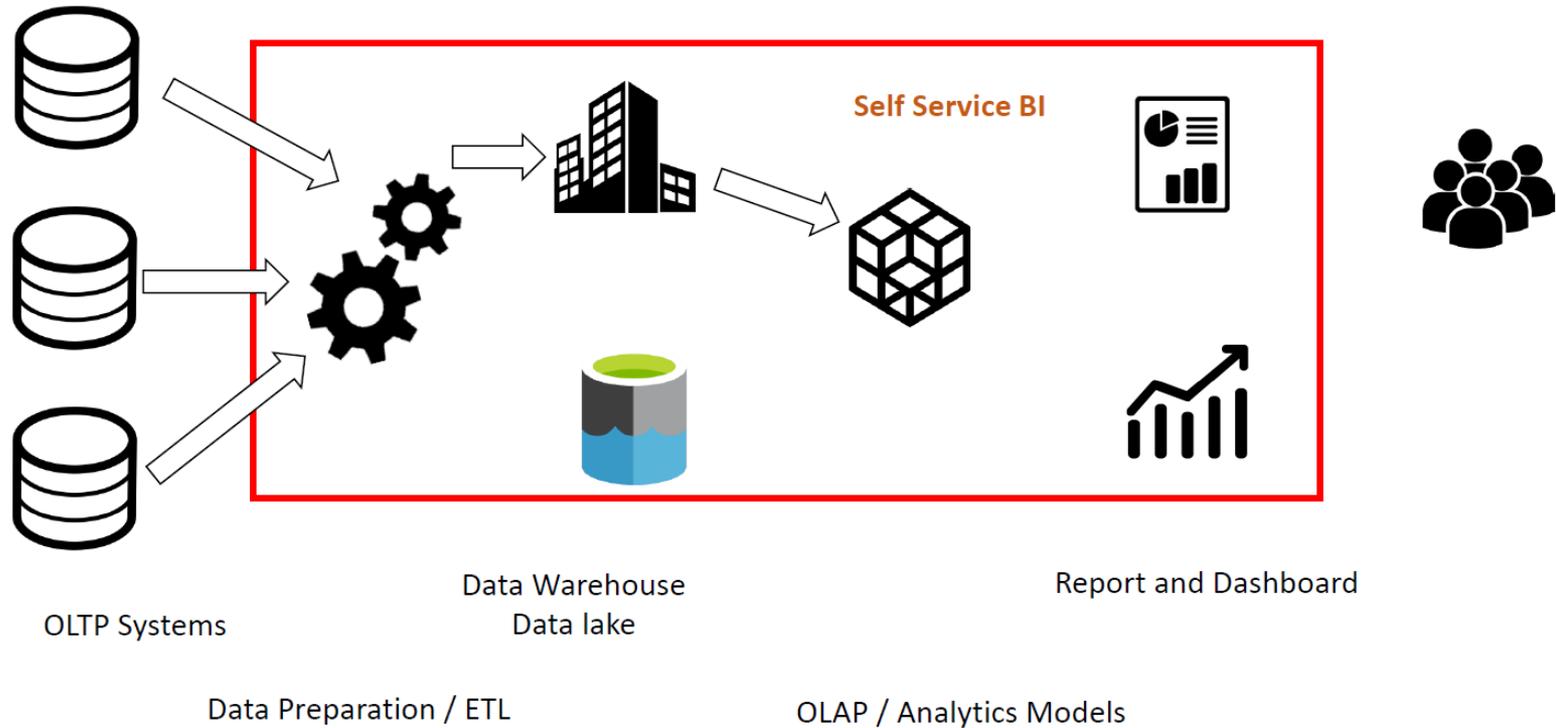
More detailed look

Power BI 2.0 Architecture
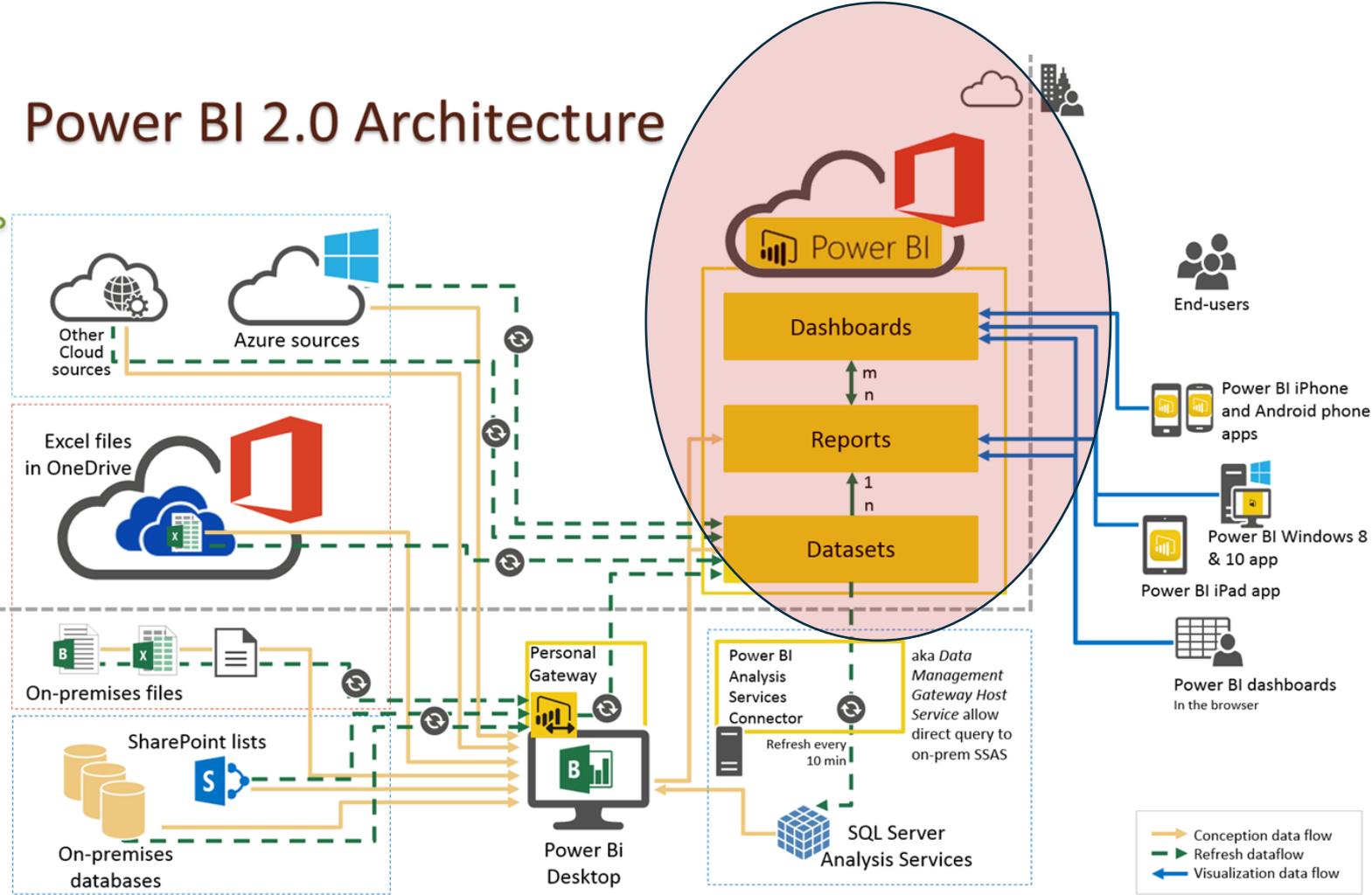
Converting Data to Information to Insights to Decisions-Actions:

The Study-Adjust Process
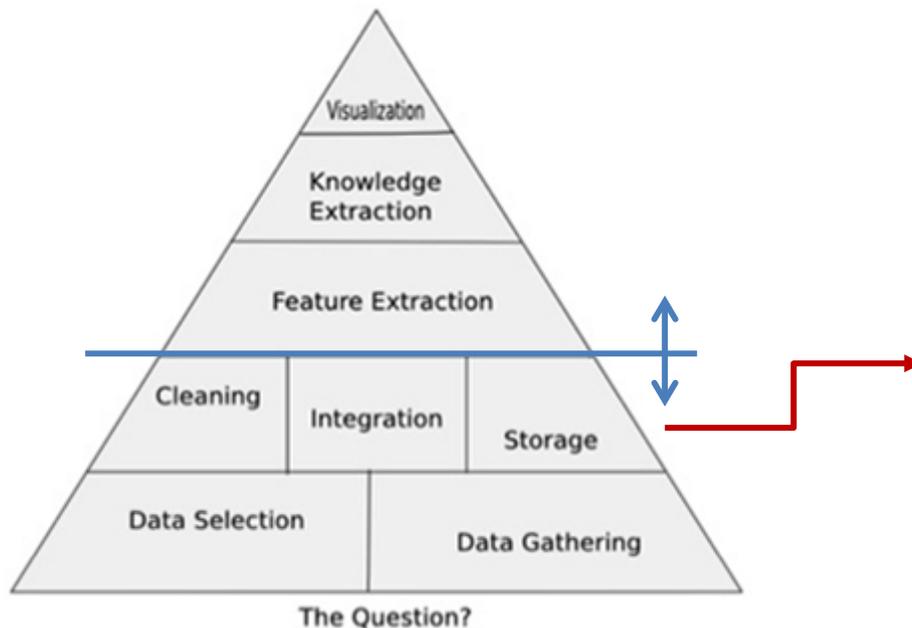
Data Munging and Wrangling

The terms "Data Munging" and "Data Wrangling" (also refers to "data cleaning") are common terms in the world of programmers and researchers. They are interchangeable and refer to the manual conversion of raw data into another form that makes it easier for the programmer, researcher, and others to understand and to work with. This process also involves what is referred to as the "mapping" of raw forms of data or data files (e.g., txt, csv, xml, and json), and applying it to another format.

During the course of performing data analysis and visualization, the performance of which are referred to as "data science," researchers often face the creation of messy data sets, and this is especially the case with larger and more complex data sets. Data munging, therefore, describes the process of sorting through either small or large data sets, which can become messy and disorderly, and "cleaning" it up or manipulating it. This process is often accomplished with the aim of creating a final or...

DATA

SORTED

ARRANGED

PRESENTED VISUALLY
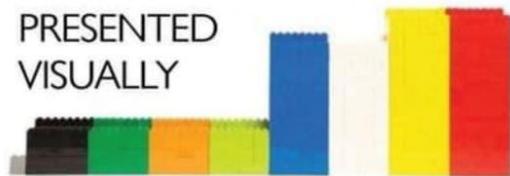
EXPLAINED WITH A STORY

The Data Management Role

The Bus Intelligence, Analyst, Decision Support Role

proschool
An (ims) Initiative

DATA SCIENTIST
MUST-HAVE SKILLS

MATH & STATISTICS

• Machine Learning
• Statistical Modeling
• Exploratory Analysis
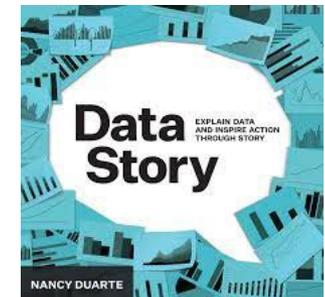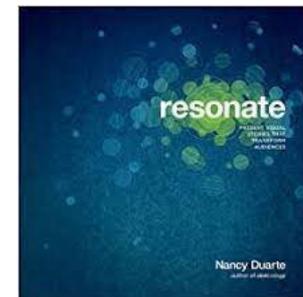• Clustering
• Regression Analysis

PROGRAMMING & DATABASE

• Computer Science Fundamentals
• Database Management System
• Data Visualization
• Python
• Big Data

DOMAIN KNOWLEDGE & SOFT SKILLS

• Inclination towards business operations
• Keen on working with data
• Problem solver
• Strategic, proactive, and cooperative
• Interested in hacking

COMMUNICATION & VISUALIZATION

• Storytelling skills
• Convert data-based insights into decisions
• Collaborative with Sr. Management
• Knowledge of tools like Tableau
• Visual art design

resonate
Nancy Duarte

Data Story
EXPLAIN DATA AND INSPIRE ACTION THROUGH STORY
NANCY DUARTE

Converting Data to Information to Insights to Decisions-Actions:

The Study-Adjust Process

Pyramid from top to bottom:
- Visualization
- Knowledge Extraction
- Feature Extraction
- Cleaning | Integration | Storage
- Data Selection | Data Gathering
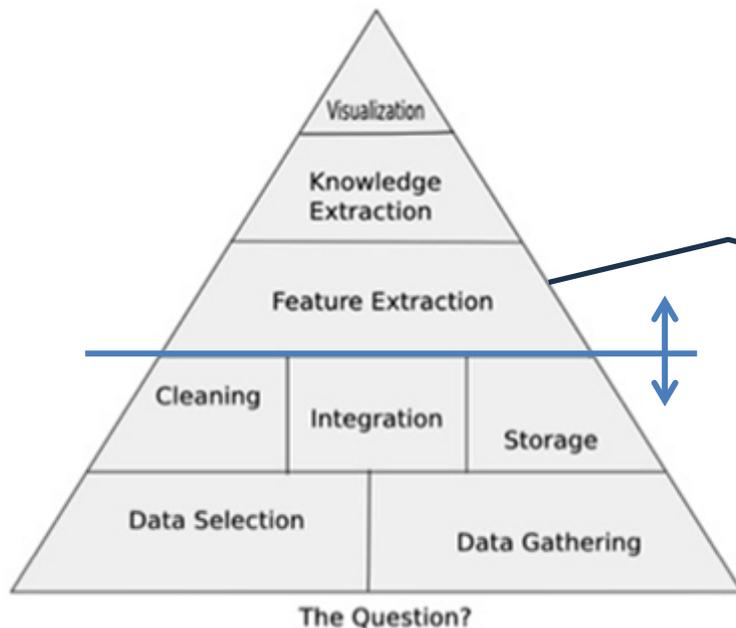
The Question?

Feature Extraction:

- …is the selection of data elements of interest, key performance indicators, measures of interest and is based on 'The Questions', The Use Cases and User Requirements relevant to the improvement work and the 'system' focus.

- A 'report' in Power BI is an example of feature extraction.

- It is essentially data base portrayal with the ability to 'slice and dice', sort, filter, organize, etc.

Common Issues/Failure Modes:

- Report proliferation, Data Rich and Information Poor.
- Get Stuck in/with Feature Extraction.

# Converting Data to Information to Insights to Decisions-Actions:

The Study-Adjust Process
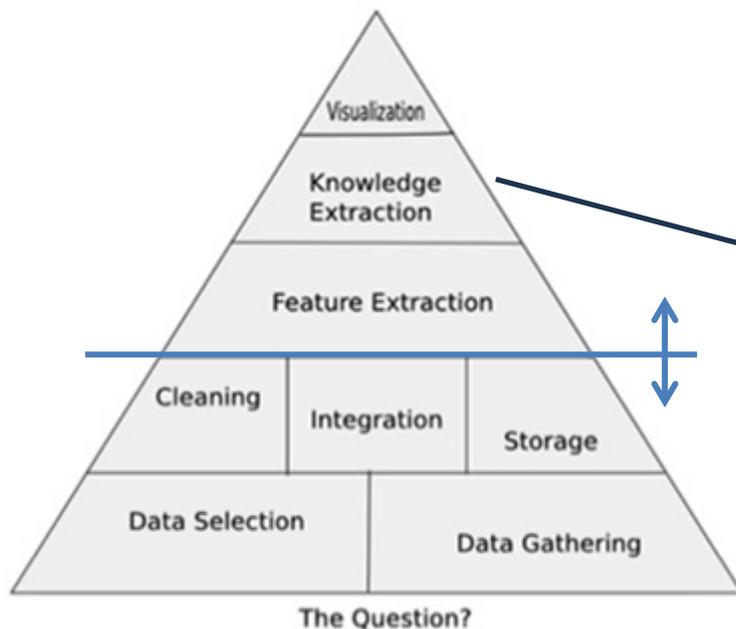
Knowledge Extraction:

- …is the conversion of data portrayal to information portrayal. The basic distinction is that information is directly 'usable', one has an answer to a question and/or can act on the basis of what they 'see', now know.

- A simple question I always ask is whether the 'portrayal' is just a 'so what' to users. Nice to know but it doesn't provoke doing (or not doing) something.

Converting Data to Information to Insights to Decisions-Actions:

The Study-Adjust Process

Pyramid (bottom to top):
- The Question?
- Data Selection | Data Gathering
- Cleaning | Integration | Storage
- Feature Extraction
- Knowledge Extraction
- Visualization
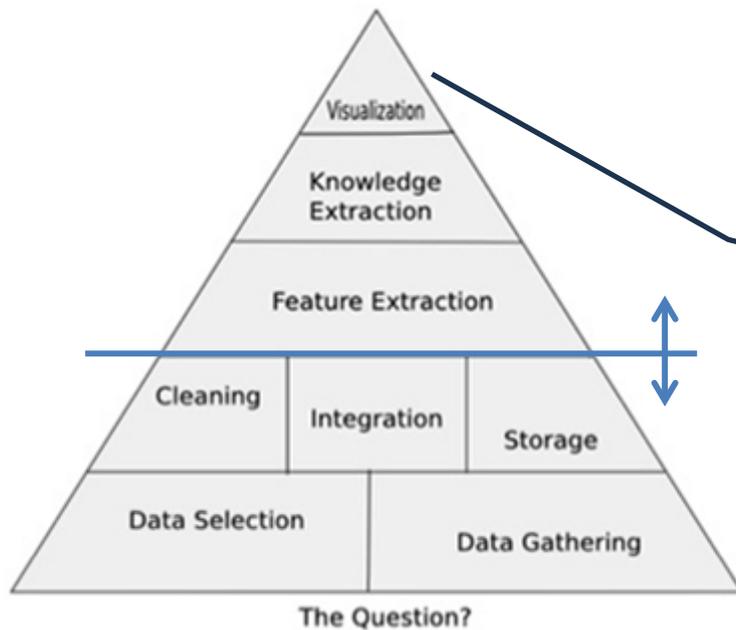
Visualization Science & Art:

- …is all about 'how you portray' the information so that the 'knowledge' produces results…

- It's the art of storytelling, persuasion—it's all about creating 'aha' moments with visualizations.

- It's where the Questions are put juxtaposition with the Answers and the 'decision makers' GET IT, know what to do next (or what not to do).

- It is often about Statistical Thinking, providing longitudinal data, portraying it in a way that makes it easy to see patterns, trends, breakdowns, etc.

THE POIRIER GROUP
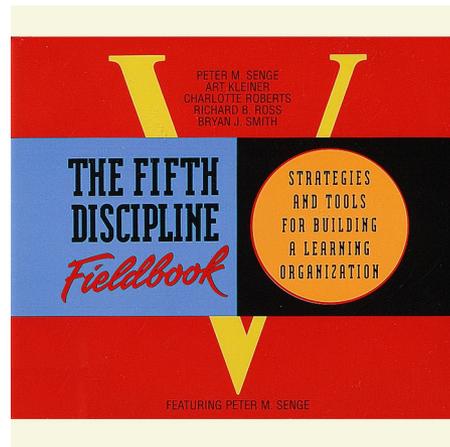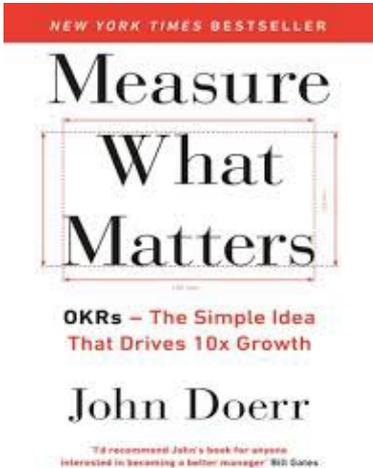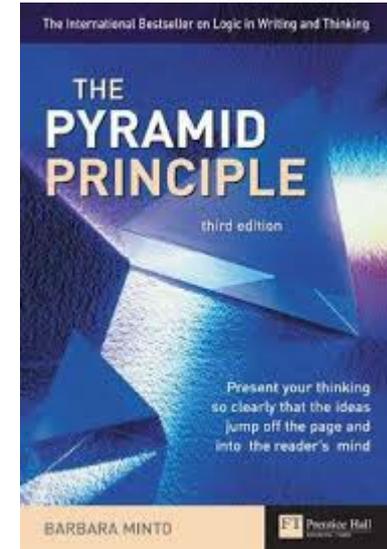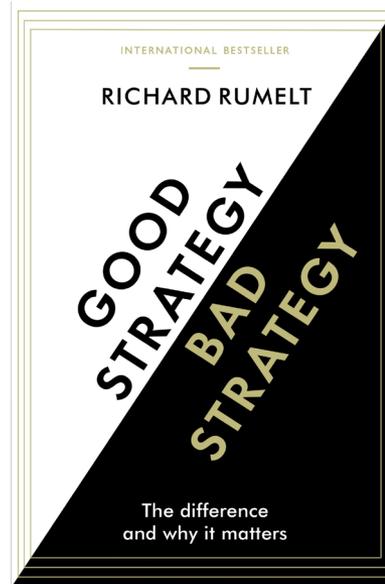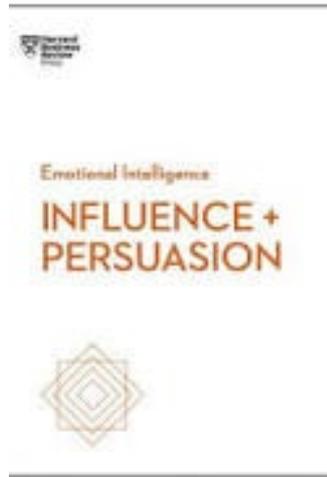
A simple example of the point I'm making

The Question: Are sales improving over time?

Exploratory Data Analysis—Run Chart


Time Series Plot of Sales
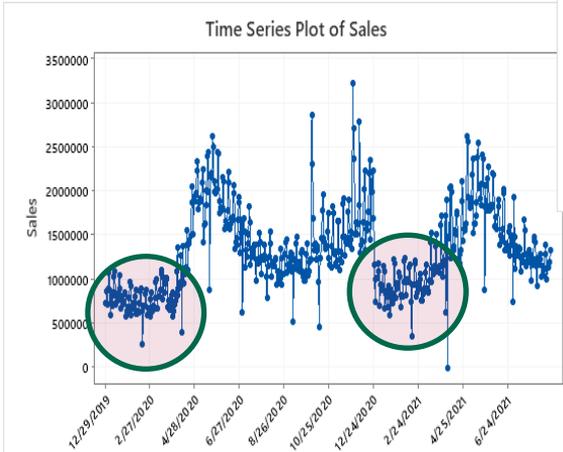
Note—one step we will always be doing is a data validation step, do we have the right data, is the data accurate, etc. This has not been done with this data set yet—illustration at this point

Histogram of Jan 20 - Apr 20, Jan 21-Apr 21
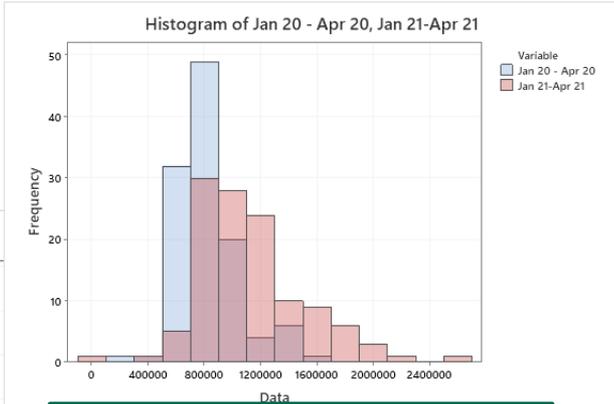
Exploratory Data Analysis—Overlayed Histogram

Confirmatory Data Analysis—Hypothesis Testing for Statistical Significance

2-Sample t Test for the Mean of Jan 20 - Apr and Jan 21-Apr 2
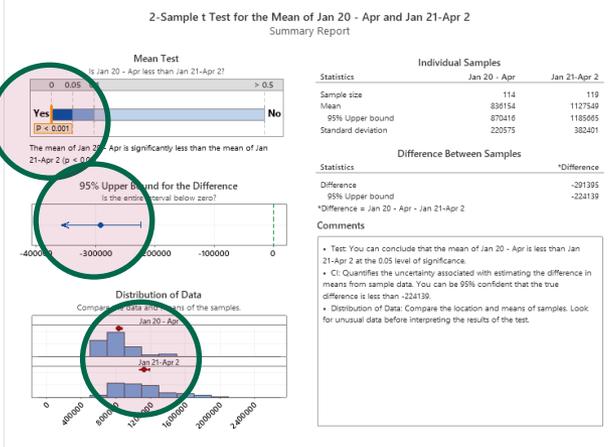
Yes, as one would expect, Jan-Apr 21 is significantly higher than Jan-Apr 20.

We can expect that an Operational Analytics Specialist (top of triangle, user and use case focused) will tailor analytics work like this full time.

Zooming in to filtered tables then gives you a more granular sense of where that came from (only 3 sources: price recovery (margins), increase in # of customers, increase in spend by customers)

Point is: with the right Charts first, then zooming in to the reports/Tables can be more purposeful and less overwhelming. Once again, your OA Specialist will facilitate and support this with your Huddle Teams
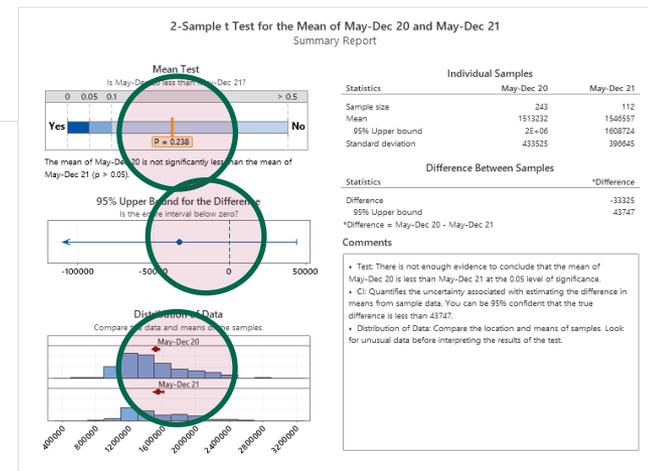
1/1/2020   4/30/2020   Price Type: All   Season: All

Fiscal View

Daily Sales

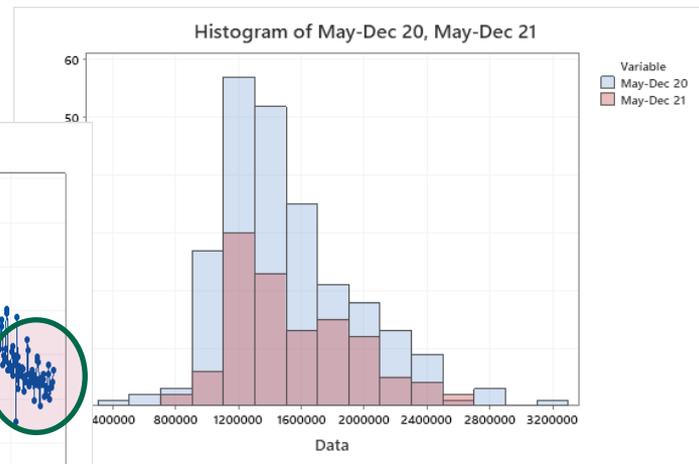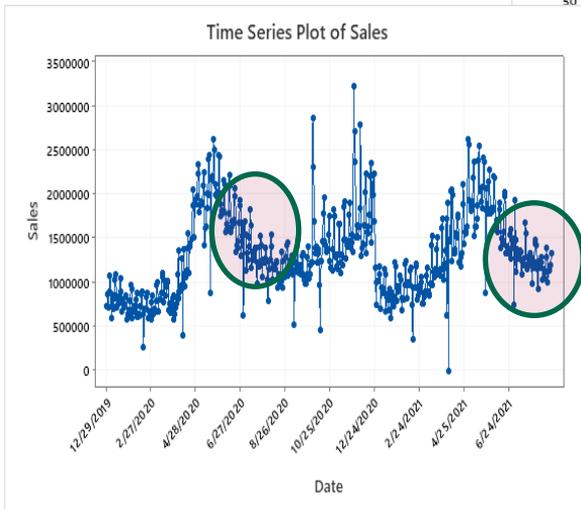| Month	TY Sales	LY Sales	TYvsLY Sales %	LY2 Sales	LYvsLY2 Sales	Total Sales Target	TYvsTarget Sales	TY Margin	LY Margin	TYvsLY Margin %	LY2 Margin	LYvsLY2 Margin	Total Margin Target	TYvsTarget Margin	TY Rate	LY Rate	TYvsLY BPS	LY2 Rate	TY Units	LY U
February	20,362,497	24,217,353	-15.9%		Infinity	24,175,570	-15.8%	6,928,772	7,668,329	-9.6%		Infinity	8,122,544	-14.7%	34.0%	31.7%	236.3		1,359,720	1,58
March	25,201,146	26,584,280	-5.2%		Infinity	28,714,976	-12.2%	8,741,987	8,987,443	-2.7%		Infinity	10,305,770	-15.2%	34.7%	33.8%	88.1		1,770,134	1,79
January	24,157,917	21,872,416	10.4%		Infinity	24,791,649	-2.6%	7,914,353	7,097,679	11.5%		Infinity	8,552,415	-7.5%	32.8%	32.5%	31.1		1,502,929	1,40
April	37,955,435	37,929,893	0.1%		Infinity	43,761,752	-13.3%	15,120,291	13,143,666	15.0%		Infinity	14,831,160	1.9%	39.8%	34.7%	518.4		2,806,772	2,53
Total	107,676,996	110,603,941	-2.6%		Infinity	121,443,946	-11.3%	38,705,403	36,897,118	4.9%		Infinity	41,811,889	-7.4%	35.9%	33.4%	258.6		7,439,555	7,38

1/1/2021   4/30/2021   Price Type: All   Season: All

Fiscal View

Daily Sales

Month	TY Sales	LY Sales	TYvsLY Sales %	LY2 Sales	LYvsLY2 Sales	Total Sales Target	TYvsTarget Sales	TY Margin	LY Margin	TYvsLY Margin %	LY2 Margin	LYvsLY2 Margin	Total Margin Target	TYvsTarget Margin	TY Rate	LY Rate	TYvsLY BPS	LY2 Rate	TY Units
⊞ January	26,906,937	24,936,548	7.9%	22,495,164	10.9%	25,951,719	3.7%	8,650,207	8,028,551	7.7%	7,302,516	9.9%	8,669,201	-0.2%	32.1%	32.2%	-4.7	32.5%	1,710,175
⊞ February	26,498,566	19,992,720	32.5%	24,273,718	-17.6%	24,594,827	7.7%	9,344,817	6,694,587	39.6%	7,672,951	-12.8%	8,321,546	12.3%	35.3%	33.5%	178.0	31.6%	1,691,667
⊞ April	45,818,246	30,956,122	48.0%	40,548,549	-23.7%	39,908,881	14.8%	17,452,930	12,357,469	41.2%	13,662,799	-9.6%	15,213,124	14.7%	38.1%	39.9%	-182.8	33.7%	2,757,464
⊞ March	34,954,593	24,997,081	39.8%	26,868,002	-7.0%	29,615,132	18.0%	13,186,967	8,560,209	54.0%	9,114,995	-6.1%	10,413,440	26.6%	37.7%	34.2%	348.1	33.9%	2,167,151
Total	134,178,343	100,882,471	33.0%	114,185,434	-11.7%	120,070,559	11.7%	48,634,921	35,640,817	36.5%	37,753,262	-5.6%	42,617,311	14.1%	36.2%	35.3%	91.7	33.1%	8,326,456

Then we can look at the other rational subgroup of data—May-Aug

And once again, the comparative filtered tables help us see why we aren't improved over last year from May forward

5/1/2020 8/24/2020

Price Type: All   Season: All

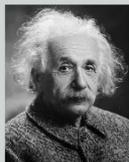**Fiscal View**

Daily Sales

Month	TY Sales	LY Sales	TYvsLY Sales %	LY2 Sales	LYvsLY2 Sales	Total Sales Target	TYvsTarget Sales	TY Margin	LY Margin	TYvsLY Margin %	LY2 Margin	LYvsLY2 Margin	Total Margin Target	TYvsTarget Margin	TY Rate	LY Rate	TYvsLY BPS	LY2 Rate	TY Units	LY
⊞ July	41,217,568	36,241,629	13.7%		Infinity	36,236,176	13.7%	14,191,069	12,312,182	15.3%		Infinity	12,643,701	12.2%	34.4%	34.0%	45.7		2,419,797	2
⊞ August	27,622,987	24,994,726	10.5%		Infinity	24,860,298	11.1%	9,556,580	7,942,714	20.3%		Infinity	8,490,606	12.6%	34.6%	31.8%	281.9		1,725,290	1
⊞ June	52,099,134	42,255,889	23.3%		Infinity	41,098,793	26.8%	19,255,784	14,736,548	30.7%		Infinity	14,939,727	28.9%	37.0%	34.9%	208.5		3,056,760	2
⊞ May	62,945,867	52,448,310	20.0%		Infinity	53,040,141	18.7%	24,114,448	18,050,636	33.6%		Infinity	19,920,290	21.1%	38.3%	34.4%	389.4		4,625,784	4
Total	183,885,556	155,940,555	17.9%		Infinity	155,235,408	18.5%	67,117,880	53,042,080	26.5%		Infinity	55,994,324	19.9%	36.5%	34.0%	248.6		11,827,631	10

5/1/2021 8/24/2021

Price Type: All   Season: All

Fiscal View

Daily Sales

Month	TY Sales	LY Sales	TYvsLY Sales %	LY2 Sales	LYvsLY2 Sales	Total Sales Target	TYvsTarget Sales	TY Margin	LY Margin	TYvsLY Margin %	LY2 Margin	LYvsLY2 Margin	Total Margin Target	TYvsTarget Margin	TY Rate	LY Rate	TYvsLY BPS	LY2 Rate	TY Units
⊞ August	26,610,230	28,383,862	-6.2%	24,711,290	14.9%	28,213,846	-5.7%	9,173,525	9,733,252	-5.8%	7,880,625	23.5%	9,810,511	-6.5%	34.5%	34.3%	18.2	31.9%	1,518,003
⊞ June	48,637,635	54,730,513	-11.1%	41,882,625	30.7%	52,149,901	-6.7%	19,430,975	20,510,766	-5.3%	14,596,341	40.5%	19,682,446	-1.3%	40.0%	37.5%	247.5	34.9%	2,850,517
⊞ July	40,227,248	43,779,810	-8.1%	36,303,855	20.6%	44,106,431	-8.8%	14,639,195	15,159,235	-3.4%	12,274,923	23.5%	15,591,134	-6.1%	36.4%	34.6%	176.5	33.8%	2,243,960
⊞ May	61,048,468	61,605,582	-0.9%	50,355,078	22.3%	59,753,182	2.2%	23,920,991	23,763,145	0.7%	17,734,167	34.0%	22,924,535	4.3%	39.2%	38.6%	61.1	35.2%	4,125,978
Total	176,523,581	188,499,768	-6.4%	153,252,849	23.0%	184,223,361	-4.2%	67,164,686	69,166,398	-2.9%	52,486,056	31.8%	68,008,625	-1.2%	38.0%	36.7%	135.5	34.2%	10,738,458

- What's causing/driving and/or enabling the change in revenue over time?

- # of customers? Share of wallet from our customers, spend? Loyalty, stickiness of relationships? Seasonality, competition, pricing, other positioning factors like 'branding', location, ordering experience, etc.

- Right now you've got 'ad hoc' analytics work going on which is diffusing your BI resources.   Not a bad thing, just inefficient. A single, really solid OA Specialist can be leveraged to do more systematic analytics focused on root causes.

- We want to teach people how to focus on Fixing the Process not just Fixing the Problem.

3

"PEEL BACK THE LAYERS OF THE ONION"

Investigate a situation systematically in order to identify deep-lying issues

In conversation:
"We need to peel back the layers of the onion on this one."

"Insanity: doing the same thing over and over again and expecting different results."

Albert Einstein

"If you can't describe what you are doing as a process, you don't know what you're doing."

W. Edwards Deming

Metrics captured within the Site-Based Dashboard

Optimizing Accessibility

How to Build Better 'Dials' on your 'Dashboards' and 'Scorecards
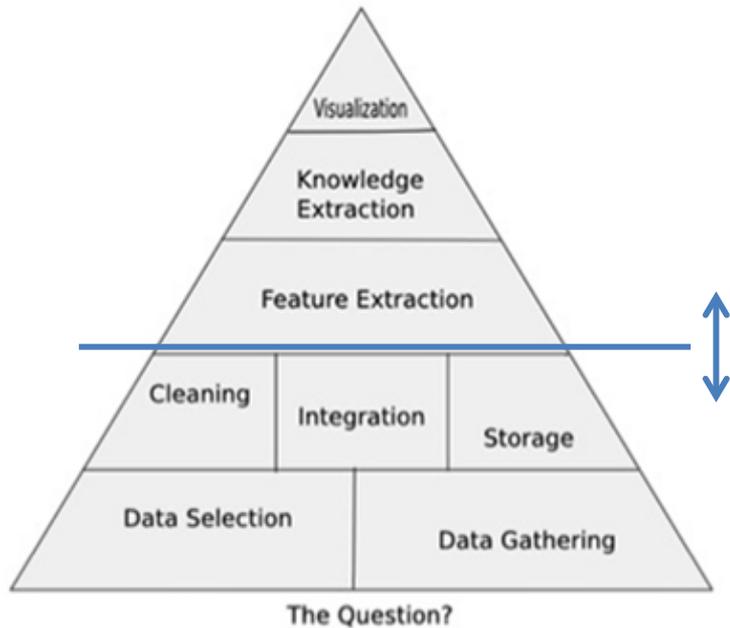
The Question?

Key Points to Consider:

Good analytics come from good context understanding, use case clarity, *good problem/opportunity statements*, clear understanding of DONE, they specify 'the questions'

Investment in the data foundation has a positive ROI, as analysts and users move faster when they trust the data – results in faster results

Good data visualizations can tell the right story quickly, because people are predisposed to believe what they see in a chart …

Good Operational Analytics *provokes more timely decisions and actions* – indeed, in most organizational systems, simple and persuasive/influential beats complex/ambiguous every time

Good Operational Analytics *provokes more timely decisions and actions* – indeed, in most organizational systems, simple and persuasive/influential beats complex/ambiguous every time
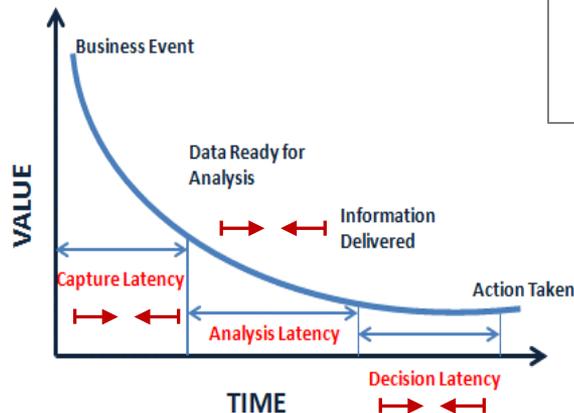
TPG can help your organization speed things up and achieve Better Benefits Faster. Contact us.

Logic for the Mini-Series and the Certification Program (DCDOV)

OA 101: DEFINE--Foundations for Building Performance Measurement, Evaluation, Improvement Systems

OA 201: CONCEPT DESIGN—The Data Management and Analyst Roles and Methodology

OA 301: DETAILED DESIGN AND DEVELOPMENT—Developing Visible Measurement and Management Systems that 'catalyze' knowing what to improve and how things are improving over time.

- Defining 'Visibility', The Power of Visible Measurement, How they support "Good Strategy"
- Building Scorecards and Dashboards
- Deploying them into Tiered Huddle Systems (as example)

- **OA 401: BEST PRACTICES (Case Studies)**
  - University Health Network, Toronto, Chief Data and Analytics Officer

- **OA 501 and 601 (on drawing board)**
  - Advanced Tools to support best in class Operational Analytics

How can you do this really fast?
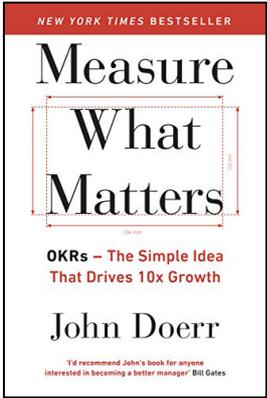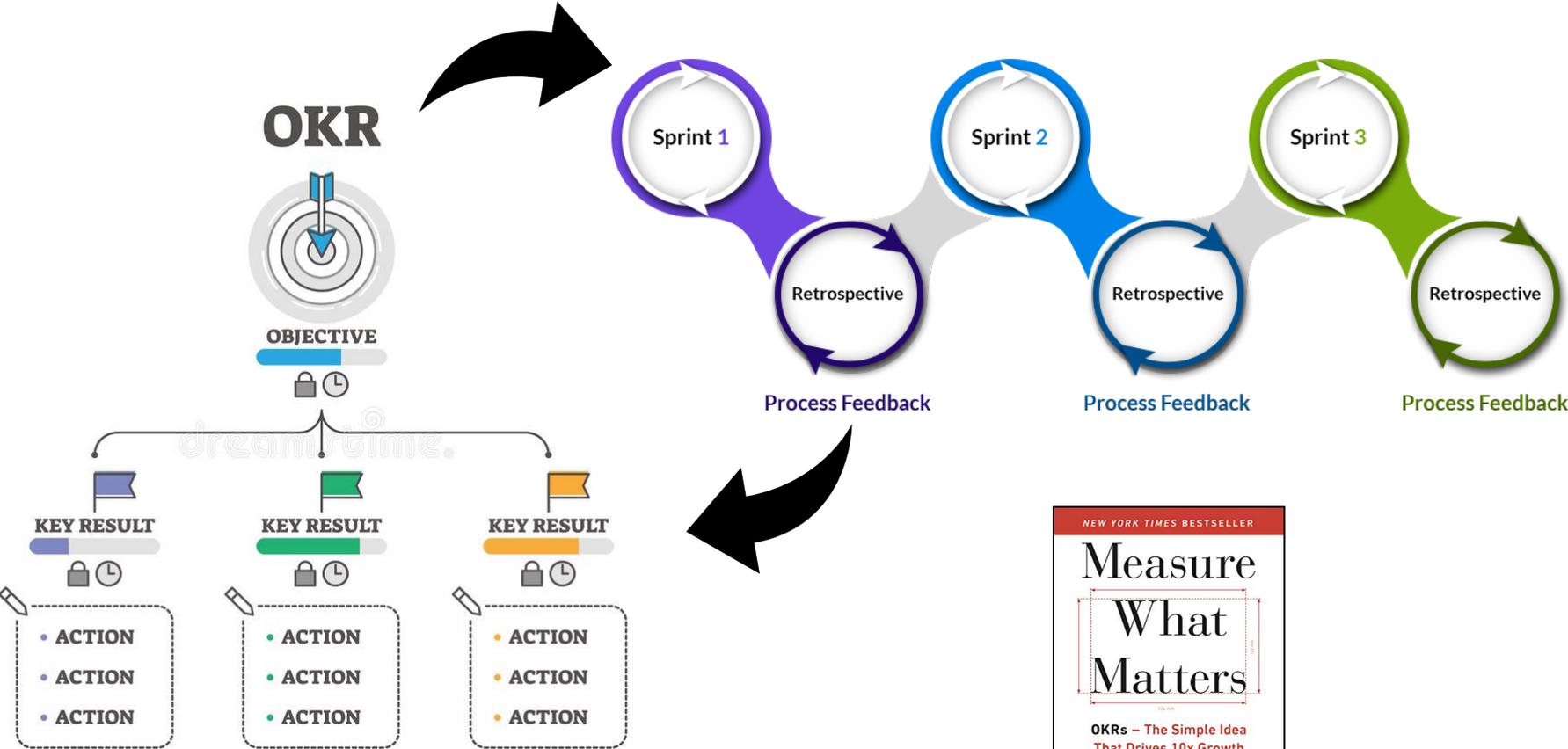
Design for… approach to Management Systems Engineering

Define

Concept Design

Detailed Design & Development

Optimize

Verify
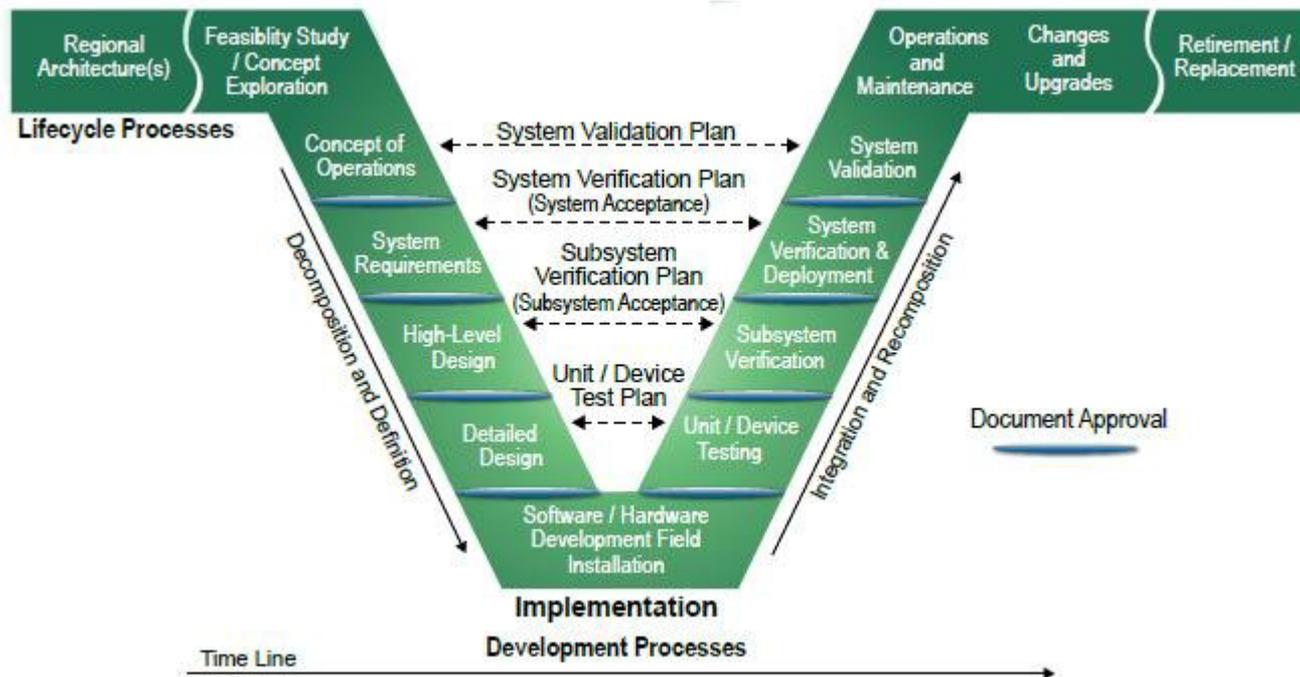
What are the components of the 'Management System' ('B')

Visible Measurement Systems (Knowledge of Results, **Accountability)**

Scorecards, Dashboards, Chartbooks (PowerBI)

Alignment top to bottom, front to back (e.g. Hoshin Kanri)

Agile Huddles & Retrospectives (Sharepoint)

Tiered PDSA Huddles (Communication & Coordination)

Knowledge of Results, Growth Needs, Engagement

Augmented Processes with Tech Enab. (quality & speed)

Job Enrichment (augment, enable people for them to do higher order tasks and innovate)

Measurement, Evaluation, Analytics Systems

Planning System

Communication and Coordination

'B' System

Deployment Process

Motivation— Ideal Behavior Assurance

'Technology' Enablement— includes Process design

Design for… approach to Management Systems Engineering

Define   **C**oncept Design   **D**etailed Design & Development   **O**ptimize   **V**erify

101
- Strategic Context
- Key Stakeholder Analysis
- Management System Model
- Management System Analysis
- Value Stream Mapping and Analytics
- MSM Interface Requirements Definition
- Control Point Metrics and Spec Limit determination

201
- BPI capability and capacity
- Enterprise level Value Stream Mapping and Modeling (Enterprise Value Map)
- BPI Portfolio Strategy and Development
- Tiered Scorecard and Dashboard and Chartbook Concept Development
- Visible Measurement System
- Tiered Huddle System (as example)

301
- BPI capability and capacity
- Enterprise level Value Stream Mapping and Modeling (Enterprise Value Map)
- BPI Portfolio Strategy and Development
- Tiered Scorecard and Dashboard and Chartbook Concept Development
- Visible Measurement System
- Tiered Huddle System (as example)

401
- Measuring what matters
- Data and Fact Driven Organization
- Enterprise Value growing at best in class rates
- B continually driving out 'C' and 'D'
- **Focused** innovation and improvement
- **Alignment** and **coordination** top to bottom, back to front
- **Discipline** with 'A' and 'B'
- Accountability, Trust, Culture
- Information (Profound Knowledge) and Insights and Bias for Action and Results

UHN's Data & Analytics Strategy

Building UHN's ability to see, understand and use its data to advance patient care, education and research

- Data-driven decision making enabled across UHN
- Liberated data assets for patient care, discovery and learning
- Policies built to support and enable strategic pursuits

Drive the convergence of care, research and education.

- Strategically aligned enterprise data architecture
- Standardized datasets and data management
- Protect and unlock data through balanced infrastructure investment

Unleash the power of technology and innovation.

- Improved data literacy across UHN (UHN community at large)
- Transparency through data in all that we do
- Liberated capacity by balancing human-machine automation

Empower and invest in a diverse TeamUHN.

- Empowered Leadership using analytics to drive novel care models
- Supported insight and decision making through predictive analytics
- Empowered staff building innovative solutions using data

Inspire, invent and deliver tomorrow's care.

- Established partnerships supporting learning and development
- Enabled ethical public-private collaboration in the use of data and insight

Elevate Canada as a world destination for commercialization and discovery.

What is a data-driven organization?

Data Supply Drivers		Data Demand Drivers

Rich Data Sources
• Electronic Health Records • Health Information Exchange (HIE) • Genomic Information Systems • BioRepositories • Benchmarking •

Continuous Data Streams
• Wearable body sensors • Implantable systems • Point of care testing • smart sensors/bandages • nanotechnology •

Patient Generated
• Personal health applications (apps) • Patient portals • CRM • Patient engagement portfolios •

Web and Social media
• Online communities • Public forums •

Smart Machines
• Internet of things • Intelligent processors • Machine to machine • Robotics •

Performance Operations
• Workflow • Time stamps • Effort • Investment •

A Healthcare organization that is data-driven

Imbed Data in every decision, interaction & process

Quality data
Stewardship
Integrated across care continuum
Use, Access & Sharing
Data Literacy

Personalized healthcare
• Shared decision making • Personal ownership of health record • Engagement & persuasion hub •

Non-traditional care environments
• Reduced hospitalization • Video/tele health • Virtual and augmented reality •

Predictive medicine & AI enabled care
• Shift from restrictive gatekeeper to coordinator • Rapid diagnosis and treatment • Predictive modelling • Learning health system •

Population health
• Patient stratification • Disease prevention and health promotion • Chronic diseases • Value-based care delivery models •

Efficiency & Optimization
• Patient flow • Delivery • Efficiency • Cost •

Michael Caesar, Chief Data & Analytics Officer, UHN, 2017

Data & Analytics

And, Just Ahead…..

June and July Offerings for you..

An Analytics Mini-Series:

- *14 July—(401) Best Practice Case Study—Data and Analytics at University Health Network, Toronto*
    - *(OA 401) Register for Best Practices in Analytics UHN Toronto*
- *18 July—Operational Analytics 301*
    - *Register for Operational Analytics 301*

Capstoned by a Feature Article in the ISE Magazine in August.

August & September Sneak Preview

- *An 'AI' Miniseries*
- *Our Annual Final Four Capstone Senior Design Presentations*

Certificates and Certifications

- Stick with the Series and earn an OA Certificate with CEU's from IISE.

- Consider IISE's Operational Analytics Certification.

    - An on-demand course that takes this Series a level deeper, works on skill development.
    - Essentially a 4 ch level, Semester Course in OA.
    - Tailoring and coaching encouraged and provided.

    - For more on this, please contact James Swisher jswisher@iise.org

Context – reading list provided from Intel Global SCM Analytics team member (Moneyball is a great movie if you haven't seen)
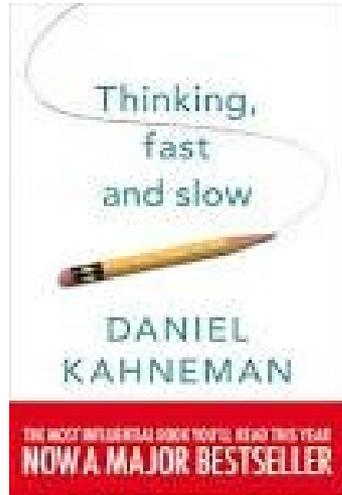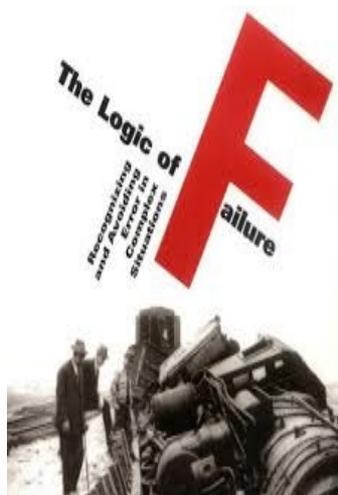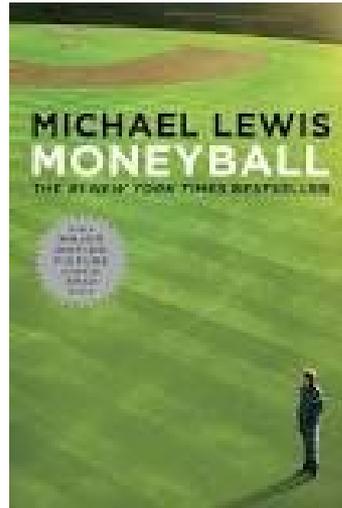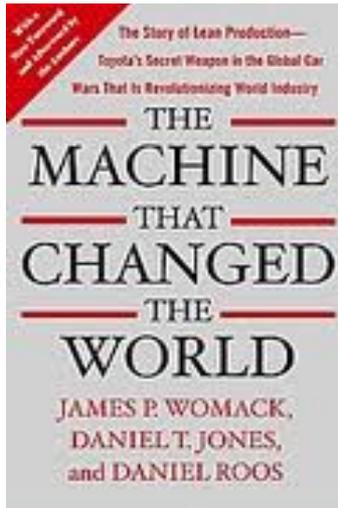
- Journey from craft to volume

- Profit from fixing inefficiencies

- Understand why things fail

- Recognize human biases

INSTITUTE OF INDUSTRIAL & SYSTEMS ENGINEERS

MIT MANAGEMENT EXECUTIVE EDUCATION

Northwestern | McCORMICK SCHOOL OF ENGINEERING

Master of Science in Analytics

OVERVIEW | CURRICULUM | ADMISSIONS | PEO

MSiA Recognized as a Top Six Data Science Program

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Applied Business Analytics
Decision-making with data

IISE | Training Center

120 hours ++, $400 students + $250 for certification
$475/675 member/non-member + $550 for the certification

4 days to 6 mos. $600-$5,000

1-2 yrs, $50-100k

Time/ Cost

On-Line, Virtual

Hybrid/ Blended Model

On campus or Hybrid MS Programs

https://careerfoundry.com/en/blog/data-analytics/best-data-analytics-certification-programs/

In Partnership with:

> The Poirier Group
> Moresteam University

Delivered Uniquely:

IISE Digital Op Ex 'Mall and Stores'

- o **10+ Video Modules for easy, self-paced consumption/learning**
- o **'Chat' Support with Coaches**
- o **Periodic Huddles for virtual coaching**
- o **Certificate requires an on-line final exam**
- o **Certification requires the Certificate plus a reduction to practice, proof of skill project**

Module 1: OA Thought Leader Perspectives

Module 2: Operational Analytics Perspectives, Points of View and Foundational Principles and Methods and Models

Module 3: Operational Analytics: The Foundational Data Management Role

Module 4: Operational Analytics: The Analyst, Decision/Action Support Role

Module 5: Data Sciences and The New Industrial and Systems Engineering

Module 6: Operational Analytics: The Evaluation Role

Module 7: Operational Analytics—Visual Measurement/Management Systems (Parts I, II, III)

Module 8: Operational Analytics: Putting it All Together: Case Studies

Module 9: The Role of Data and Information (Engineered Management Systems) in Periods of Major Disruption, Reducing the Latencies

Module 10: Creating Cultures that Support Full Potential Performance/Operational Excellence

10 fundamental modules make up the certificate program.

On-demand Learning Management System.

Chat Coaching and periodic 'huddle' coaching included.

Approximately 120 hours of studying designed to be completed in 6 months or less.

1. **Op Analytics Certificate and Certification Program Overview**
   Module

2. **Op Analytics: Perspectives and Overview**
   Module

3. **Op Analytics: Data Management Role**
   Module

4. **Op Analytics: Analyst Role**
   Module

5. **Data Scientist Role**
   Module

6. **Op Analytics: Process Improvement (Moresteam)**
   Module

7. **Op Analytics: Visual Measurement (Management) Systems**
   Module

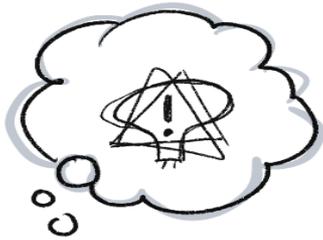8. **Op Analytics: Management Systems Engineering Role**
   Module
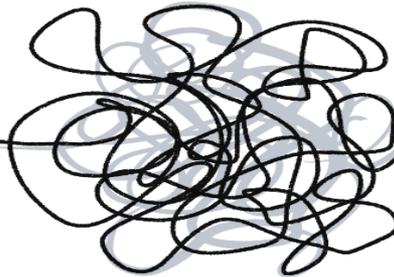
9. **Op Analytics: Case Studies**
   Module

10. **Op Analytics: Data Sets and Skill Development Practice/Exercises**
    Module

Operational Analytics—Opportunity Framing

Vague, poorly formed idea of the problem, no 'good' diagnosis, hence no 'good' strategy

COMPLEXITY!

Clear, Succinct Problem Statement, Vision, Strategic Pathway, Migration Plan

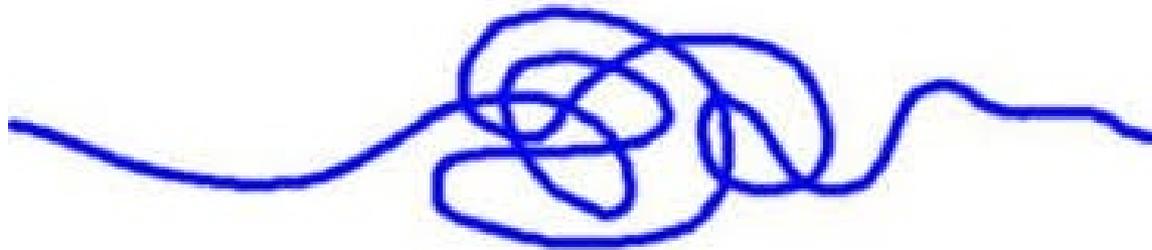|		
We should be measuring more…	Measure what matters!!	There is a logical strategy path, roadmap, migration plan to follow to build tiered visible measurement systems in our organization.
We're data rich and information poor	Balanced Scorecards	
We're data poor	KPI's	
Measurement matters	Analytics	Learn the strategy path and follow it.
Jump on the Analytics bandwagon	Big Data	
Improve Accountability	ERP's	Good Strategy vs Bad Strategy….
	Power BI, Tableau, ChatGPT, AI…….	

Operational Analytics—Opportunity Framing

Beginning   Muddle   End

Avoid the Muddle!

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You can't do 'good' Analytics work and not be a good Systems Thinker
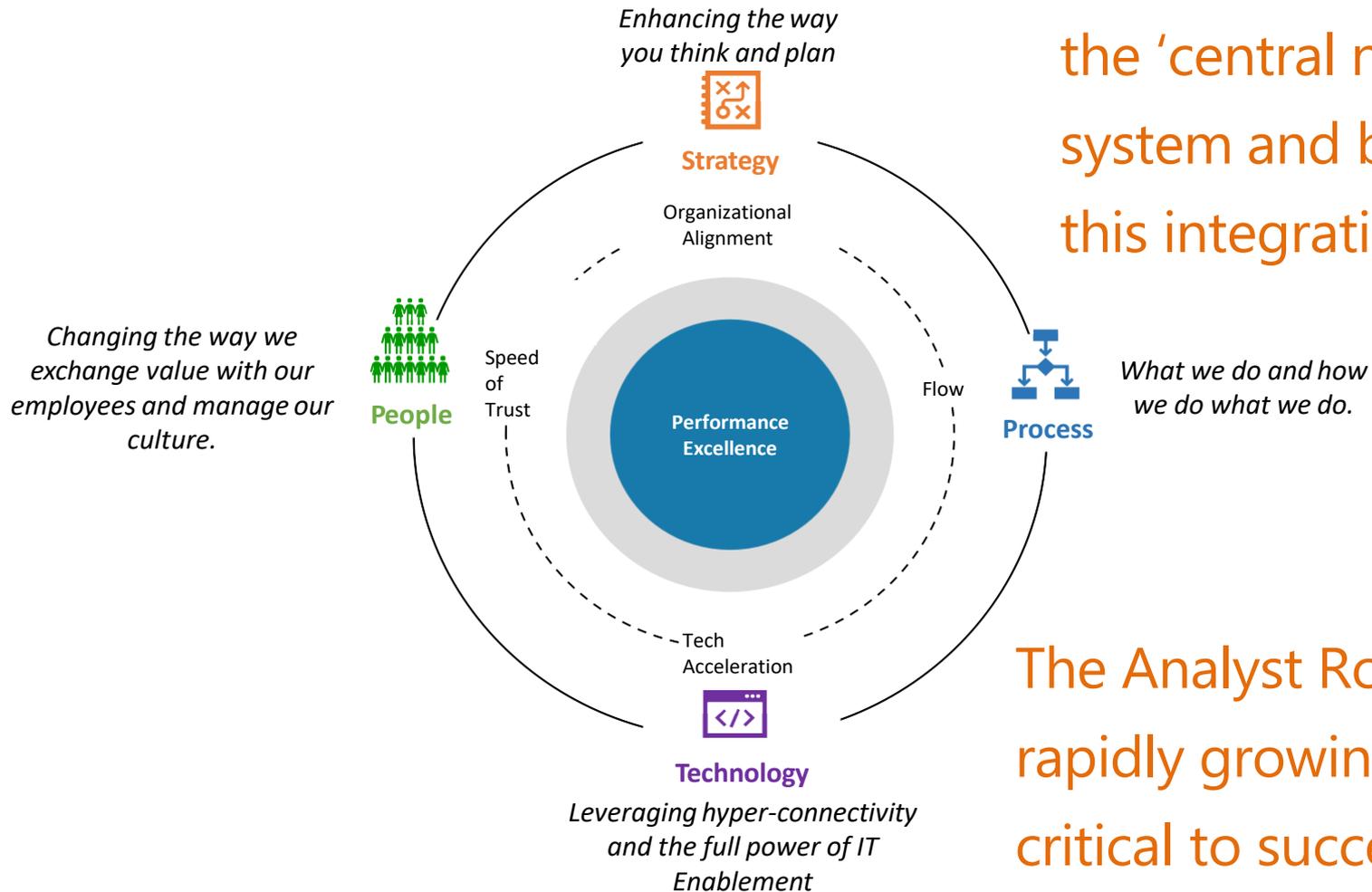
ISE's Create Value by Integrating People, Strategy, Process and Technology

Operational Analytics is the 'central nervous system and brain' behind this integration

Enhancing the way you think and plan

Strategy

Organizational Alignment

Changing the way we exchange value with our employees and manage our culture.

People

Speed of Trust

Performance Excellence

Flow

Process

What we do and how we do what we do.

Tech Acceleration

Technology

Leveraging hyper-connectivity and the full power of IT Enablement

The Analyst Role is a rapidly growing and critical to success function in Op Excellence.

4

Operational Analytics Begins with the End in Mind
End Game: **Grow Enterprise Value**
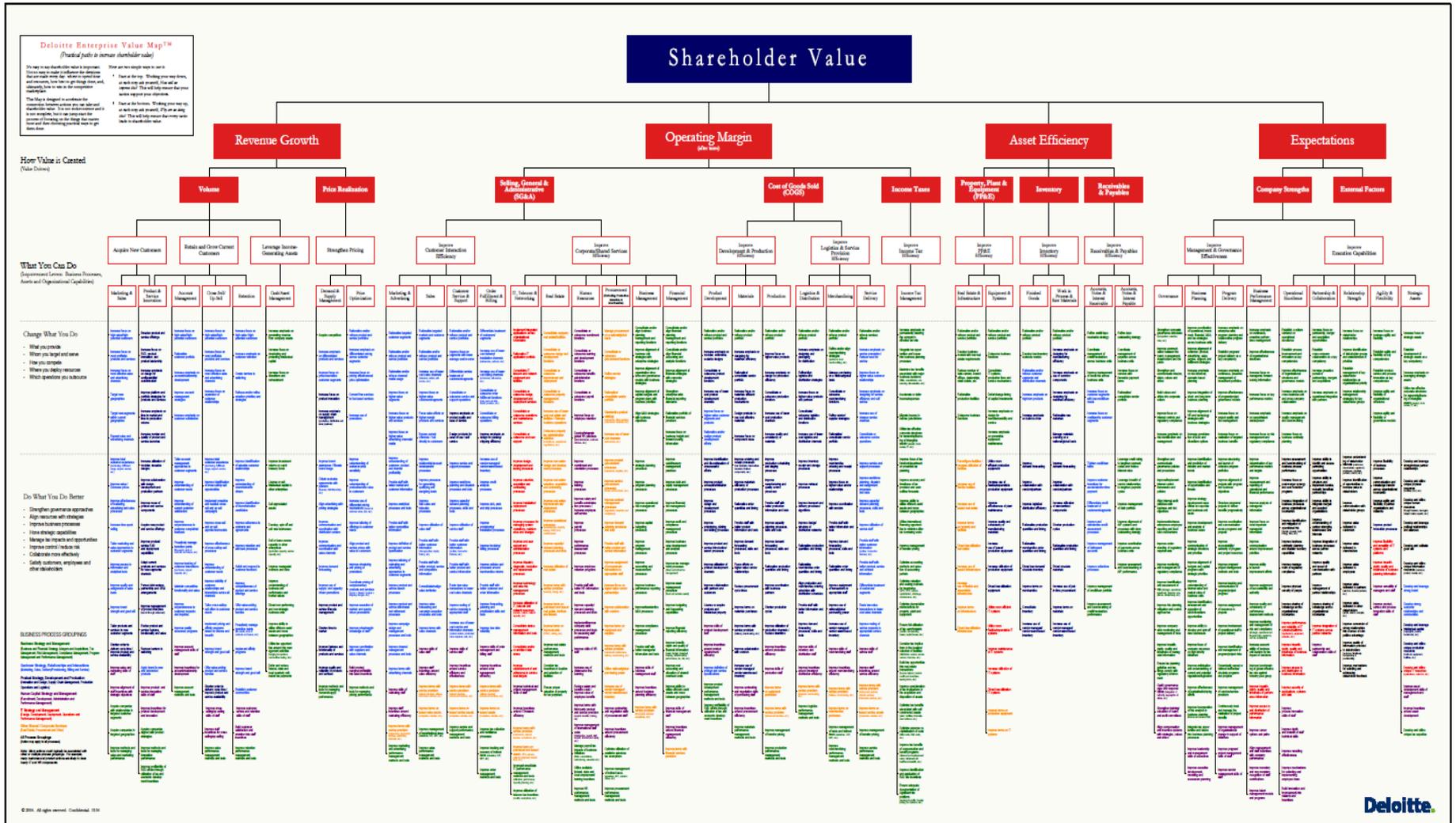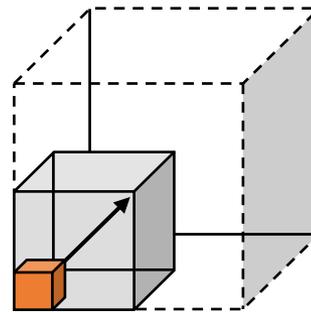
END GAME: Grow Enterprise Value

POSITIONING STRATEGY

VALUE EXCHANGE OPTIMIZATION

OPERATIONAL EXCELLENCE

25x

10x

1x

+

+
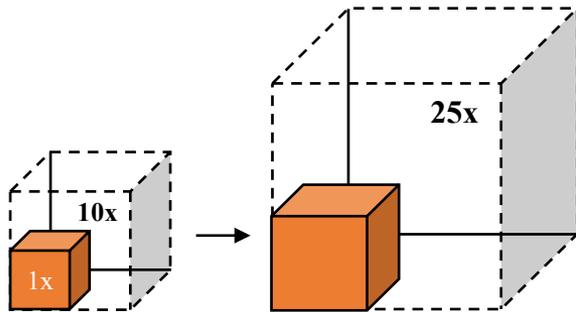
Improve Positioning via..

Managing the Exchange of Value With Stakeholders

Improve Quality, Efficiency, Productivity, Innovation, Engagement, Quality of Work life, Sustainability

Geographic Coverage / Offerings Provided / Served Segments / Branding/ Imaging, etc.

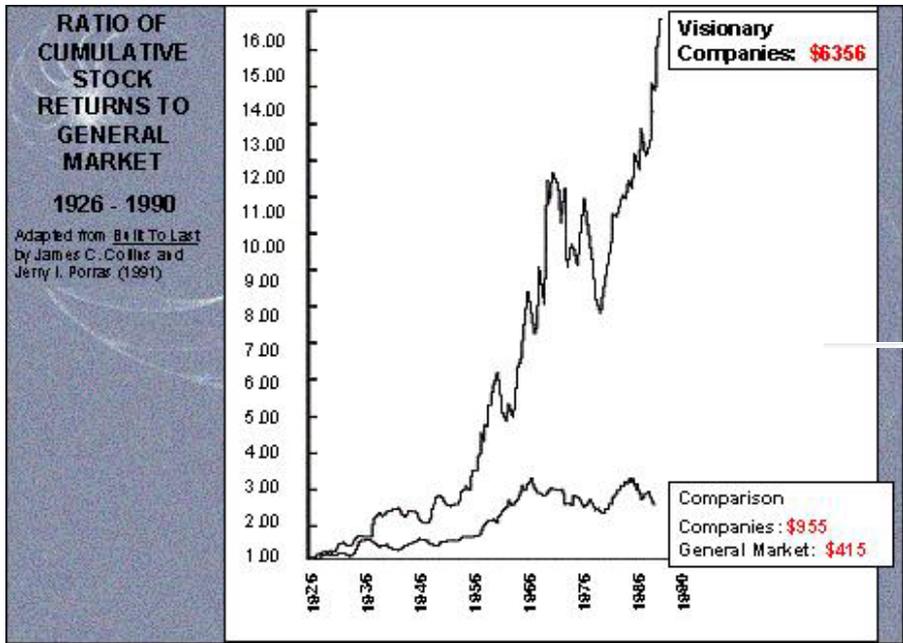**Altering the Give/Get, Responding to unmet and unfulfilled needs, QFD, Innovation, Rebalancing Segment Investment**

Apply principles and methods of ISE and ILSS

The Domain of ISE and Operational Analytics is very broad today

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Succeeding at Operational Excellence and Analytics—why it's a big deal

RATIO OF CUMULATIVE STOCK RETURNS TO GENERAL MARKET 1926 - 1990

Adapted from Built To Last by James C. Collins and Jerry I. Porras (1991)

Visionary Companies: $6356

Comparison Companies: $955
General Market: $415

Built to Last Data

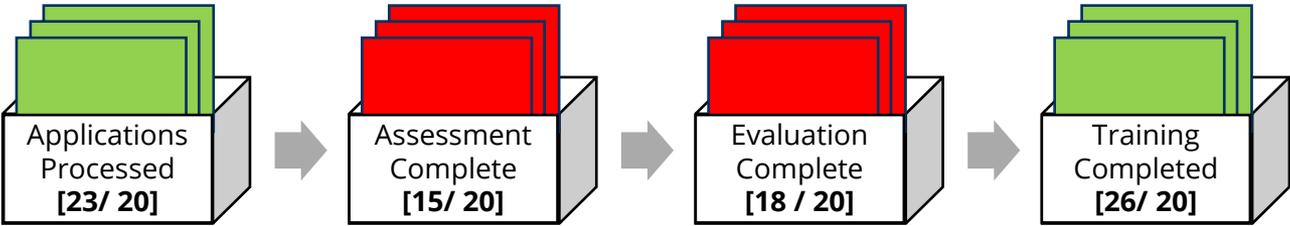A Transformation that Dave played an integral role in...

$60

$6

Logic for the OA Foundations

OA 101: Foundations for Building Performance Measurement, Evaluation, Improvement Systems
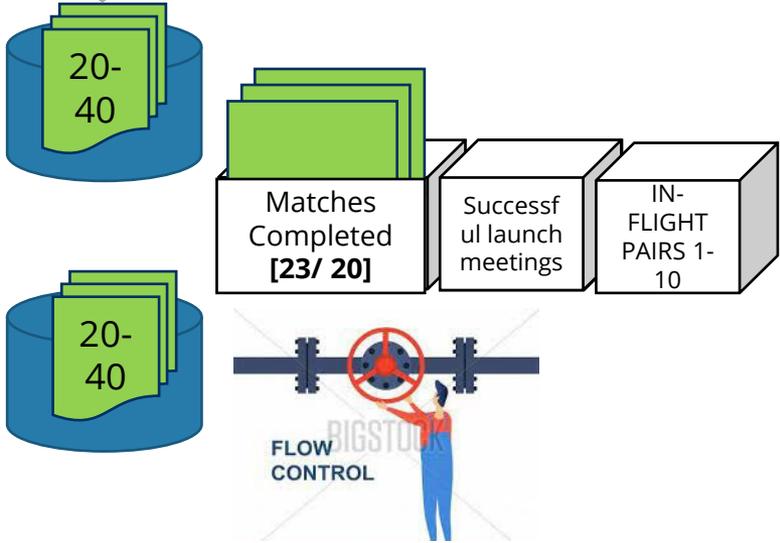
- Systems Thinking and Process Breakdown Structure

- The 'Management Systems Model' (Management Systems Engineering)
    - Management Systems Analysis (Value Streams and Control Points)
    - Users and Use Cases
    - Decision-Action (Study/Adjust) Requirements
    - Information Requirements & Portrayal, Perception, Insights to Actions
    - Data Requirements
    - Data Management Requirements
    - Data Analytics Requirements
    - Visualization Requirements

- Getting all the System Components in Place to ensure 'End Game' Achieved
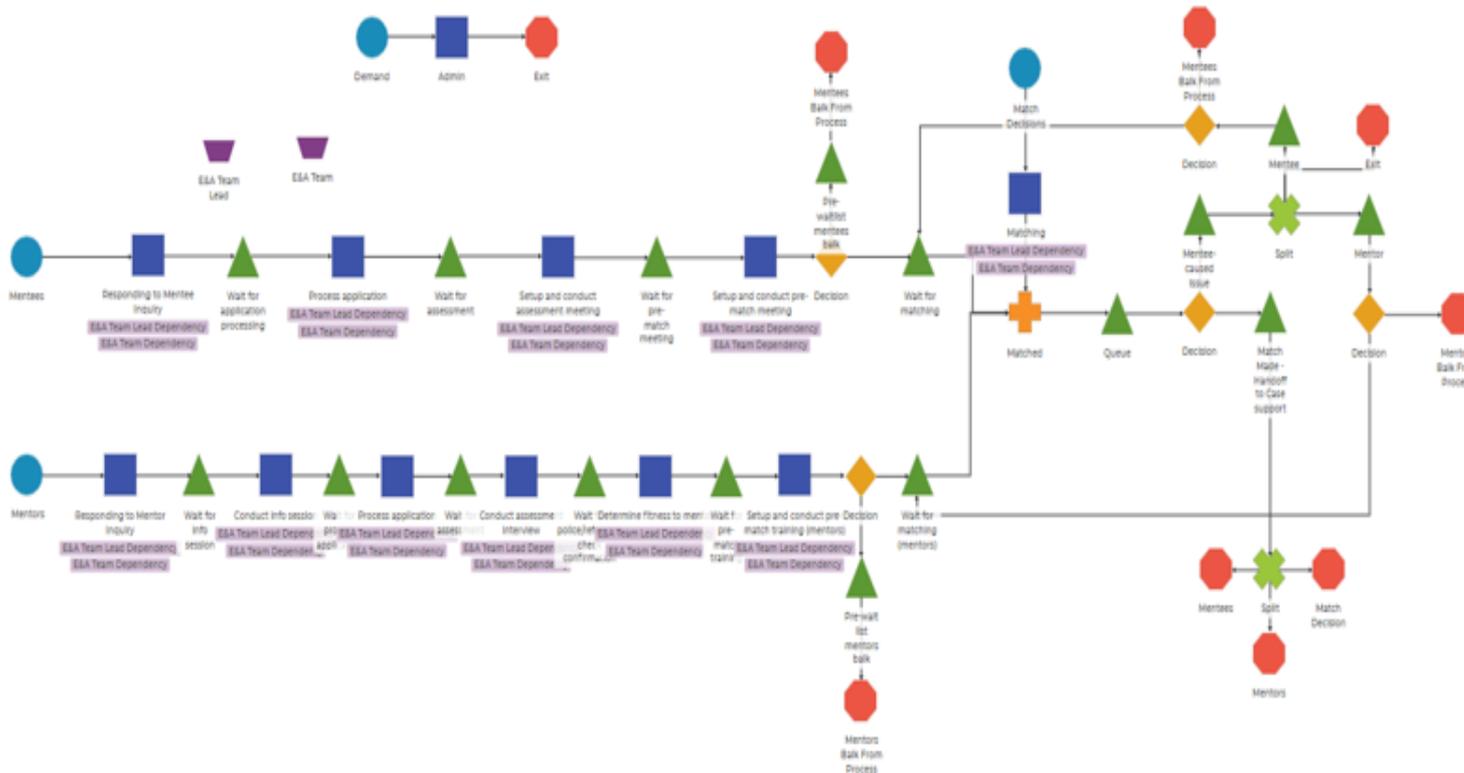
Mentor Application Kanban

| Applications Processed **[23/ 20]** | → | Assessment Complete **[15/ 20]** | → | Evaluation Complete **[18 / 20]** | → | Training Completed **[26/ 20]** |

Shape Demand

20-40

Mentee Application Kanban

| Applications Processed **[31/ 20]** | → | Assessment Complete **[12/ 20]** | → | Training Completed **[24/ 20]** [27 / 50] | → |

20-40

Matches Completed **[23/ 20]**

Successful launch meetings

IN-FLIGHT PAIRS 1-10

FLOW CONTROL

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Big Brothers Big Sisters OF TORONTO

Enrollment & Assessment Team

TPG utilized (compliments of Moresteam) Process Playground to create a simulation model for the front end and back-end of the Value Stream.

The model is in validation stages but just doing this significantly improved our ability to understand the system (more than just doing a value stream map).

We will be using the model to confirm our engineered forecasts of solution element impact on LT and Capacity.

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Big Brothers Big Sisters OF TORONTO

Enterprise Value Creation for BBBST

- By helping them 'Learn to See and Understand' with simple value stream maps, the cross-functional team understood where the 'constraints' were.

- By introducing the concept of 'flow' and getting the 'buffers' (good thing) and 'bottlenecks' (bad thing) right, adjusted properly they increased the 'Primary Y', Served Mentees, by 30% with no additional staffing, all caused by process improvement and a Visible Measurement System and Huddles and some great leadership.
  - Lead time to a 'match' and initial meeting came down from 24 months to under 12 and is still improving. (target is 4 months)

- Not an overly complex system but the principles, methods, and tools were verified and are an example I think you all can relate to.

Need to understand…

- Who are the key players
    - Executive Sponsors
    - Value Stream Owner
    - Process Owners
- What are the R2A2s (roles, responsibilities, accountabilities, authorities)?
- What are the 'teams' and individuals on the 'team' information requirements (what they need/want to know, how they prefer to see 'information').
    - What's holding them back from making more timely, better adjustments that will improve performance, continue to drive system and process, value streams towards more optimal levels of performance.
    - What would they like to know that they don't know, what questions would they like to have answered better, easier, faster?
    - What they articulate, are conscious about AND also what you, as an ISE know they need to know to optimize flow, performance, reduce waste, etc. Benchmarking can help!!!
- What's the 'strategy', what is the future state and what's the migration plan and then how do we measure what matters!!!
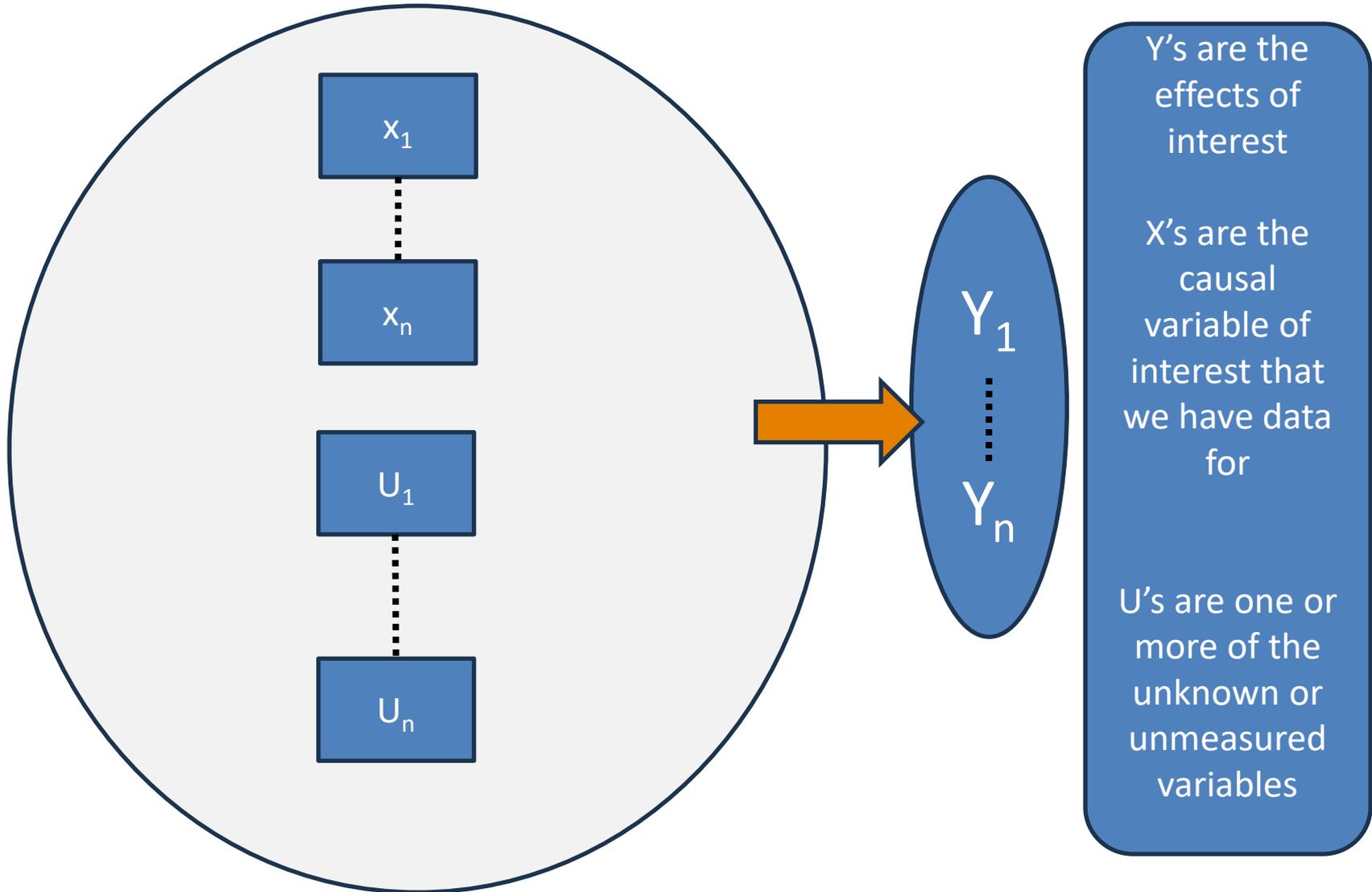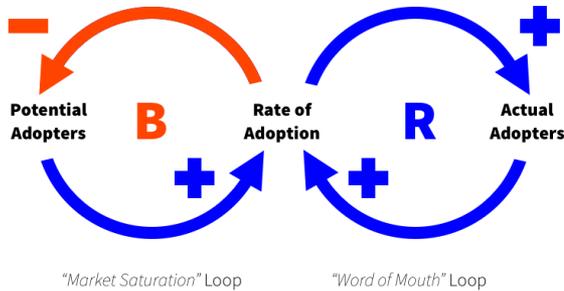
Figure 7
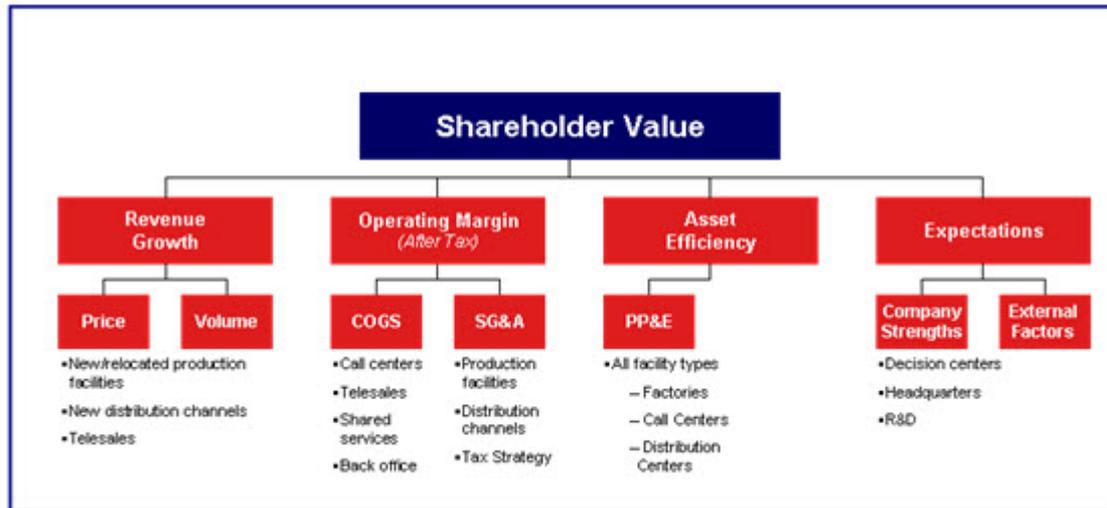
DuPont Model
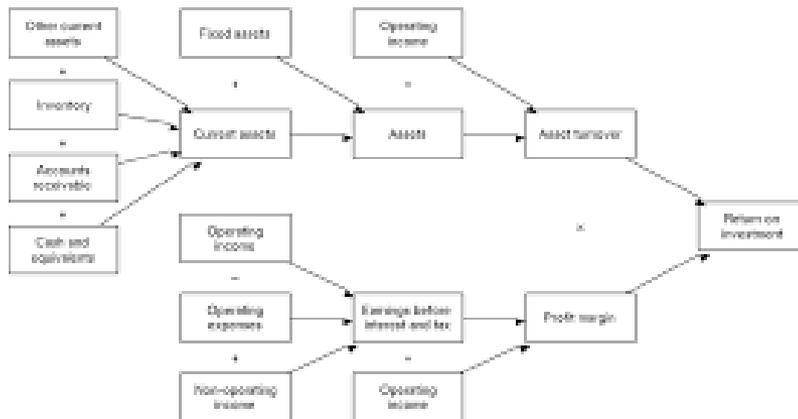
Methods and Tools

- 'ERP' with PowerBI sitting 'on top' with Banks of Scorecards & Dashboards sitting in Sharepoint with Tiered Huddles that engage for PDSA
- Chartbooks by 'unit' with periodic reviews of performance against 'spec limits'
- Chart owners to ensure 'dial's' on instrument panels/banks are sustained, fresh, high quality, creating insights and supporting decisions-actions-adjustments.
- Control Point Scorecards/Dashboards—a control point is a spot in the process where we do or should capture data and we do or should make adjustments to how we manage things at that spot. Creating visibility for Control Point performance is a great way to apply analytics.

- ## What are some of the things you are doing?

The Simplest Causal Model—your data model essentially

x_1

x_n

U_1

U_n

Y_1

Y_n

Y's are the effects of interest

X's are the causal variable of interest that we have data for

U's are one or more of the unknown or unmeasured variables

Y = function (X)

"Market Saturation" Loop   "Word of Mouth" Loop

The Value of Signal (and the Cost of Noise)

The New Economics of Meaning-Making

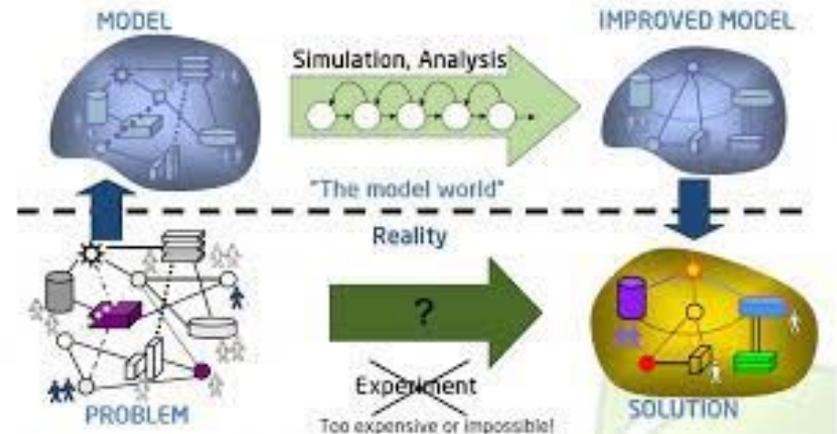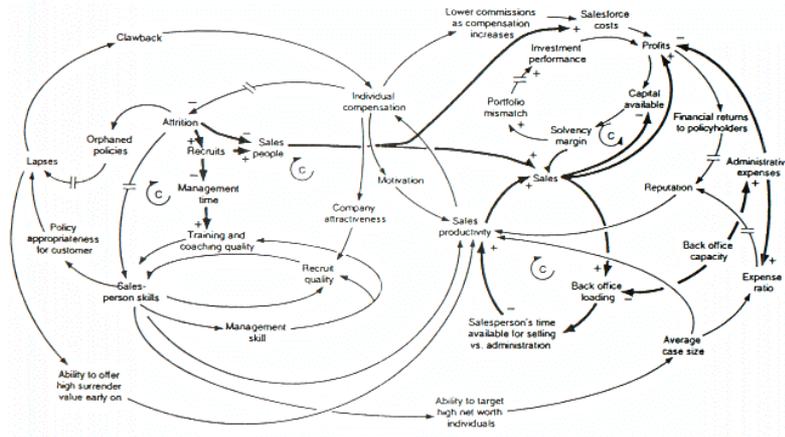EVERY DAY WE CREATE 2.5 exabytes of data[1]

Equivalent to 125,000 years' worth of DVD-quality video.[2]

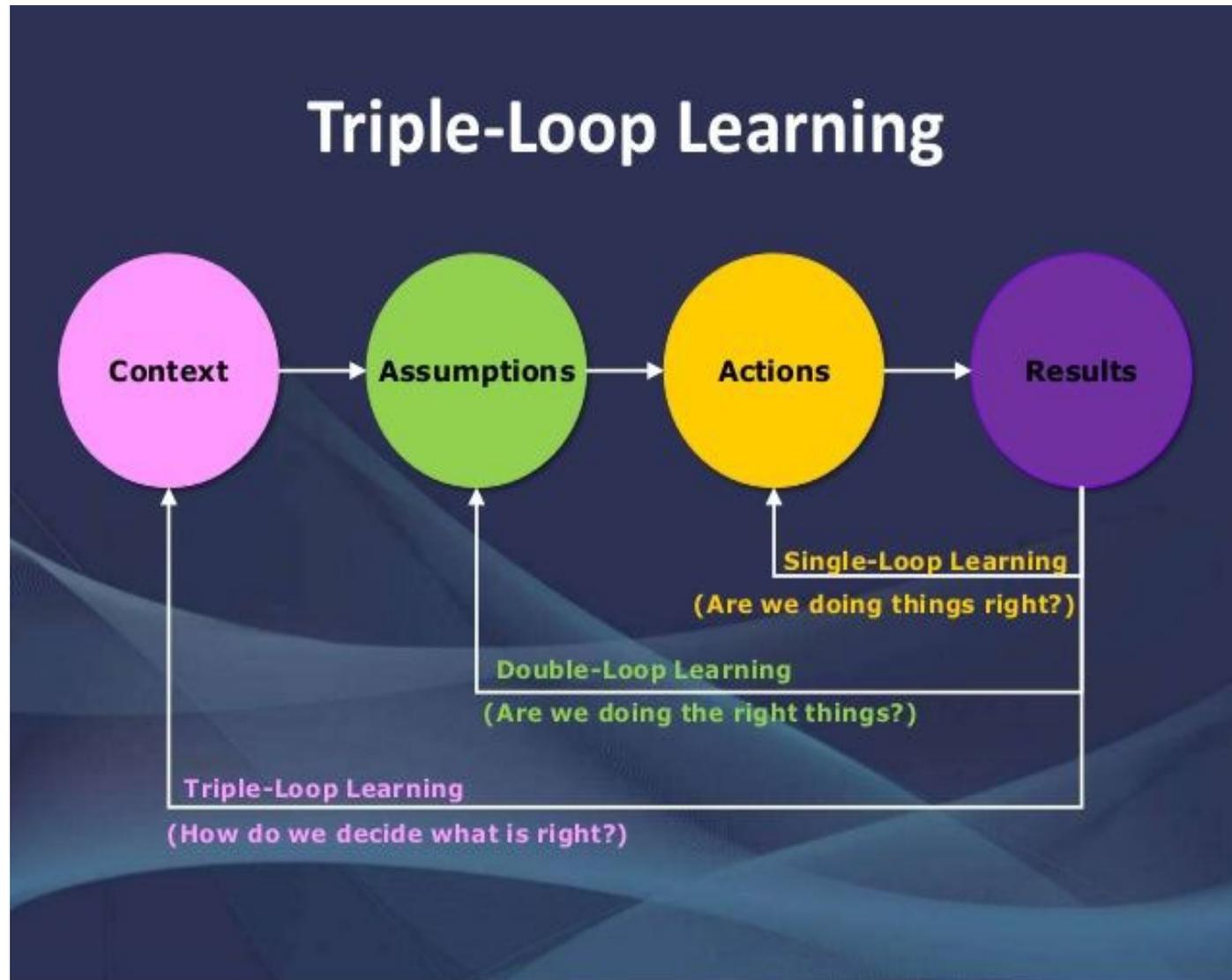90% of the world's data was created in the last two years.[3]

CONTEXT

Is data the new oil?[4]
Organizations that can separate signal from noise are already winning in the market.

SMAC: A $360 billion market by 2016[5]

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Another take on Systems Thinking.

Sometimes organizations and individuals need help integrating Triple and Double loop learning with Good PDSA (are we doing things right?)
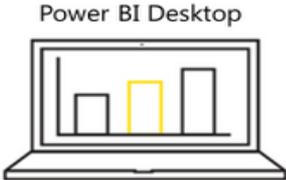

Triple-Loop Learning

Context → Assumptions → Actions → Results

Single-Loop Learning
(Are we doing things right?)

Double-Loop Learning
(Are we doing the right things?)

Triple-Loop Learning
(How do we decide what is right?)

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Example of data integration—hard work but rewards are worth it
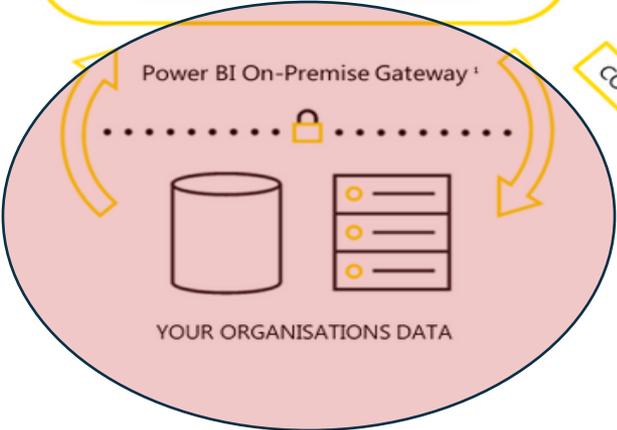
Top 10 Key business benefits of using
Power BI

Uncover actionable insights — 10	1 — Superior accessibility
No upfront costs — 9	2 — Embeddable attributes
Data refresh — 8	3 — Rich features
Continuous updates — 7	4 — Drag-and-drop functionality
Meaningful reports — 6	5 — Powerful connectivity

Power BI Report Server

Power BI Report Server

Report Author

Power BI Desktop (Report Server)

Web Portal

Report Consumption (Desktops, tablets, phones, etc.)

SSAS

Report Server

Report Server TempDB

Multidimensional

tabular

Power BI

Power BI 2.0 Architecture

CONCEPT

Metrics captured within the Site-Based Dashboard

Optimizing Accessibility

Decision-Action/Study-Adjust Support System Design and Development

Key Questions and Key Points:

- *Alignment between Information Portrayal* (what's portrayed and how) and the *'requirements' for decision to actions, adjustments, study-adjust driven* by a sense of urgency to improve performance and realize benefits is critical.

- How do we get what is typically an inter/multidisciplinary team of people, cutting across multiple functions,with IT perhaps at the 'heart' or 'mind' I guess of it, to wholistically and effective improve designs for Visible Performance Measurement Systems? What role can ISE play?

Operational Analytics enables us to understand this causal linkage to Benefits Realization and accelerates this causal path

Path between improvement projects and strategic objectives

Capabilities

A set of project deliverables enabling an organization to deliver a desired outcome They can be a service, function or operation that enables the organization to exploit opportunities. Capabilities exist prior to transition

Examples
- New project planning approach
- Organizational set-up of a factory to reduce waste
- An improved tool

Benefits

Measurable improvements providing a business advantage. Benefits can be both tangible or intangible, are often interconnected and stakeholder specific

Examples
- Increase of market share
- Shorter time to market
- Higher employee retention

Strategic Objectives

End Benefits

Intermediate Benefits

Outcomes

Capabilities

Deliverables

Improvement Projects

Organizational Adoption & Alignment to Solution(s)

Outcomes

A new operational state achieved after transition of capabilities into live operations Normally affecting real world behavior or circumstances, they are the manifestations of the future state implemented

Examples
- Project plans comply to improved approach
- Waste is handled according to new set-up
- New tool is being used by the organization

By What Method and How will We Know?

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How can you do this really fast?
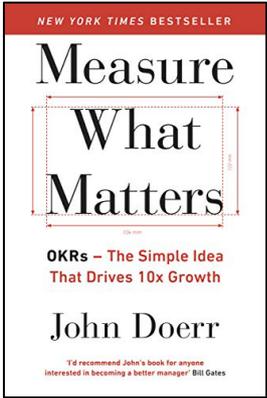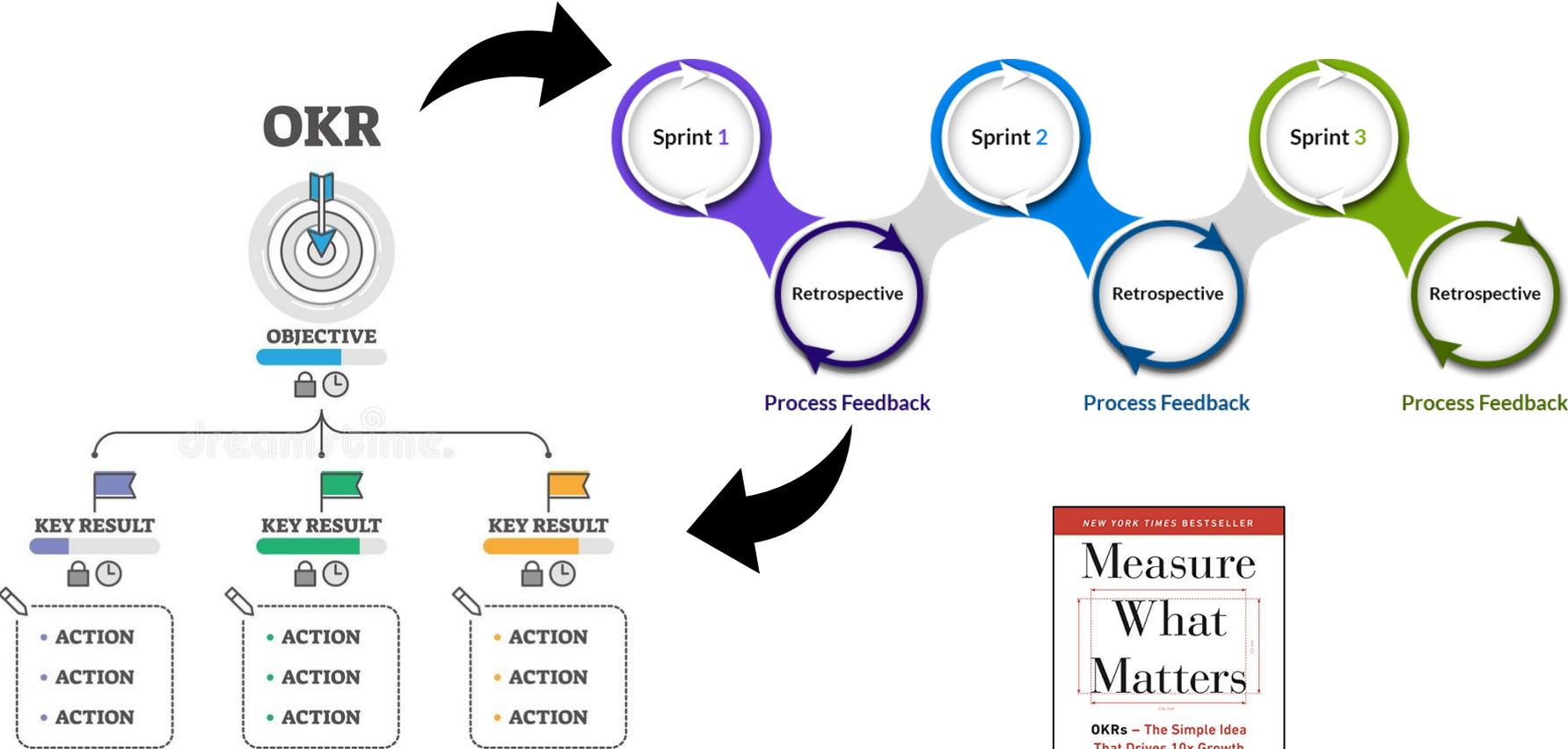
Key points--revisited

1. Good analytics come from good context understanding, use case clarity, *good problem/opportunity statements*, clear understanding of DONE

   - Good problem/opportunity statements have to be have an associated DONE and OKR's (Objectives and associated Key Results);

   - Analysts need an all-access pass to data and facts & the wisdom and intentionality to collect it

   - Simple techniques trump complex techniques

   - Framing Analytics work in the context of 'Good Strategy' is super critical.

2. Some people have every skill – *business acumen, data management, analytics understanding* – to perform a good Operational Analytics – but it tends to result in a slow 'craft' development process for most

   - Analytics exists on a steep learning curve – what used to take six months now takes two weeks with the right data and analytics

   - There is little time for 'craft' in our business – speed wins

   - Operational Analytics, generally speaking, is not being 'taught'. A few programs have outstanding curriculum but they are rare, in my view. They have over complicated analytics.

Key points--revisited

3. Investment in the data foundation has a positive ROI, as analysts move faster when they trust the data – results in faster results

    –   Rule for Data Management: storage and speed are generally not issues any more, if it's there store it, you might need it later (can always aggregate can't get more granular if it isn't there)

    –   Second Rule of Business Intelligence/Op Analytics – maintain the illusion of simplicity for your customers, Understand the Use Case and the stakeholders keep it simple for them. If there aren't 'aha' moments in your work you've failed.

4. Good data visualizations can tell the right story quickly, because people are predisposed to believe what they see in a chart …

    –   Be on guard! Some folks use *How to Lie with Statistics* as a field guide

    –   Kahneman's (Thinking Fast and Slow) and other research on Decision Making and Action Taking Styles and Methods are invaluable prep for Operational Analytics Specialists.

    –   Apply Pyramid Principle Thinking and Logic, learn to 'Resonate'/tell powerful stories with your data to provoke improved study-adjust and business value creation.

Key points

5. There is _very positive ROI_ in getting Operational Analytics well designed and developed– small analytics teams can wield disproportionate influence on the bottom line

   – Hire Intentionally and Intelligently– there are few people who have the curiosity, sense of urgency, tolerance of ambiguity, and humility for this role

   – The catalyst, change agent role is very powerful when powered with great Operational Analytics – get in, learn, analyze, win, get out

   – Portfolio Management is everything, it's a very dynamic process.

   – Understand the causal 'chains' and stay focused on 'drivers' and critical enablers, focus on the right 'levers'

6. Good Operational Analytics _provokes more timely decisions and actions_ – indeed, in most organizational systems, simple and persuasive/influential beats complex/ambiguous every time

   – Learn to Tell Stories on individual Slides and 'Decks' that Provoke timely improvement and accelerate benefits realization

   – Be a fast follower with Analytics Technology, people are enamored with shiny objects, keep it simple, more toys and elegance lose, pragmatic Operational Analytics aimed at rapidly improving process performance wins.

   – Stay focused on developing Process Maturity Levels systematically over time and use data/facts to support progress

Feature Extraction

Organizational System Key Result Area (KRA's)

- Effectiveness

- Efficiency

- Quality

- Productivity

- Innovation

- Quality of Work Life

- Profitability/Budgetability

- Sustainability/Resilience/Optionality

Key Results/Key Performance Indicators

One of the critical roles of the Analyst is to 'understand the system' (Deming's Profound Knowledge) causally and select the right metrics (Measure What Matters).

This is the essence of Feature Extraction.

Often this comes right from Value Stream Mapping and the identification of 'control points' (spots in a process were we do or can or should capture data and also where we can 'manage' the process).

Zoom In:
Saltine Line Control Points
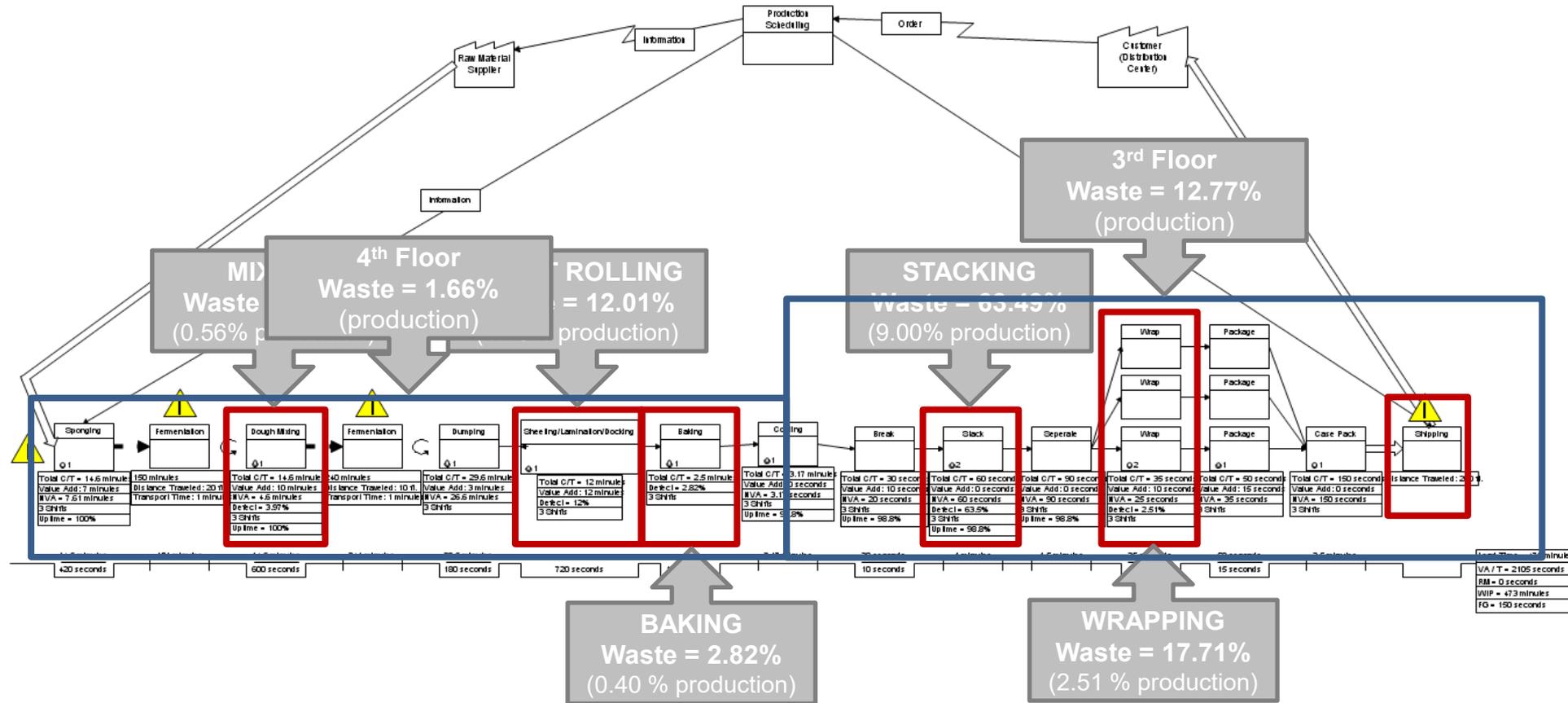
This problem is nothing new and has actually been the focus of prior improvement projects.
We will take a look at 2 project that have sought to reduce the process variability and in turn, reduce waste.

Knowledge Extraction

Key Results/KPI's (outputs from analytics

- Lead Time
- Throughput Capacity
- Process Capability
- Yield Loss
- Cycle times
- Takt time
- Engagement
- Competency Level
- Process Maturity Level
- Temperature
- Pressure
- Etc., etc.....

Data/Facts portrayed in a way that creates insights, tells a story, helps us see and understand, answers questions (Learning to See)

Analysts in Training struggle mightily with the difference between Feature Extraction and Knowledge Extraction and it can be subtle but often is very distinct and critical to success.

There is an art to it which is why it's difficult to teach and at times difficult to master.

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Webinar and Article 'Offer Elements' Plan & Calendar

Q4 2022 Theme—Org/Op Excellence in Turbulent Times

- September—Insightful Leadership: Surfing the Waves to Organizational Excellence (Jim Tompkins)

- September—Creating Improved Operational Excellence in Times of Economic Uncertainty and Challenges (David Poirier & Jim Dobson)

- December—Planning to Improve Productivity in Disruptive Economic Times (Scott Sink)

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ISE Body of Knowledge & Skills Development	Operational Analytics	Operational and Business Process Excellence
	Personal and Professional Mastery	

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Creating Improved Operational Excellence Resilience in the Face of a Steady Stream of Disruptions

Scott Sink
IISE Global Performance Excellence Webinar Series Director

David Poirier, P.E.
CEO The Poirier Group
https://www.linkedin.com/in/poirierdavid/

Jim Dobson, Partner
The Poirier Group
https://www.linkedin.com/in/jim-dobson-5b213510/

Regardless of your business situation in the post pandemic and current economic situation, here are some 'Insightful Leadership' to help you enhance your Productivity Improvement Efforts.

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ISE
INDUSTRIAL AND SYSTEMS ENGINEERING AT WORK

What's Your Story? Bill Franks

Resilience for the new Roaring '20s
How to ride the waves of disruptions

Growing leaders for the new world of work
Top *Problem Solved* episodes of the last year
The right containers as a Lean solution
NASA cultivates crops for space travel

Creating resilient organizational excellence programs amid major disruptions

The right strategies, mindsets needed to ride out these 'roaring '20s

By D. Scott Sink

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We'll build off our Op Ex/Analytics Series past and just ahead

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Operational Analytics

Improve your knowledge and skills with data and fact management, how to support timely decisions and actions.

- Operational Analytics: You Can't Manage What You Can't or Won't Measure
- Data Sciences 101: The Science Behind Data Sciences
- IISE Operational Analytics Certification Program Overview for Students and Practitioners
- Operational Analytics: The Analyst and Decision/Action Support Role
- Operational Analytics: The Data Management Role
- Data Analytics and AI: People, Process, and Technology
- Operational Analytics: IISE Certificate Program Overview
- Operational Analytics: Creating "AHA" Moment Visualizations
- The Role of Data and Information (Engineered Management Systems) in Periods of Major Disruption
- Operational Analytics: New Frontiers for ISEs
- Operational Analytics: Sustainable Visual Measurement Systems
- Operational Analytics for Integrated LeanSigma Process Improvement Projects Part IV
- Operational Analytics for Integrated LeanSigma Process Improvement Projects Part III
- Operational Analytics for Integrated LeanSigma Process Improvement Projects Part II
- Operational Analytics for Integrated LeanSigma Process Improvement Projects
- A Framework of Best Practices for Delivering Successful Artificial Intelligence Projects

[Back to top]

Operational and Business Process Excellence

Some organizations integrate Business Process Excellence perfectly. Others need a well-designed program. We'll show you how to jump-start a great Op Ex Program.

- Using Behavior Management Principles and Methods to Accelerate BPI Benefits Realization
- Strategic Performance Improvement Planning in Periods of Economic Disruption
- Business Process Improvement: Picking the Right Projects, Best Practice Portfolio Management in Times of Economic Challenge
- Business Process Improvement Portfolio Management: Picking the Right Projects to Drive Enterprise Value Better and Faster
- Achieving Resilient Organizational Excellence in the Face of Continuing Disruptions
- Agile Operational Excellence/Business Process Improvement
- IISE Annual Conference 2022: The Performance Excellence Track Detailed Preview
- The New Industrial Engineering: Integrated Systems Engineering and Management Systems Engineering
- Building Performance Management Systems: Sharing Lessons Learned
- Business Process Management 4.0 – Glimpses of What's Ahead
- Engineering Social Service Systems
- Operational Excellence: Creating Strategies and Migration Plans for Large-Scale Improvement Initiatives

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Operations Analysis

The abundance and growth of machine data, which can include anything from IT machines to sensors and meters and GPS devices, is another major driver of big data solutions. In its raw format, many organizations are unable to leverage machine data. Yet disregarding this data means that organizations are making business decisions based only on a subset of available information. Leveraging machine data and combining it with existing enterprise data enables a new generation of applications that are able to analyze and gain insight from large volumes of multi-structured machine data—which in turn improves business results.
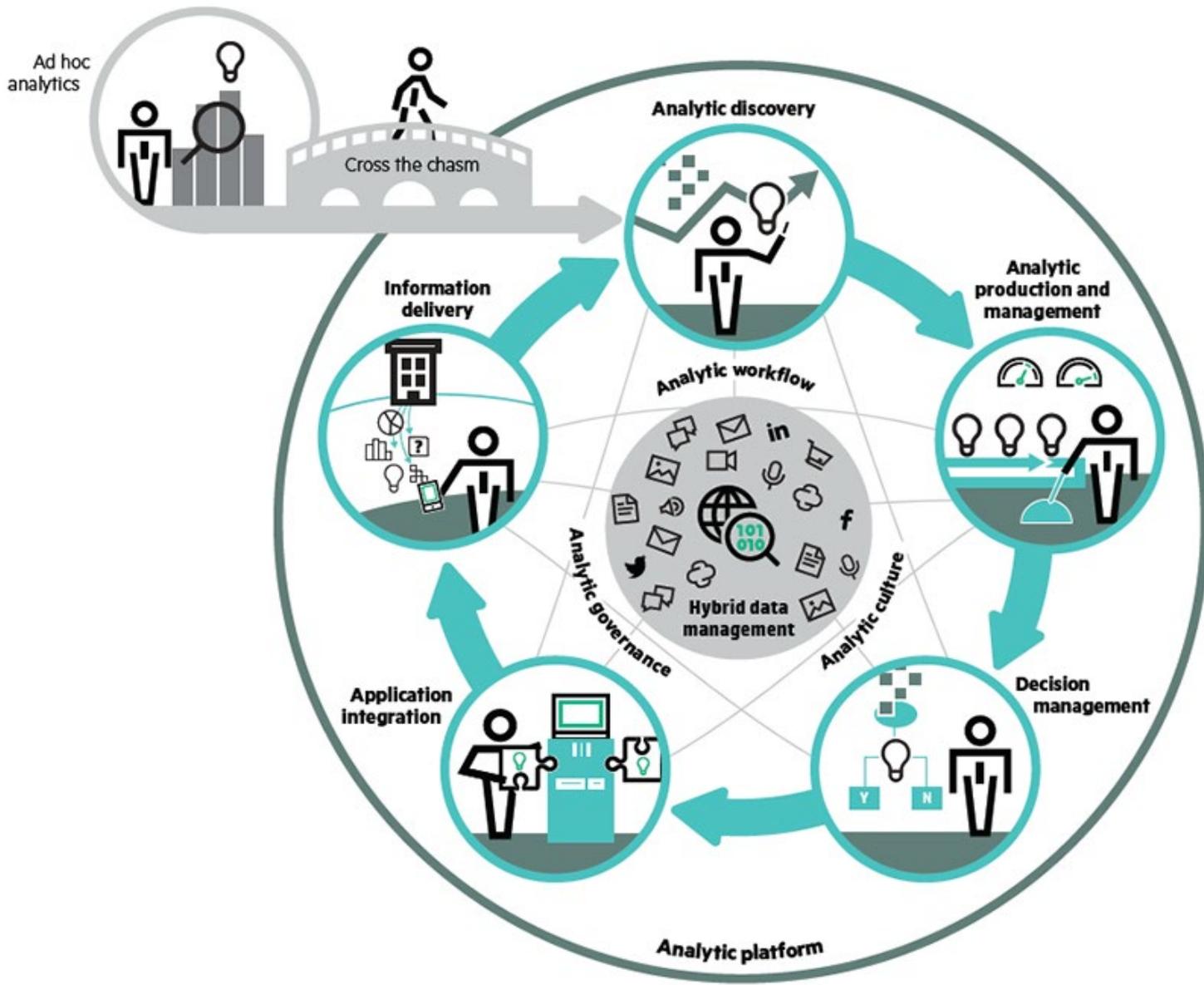
Raw Logs & Machine Data

Enterprise Data

Capture a Complete View
Access large volumes of machine, operational and transactional data and combine with other enterprise data.

Get the Context
Overcome complexities to perform advanced analysis and provide context across different data sets.

Get Insights From Analytics
Release intelligence trapped in your data, allowing agile interpretation and action.

WHAT DO YOU NEED TO SUCCEED?

THE RESULTS

Empower the C-Suite
Reassure decision makers that they are acting with full knowledge & understanding of *all* available data.

Improve Reliability
Perform root cause analysis on data to more easily identify and preempt system failures, keeping customers happy.

Speed Operations
Help departments proactively minimize the problems and bottlenecks that stymie the flow of operations.

Monitor & React
Visualize streaming data to monitor the end-to-end infrastructure and deliver real-time alerts.
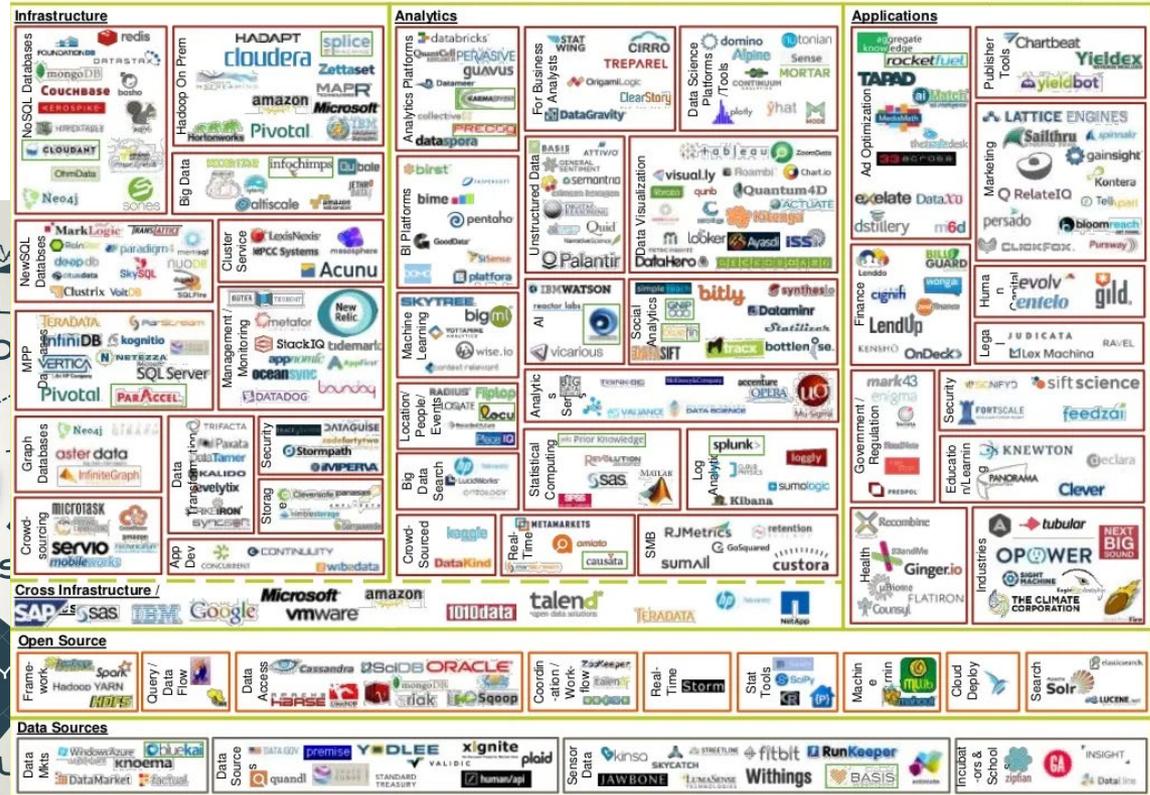
Learn more at **IBM.com/BigData**

IBM

Moving from Ad Hoc, Process Maturity Level 1 with Operational Analytics to PML's 3-5 as appropriate.

A nice picture for Op Analytics I think...

https://hbr.org/2012/10/the-true-measures-of-success

https://hbr.org/2017/05/whats-your-data-strategy

# Operational Analytics, done right, minimizes latencies and enhances ability to drive more rapid benefits realization

Reduce the cycle times on each step in this implicit process
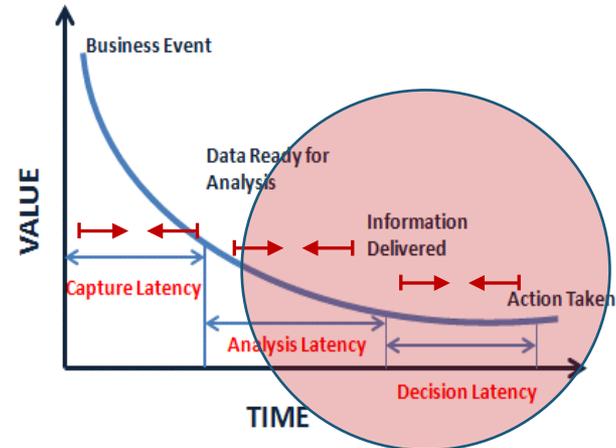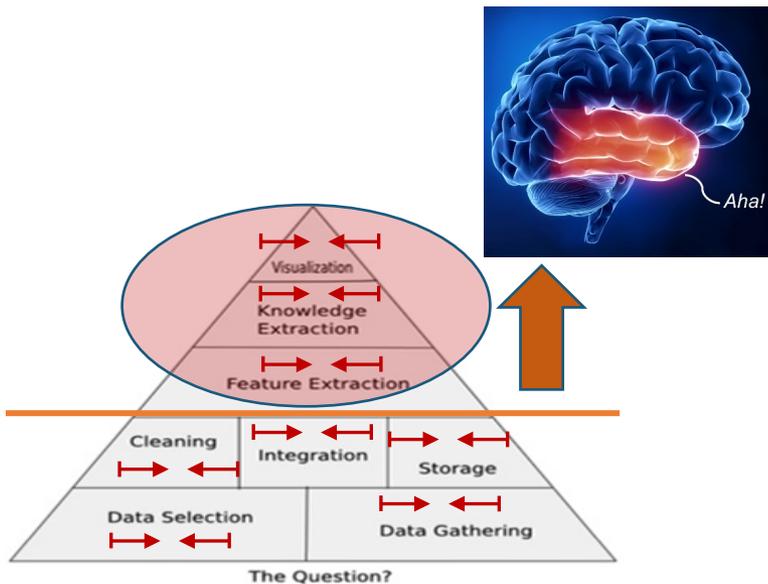
Executing the Analytics Triangle effectively enables more rapid decisions and actions and positions for more rapid benefits realization.

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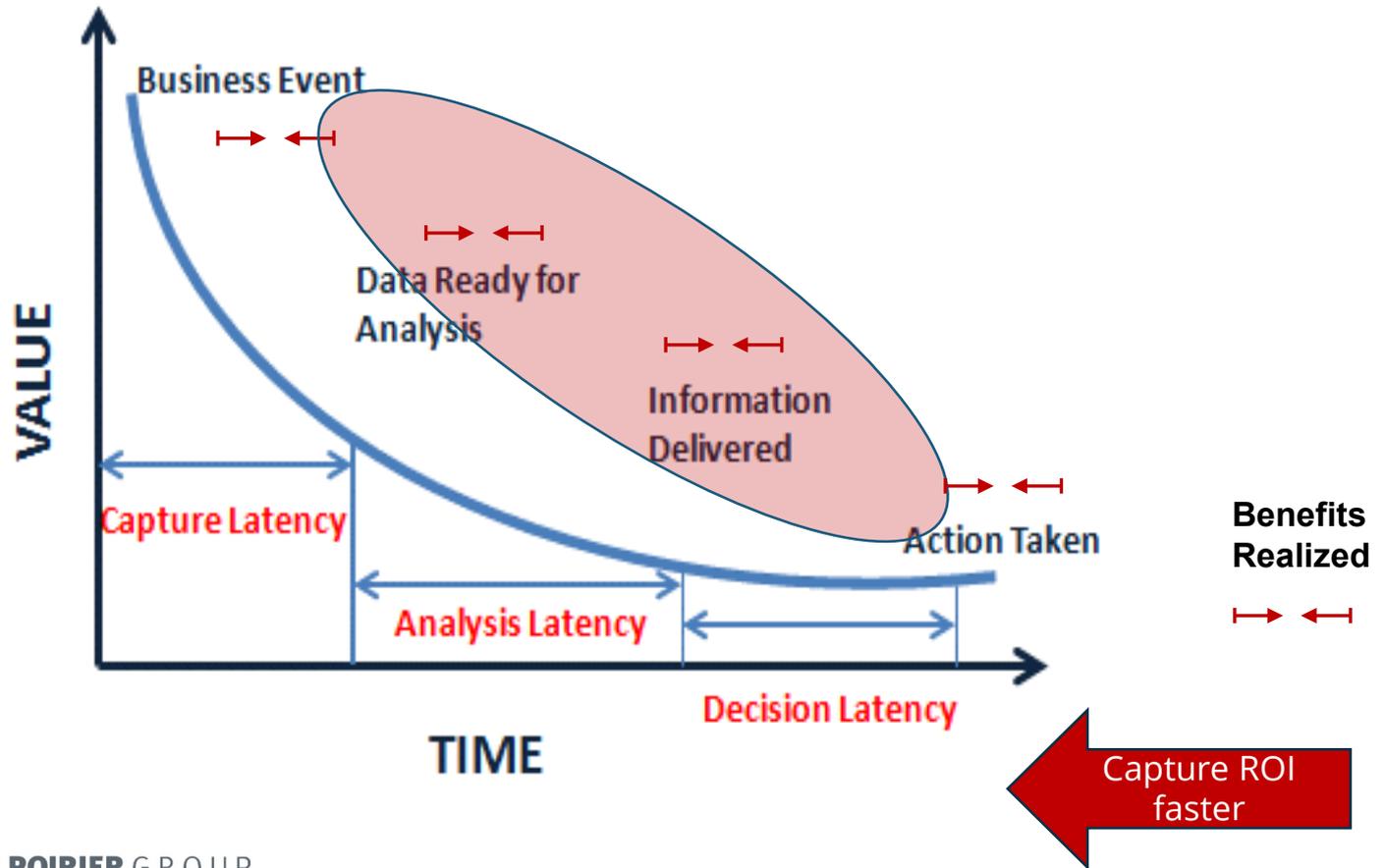
No Time for Muddle....it's a time for "Triple-Loop Learning"

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