Data Literacy Planning Session: University of Georgia

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Data & Analytics Group- Office of the CDO

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Data Literacy Planning Session: Discussion Outline

- Introductions & Expectations
- Observations from Morning Session?

- Setting Context: Needs, Drivers and Priorities
- Data Literacy Assessment (Group Exercise)

- Next-Steps/Planning

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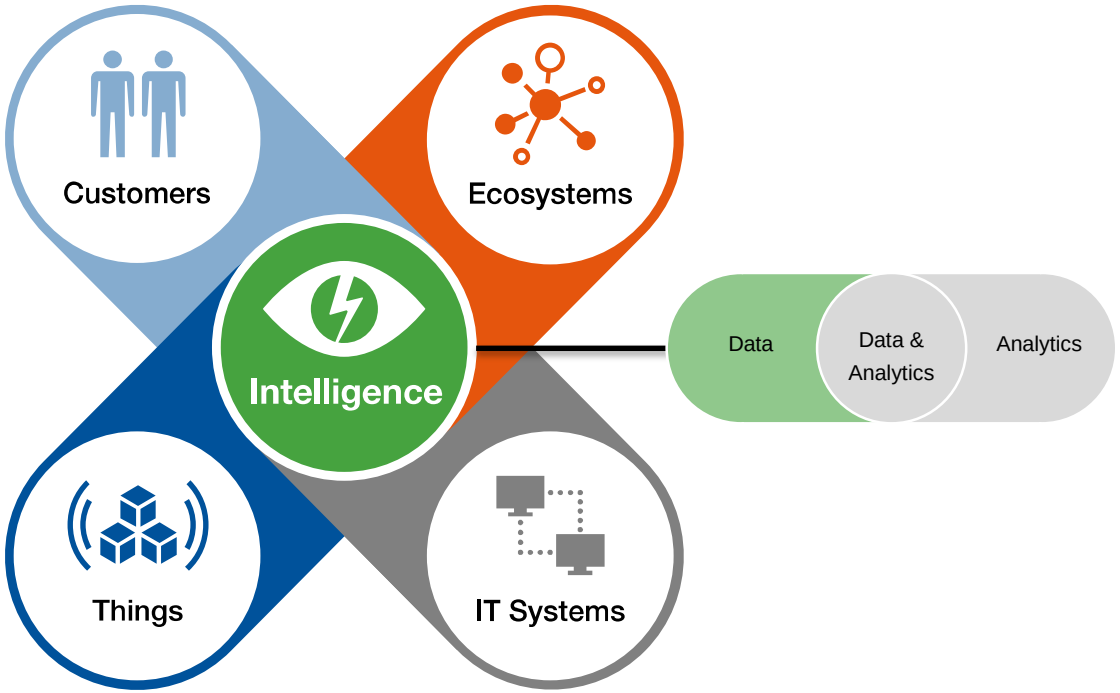
Digital Context: Data and Analytics at the Heart of It All

Data and analytics are central to competitive differentiation, innovation, process automation and powering new business models …



… and this is only going to get more complex, with data and analytics pervasive to every industry, process, role and decision.

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Data-Driven Means a Change of Mindset and Behavior

Ownership → Stewardship	Byproduct → Product
Control → Influence	Liability → Asset
Securing → Sharing	Truth → Trust
Governance → Enablement	No Value → Value
Compliance → Ethics	Internal → External

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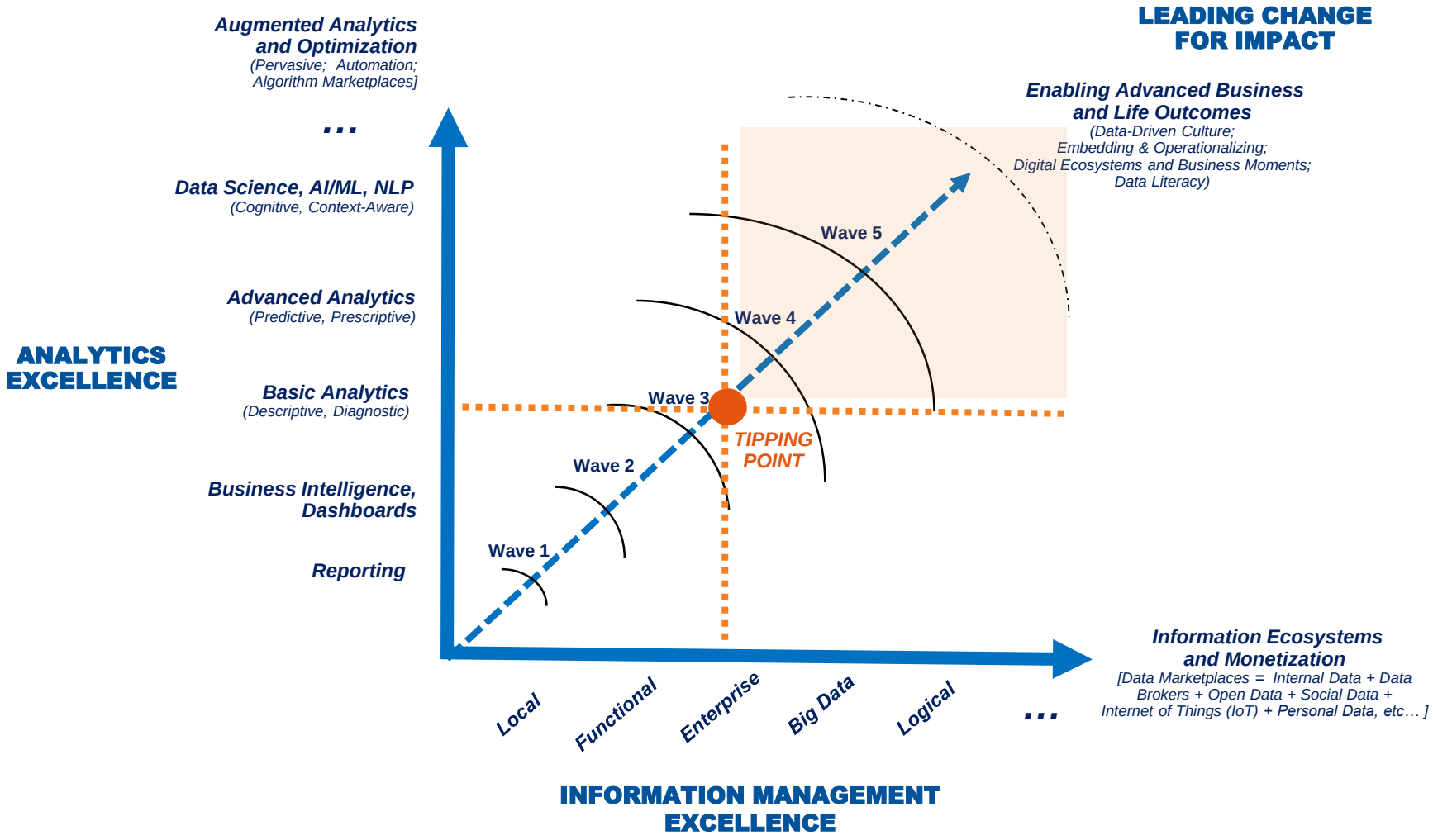
Information & Analytics Evolution Model V2.2

A conceptual view of the market evolution



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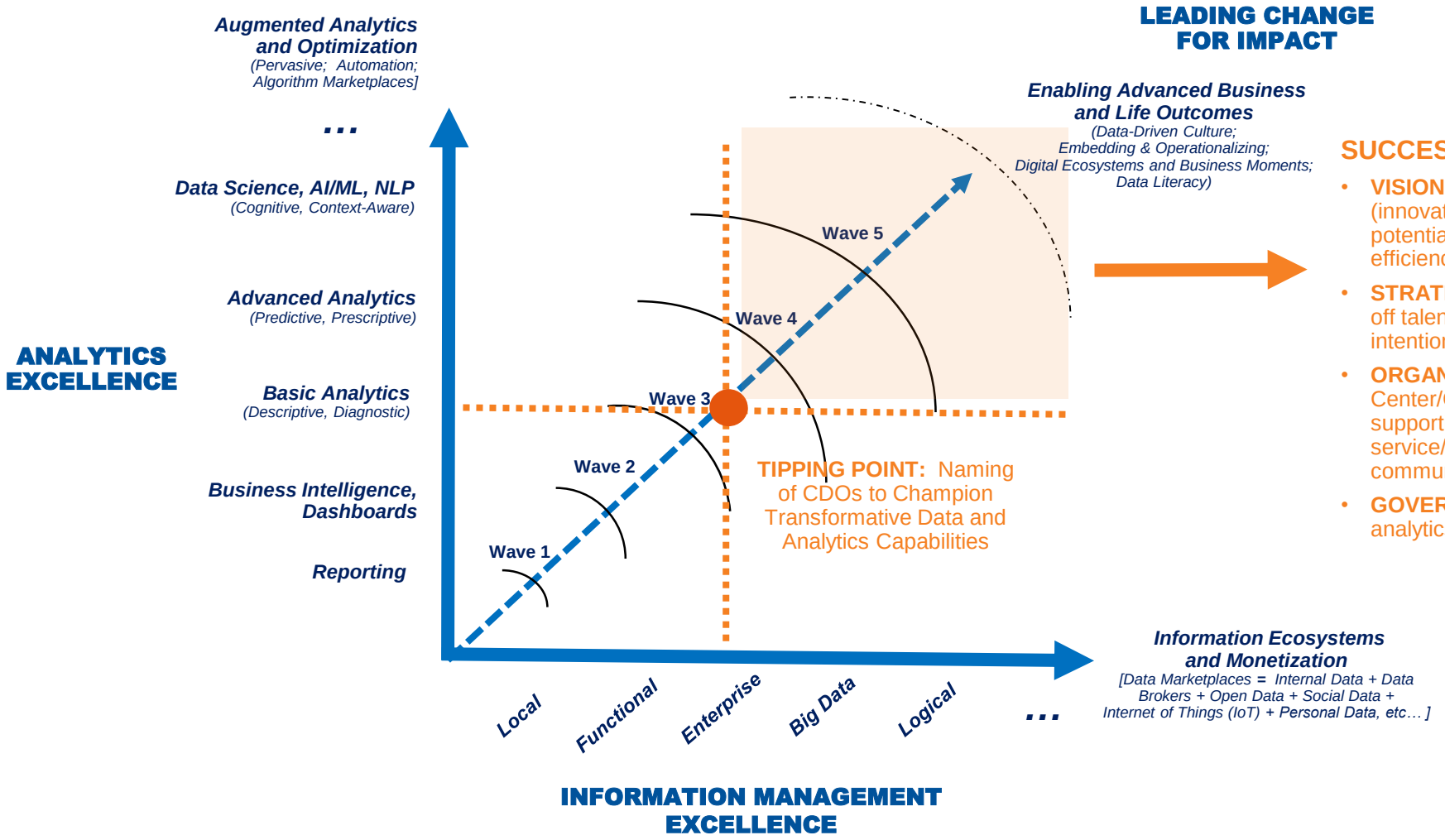
Information & Analytics Evolution Model V2.2

We are at a Tipping Point!



SUCCESS FACTORS:

- **VISION & VALUE: Offense and Defense** (innovative use cases for growth and potential monetization plays, plus efficiency and risk management plays)
- **STRATEGY: Bimodal Approach** (Carve off talent and infrastructure capacity to intentionally support the core, and explore)
- **ORGANIZATION: Hybrid CoE** (Analytics Center/Community of Excellence with supportive hub and empowered self-service/citizen model; active communications, sharing successes)
- **GOVERNANCE: Integrated** (Data AND analytics governance model)

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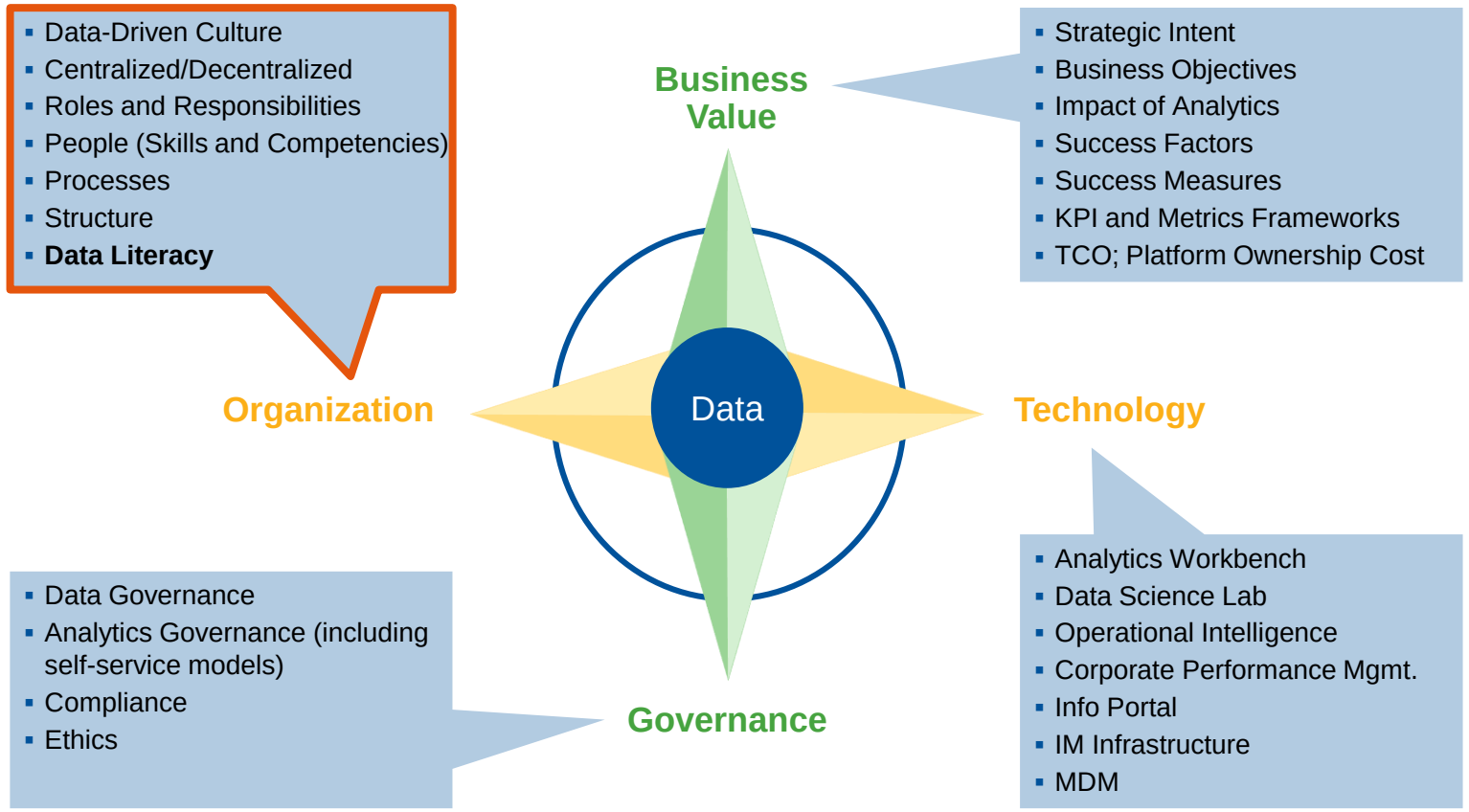
Strategy: A Balancing Act of 4 Key Elements



Gartner Business Intelligence & Analytics Strategy Compass

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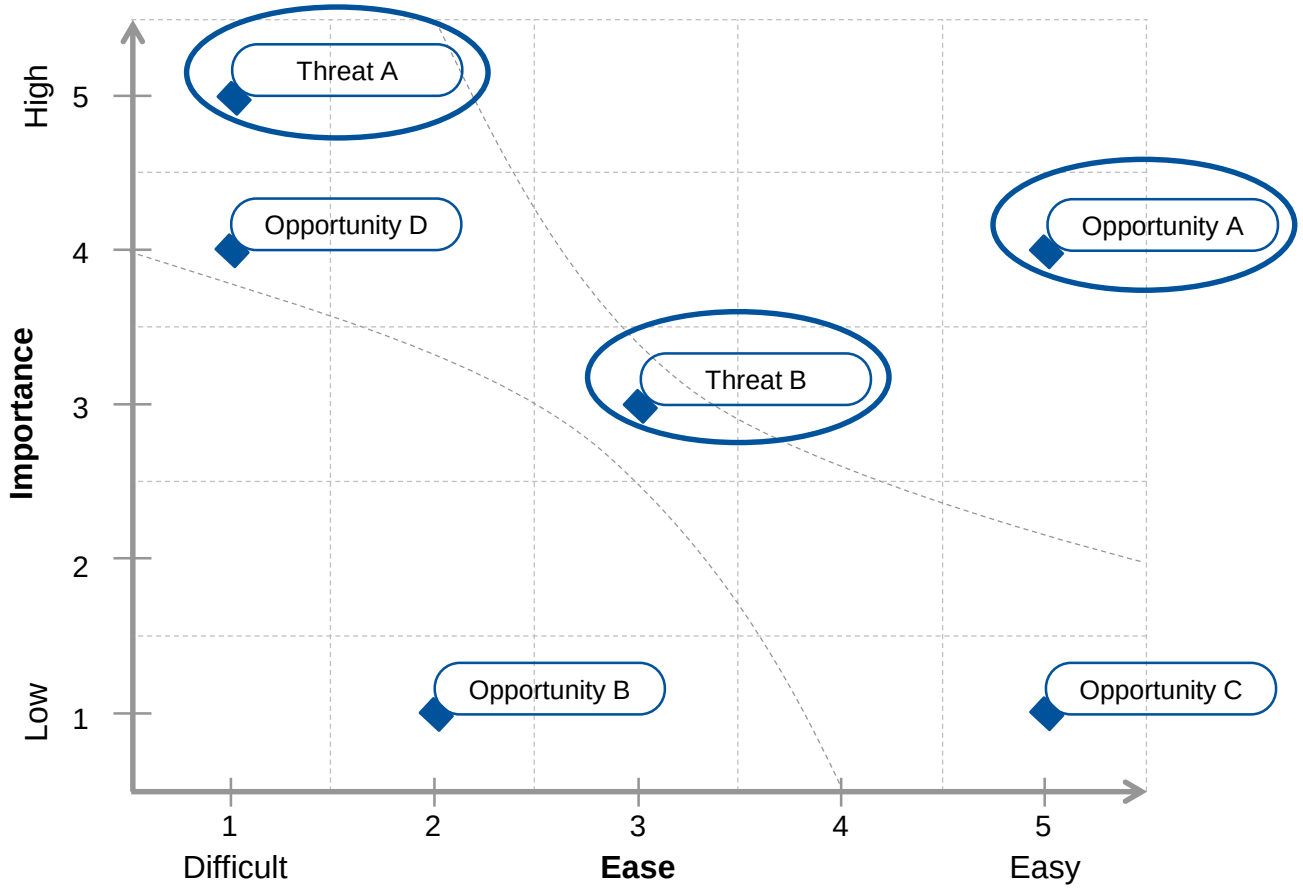
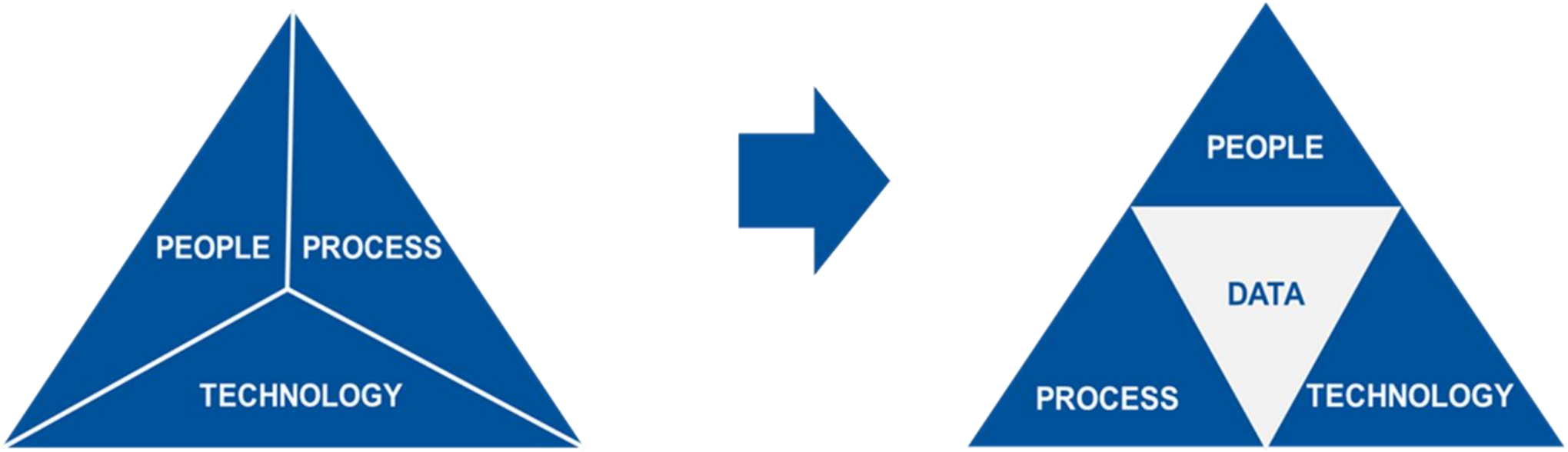
Strategy: Picking Your Bets with Program Prioritization



Defining Data Literacy:
The New Core Capability of Digital Society

While conversant in the "people, process and technology" capabilities of business change, most executives and professionals do not speak "data" fluently as the new critical capability of digital society.



Gartner formally defines data literacy as:

The ability to read, write and communicate data in context, including an understanding of data sources and constructs, analytical methods and techniques applied, and the ability to describe the use-case application and resulting value.

Informally … do you "speak data?"

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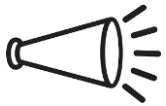
Describing Information as a Second Language
Approaching Data Literacy as Language Development

ISL

Information as a Second Language (ISL):
Enabling Data Literacy for Digital Society

A Base Vocabulary:

- Managing Information
- Analyzing Information
- Applying Information and Leading Change



A Set of Dialects:

- Industry Vertical Domains
- Business Process Domains
- Technical Domains

Levels of Proficiency:

- Conversational
- Literacy
- Competency
- Fluency
- Multilingual

Language Development:

- Getting Started
- Assessing Data Literacy
- Proof of Concept
- Training, Development and Certification
- Leading by Example

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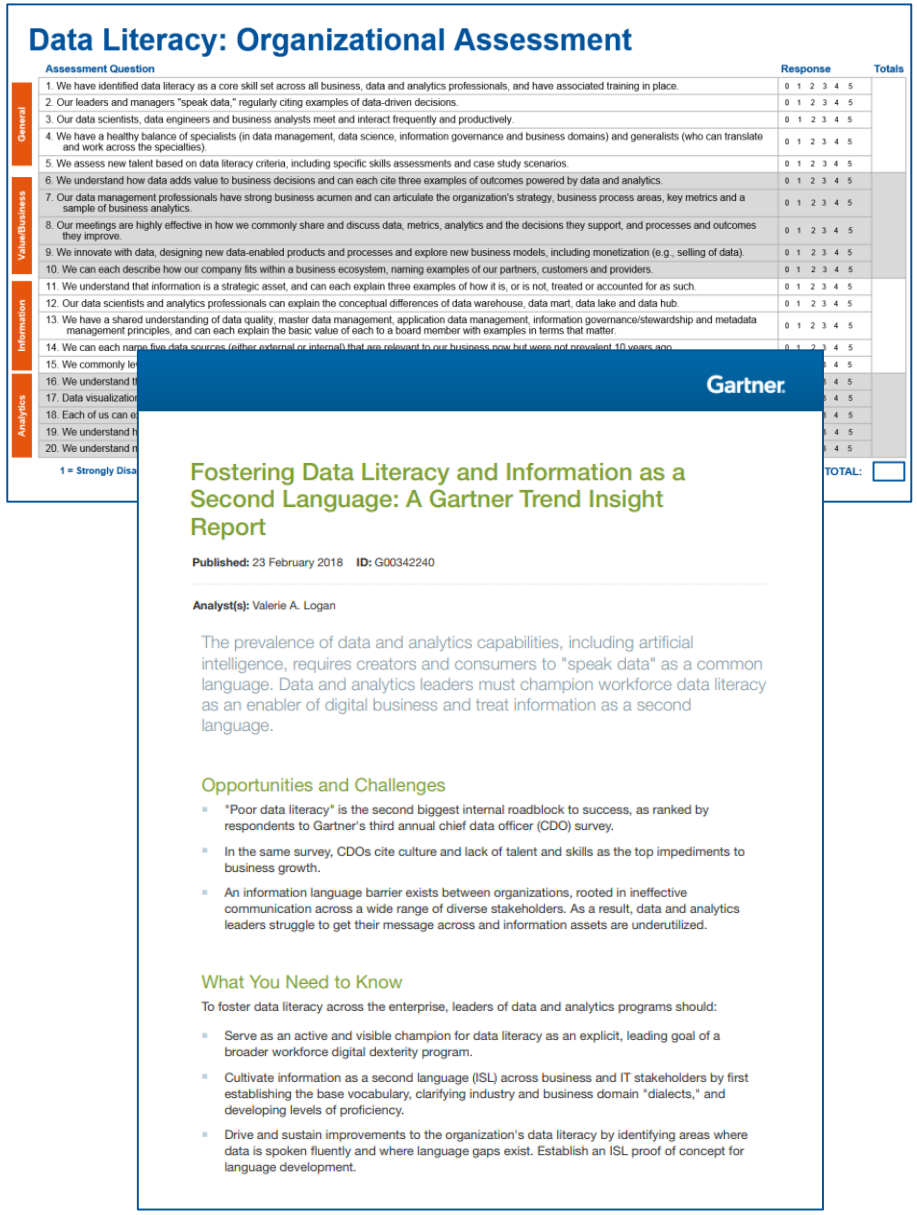
Recommendations

- ✓ **Champion and evangelize data literacy.** Name it, claim it and give it an identity. Partner with your company CDO (or equivalent senior leader), and other executives who get it. Create the narrative.
- ✓ **Assess and baseline levels of data literacy** in the organization and match these to the competencies, skills and talents required. Conduct initial data literacy workshops, assess levels and socialize findings.
- ✓ **Evaluate overall maturity of your data and analytics capabilities** using Gartner's ITScore models, where the people/organization dimensions provide context for data literacy.
- ✓ **Build data literacy into your data and analytics program plan** to address key skill gaps and development needs.
- ✓ Working with HR, develop a **pilot data literacy training program.**
- ✓ **Track progress** and evolve the program: Regularly conduct data literacy assessments in key roles and across the organization.
- ✓ **Stay connected to emerging developments** in the data literacy area!



Data Literacy Assessment

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About the Data Literacy Assessment

- **Organization assessment** for teams, divisions or organizations:
  - An initial gauge of overall data literacy with 20 questions.
  - To be used periodically to establish an initial baseline and then measure periodically to assess improvement.
  - Organized across four sections to highlight areas of relative strength/weakness.
  - Can be applied with teams of:
    - **Creators** or those who create/produce data and analytical solutions:
      - Examples: CDO, data engineer, data scientist, program manager
    - **Consumers** or those who use data and analytical solutions:
      - Examples: an executive, business analyst, analytics power user, citizen data scientist, frontline worker
  - **Note:** This assessment can be conducted along with overall data and analytics maturity assessments, as a deeper look into talent and skills needs within the people/organization.

Workshop: Assessment Exercise Instructions

- For this exercise, pick a team, group or organization at your company.
- Answer the team data literacy assessment questions from the perspective of that team's manager/leader.
- 20 questions, where you will answer one of the following:

1 = Strongly Disagree **2 = Disagree** **3 = Neutral** **4 = Agree** **5 = Strongly Agree (If No Capability, Mark 0)**

- Examples:
  - If you are a manager, answer on behalf of your team.
  - If you are a business unit leader, answer on behalf of your organization.
  - If you are an individual contributor, answer on behalf of your manager for your team.

Assessing Data Literacy Organizational Assessment

ASSESSMENT INSTRUCTIONS

Read the 20 statements and answer on behalf of your team, division or organization. Respond to each with a 1 to 5, where:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree. (If No Capability, Mark 0.)

ASSESSMENT INFORMATION

Organization Name: _____

Survey Completed by: _____

Date Taken: _____

ASSESSMENT RESULTS

Section Score — General: _____**/25**

Section Score — Value/Business: _____**/25**

Section Score — Information: _____**/25**

Section Score — Analytics: _____**/25**

TOTAL DATA LITERACY SCORE: _____**/100**

ADDITIONAL NOTES

Add any additional findings, observations or insights gained during the assessment process.

_____

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Sum your points by section to identify relative strengths and gaps. Total all sections to identify your organization's overall data literacy score.

0-20 **"Conversational"**

Basic understanding of some of the concepts of data, analytics and use cases exist but are not shared commonly. While some concepts are understood, the ability to explain them is localized.

21-40 **"Literate"**

General capabilities exist. Pockets of data literacy within domains, with the ability to speak, write and engage in data and analytics programs and use cases. Extra effort is required for translation and bridging communication gaps. We "get it," but can't explain it.

41-60 **"Competent"**

Sustained competency in designing, developing and applying data and analytics programs for business value. Next step: Formalizing data literacy beyond the core data management and data science teams.

61-80 **"Fluent"**

Fluency across all three elements of the information language across most business domains within the organization. Differentiating capability. Opportunity to create cross-enterprise capability — make it pervasive.

81-100 **"Multilingual"**

Transformational capability. Organic to the culture. Fluency across all three elements of the information language across multiple business domains. Significant digital advantage and agility within your industry and ecosystem.

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Data Literacy: Organizational Assessment

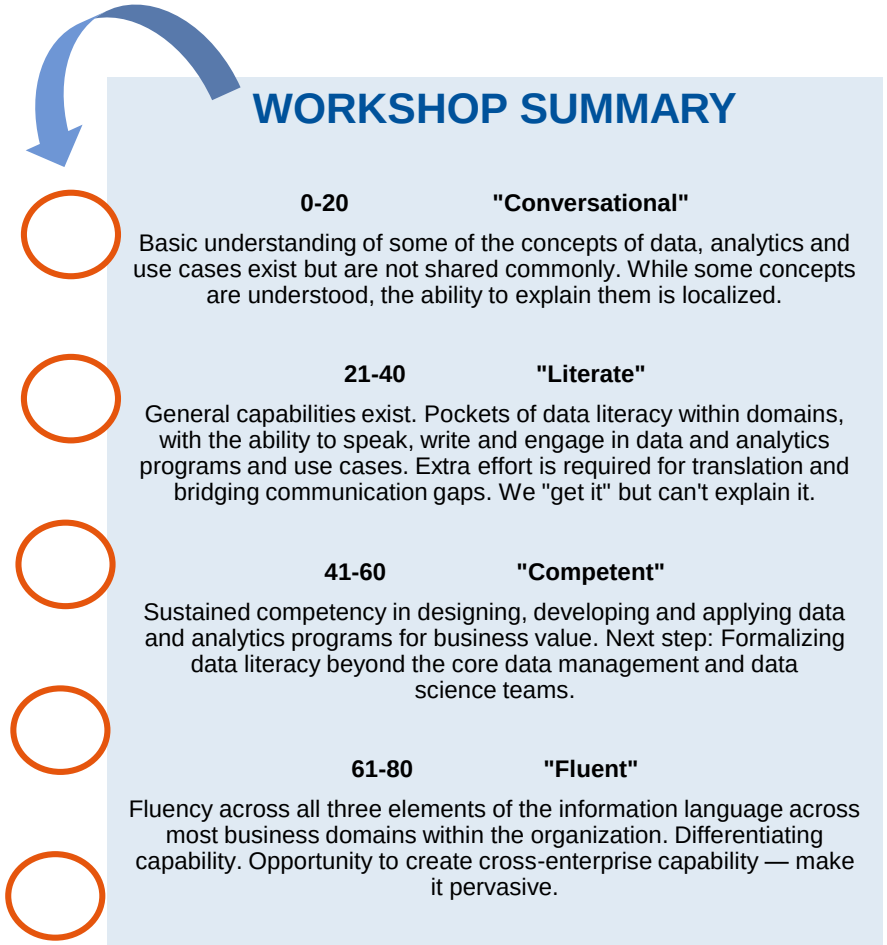
	Assessment Question	Response	Totals
General	1. We have identified data literacy as a core skill set across all business, data and analytics professionals, and have associated training in place.	0 1 2 3 4 5	
	2. Our leaders and managers "speak data," regularly citing examples of data-driven decisions.	0 1 2 3 4 5	
	3. Our data scientists, data engineers and business analysts meet and interact frequently and productively.	0 1 2 3 4 5	
	4. We have a healthy balance of specialists (in data management, data science, information governance and business domains) and generalists (who can translate and work across the specialties).	0 1 2 3 4 5	
	5. We assess new talent based on data literacy criteria, including specific skills assessments and case study scenarios.	0 1 2 3 4 5	
Value/Business	6. We understand how data adds value to business decisions and can each cite three examples of outcomes powered by data and analytics.	0 1 2 3 4 5	
	7. Our data management professionals have strong business acumen and can articulate the organization's strategy, business process areas, key metrics and a sample of business analytics.	0 1 2 3 4 5	
	8. Our meetings are highly effective in how we commonly share and discuss data, metrics, analytics and the decisions they support, and processes and outcomes they improve.	0 1 2 3 4 5	
	9. We innovate with data, designing new data-enabled products and processes and explore new business models, including monetization (e.g., selling of data).	0 1 2 3 4 5	
	10. We can each describe how our company fits within a business ecosystem, naming examples of our partners, customers and providers.	0 1 2 3 4 5	
Information	11. We understand that information is a strategic asset, and can each explain three examples of how it is, or is not, treated or accounted for as such.	0 1 2 3 4 5	
	12. Our data scientists and analytics professionals can explain the conceptual differences of data warehouse, data mart, data lake and data hub.	0 1 2 3 4 5	
	13. We have a shared understanding of data quality, master data management, application data management, information governance/stewardship and metadata management principles, and can each explain the basic value of each to a board member with examples in terms that matter.	0 1 2 3 4 5	
	14. We can each name five data sources (either external or internal) that are relevant to our business now but were not prevalent 10 years ago.	0 1 2 3 4 5	
	15. We commonly leverage data-discovery capabilities and tools to accelerate exploration, ingestion and management of new data.	0 1 2 3 4 5	
Analytics	16. We understand the difference between predictive and prescriptive analytics and can all give an example of each.	0 1 2 3 4 5	
	17. Data visualization and storytelling techniques are commonly used. Each of us can confidently stand up and tell a story with data and visualization.	0 1 2 3 4 5	
	18. Each of us can explain the following terms confidently: Mean, median, mode, standard deviation.	0 1 2 3 4 5	
	19. We understand how natural-language processing and natural-language generation are applied and can describe use cases of each technique.	0 1 2 3 4 5	
	20. We understand machine learning and artificial intelligence capabilities and can each describe 3 use cases of ML/AI.	0 1 2 3 4 5	

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. (If No Capability, Mark 0.)

TOTAL:

Section Recap: Data Literacy Organization Assessment

- Group readout:
  - Overall data literacy levels?
- Do you feel this is a fair reflection of your team's data literacy level?
- Any areas for improvement with the assessment?



Data Literacy: Next Steps/Planning

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Developing Data Literacy
Initiate a Data Literacy/ISL Proof of Concept

- **Select an area or outcome** where clear language gaps have surfaced and you have willing, diverse participants.
- **Conduct a data literacy/ISL workshop** where each participant describes in their own language:
  1. A real-life, common use case, and
  2. A use case within your organization.
- **Collectively identify observed similarities and differences**. Capture lessons learned.
- **Repeat the exercise**, benefiting from hearing and incorporating others' language. Note improvements.
- **Broadcast the story** to raise awareness and understanding of the data literacy gap.

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Developing Data Literacy
Assess Data Literacy and Identify Development Needs

- Drive and sustain improvements in your organization's data literacy by **identifying areas where data is spoken fluently and where language gaps exist:**
  - **Who are your translators?**
  - **Who is fluent?**
- **Conduct data literacy assessments** across various teams and organizations. Identify and summarize gaps. Use as a baseline.
- **Make it fun!** Be creative. You can do games, quizzes and team sports. Have teams video record their experiences and share them. Remove any stigmas associated with what they may not know by creating a fun, safe environment for learning from each other.
- **Leverage available resources (internal and external)** to address development needs.

Developing Data Literacy Lead by Example

- **Change the way you interact** with your peers, stakeholders and leaders by **"speaking data" in context** in everyday interactions, board meetings and as a basis for outcome-oriented business cases.

- **Actively leverage the "VIA" model**, remembering to highlight the outcome/value, related data sources and applied analytical methods.

- Actively **champion data literacy** with ongoing assessment of literacy levels and aggressive support of training and development plans.

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Wrap-up!

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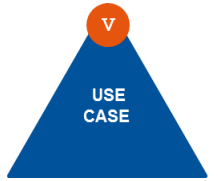
Recommended Gartner Research

General: Data Literacy and Digital Dexterity/Society

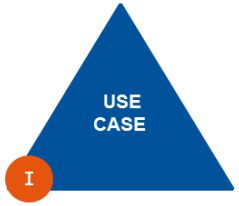
- SPECIAL REPORT: Fostering Data Literacy and Information as a Second Language: A Gartner Trend Insight Report
- "Information as a Second Language: Enabling Data Literacy for Digital Society" and related Webinar
- "Beyond BI Reporting: Engaging Decision Makers Through Data Storytelling"
- "Use Three Elements of Data Storytelling for Maximum Impact"
- "How to Establish a Data-Driven Culture in the Digital Workplace"
- "Deliver Digital Business Results by Boosting Workforce Digital Dexterity"
- "Toolkit: Survey Your Workers on the State of Your Digital Workplace"

Value/Business Acumen



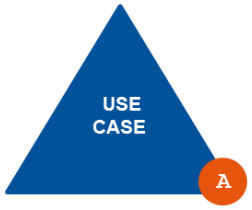
- "The '3B's' of Engagement: Business Architecture, Business Process and Business Outcomes"
- "How to Make the Business Case for Analytics"
- "How Chief Data Officers Can Succeed by Driving Analytic Value"
- "Fifty Examples of Digital Business: A CIO and CEO Resource"
- "Connect Business Moments, Personas and Journey Maps to Boost Customer Experience Outcomes"
- "Develop the Competencies Your Workforce Needs for the Digital Ecosystem"
- "CIOs Must Build Greater Business Acumen in IT for Digital Business"

Information/Data Acumen



- "Introduction to Gartner's Information Capabilities Framework"
- "Embrace Self-Service Data Preparation Tools for Agility, but Govern to Avoid Data Chaos"
- "Use Data Virtualization to Help Resolve Data Silos"
- "Understand the Data Brokerage Market Before Choosing a Provider"
- "How to Adopt Open Data for Business Data and Analytics — And Why You Should"
- "Organizations Will Need to Tackle Three Challenges to Curb Unstructured Data Glut and Neglect"
- "Toolkit: Enterprise Information Management Maturity Self-Assessment"

Analytics/Data Science Acumen



- "Extend Your Portfolio of Analytics Capabilities"
- "Domain Analytics: Harnessing the Pervasive Nature of Analytics"
- "Advancing Business With Advanced Analytics"
- "Augmented Analytics Is the Future of Data and Analytics"
- "How Data Science Projects Deliver Business Impacts"
- "Top 10 Things CIOs and CDOs Need to Know About Algorithmic Business"
- "Machine Learning: FAQ From Clients"
- "ITScore for BI and Analytics"

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Sample of Additional Resources

The following have been identified as a sample of additional resources representing early developments in the emerging area of data literacy. Gartner does not cover these providers formally but is highlighting notable bodies of work identified during development of this Toolkit.

Services, Software and Solution Providers:

- Ambient Intelligence — Marie Clark; talent identification machine learning algorithm.
- Z. Gemignani and C. Gemignani, "Data Fluency: Empowering Your Organization With Effective Data Communication," Juice.
- "Data Literacy for Everyone," Qlik.
- "Project-Based Learning, Data Literacy and Online Resources," SAS.
- "Data Learning Solutions for Your Workforce," Tuva.

University and Academic Offerings, Case Studies *(many early developments in data and information literacy are emerging from the education sector):*

- "Carnegie Math Pathways," The Carnegie Foundation for the Advancement of Teaching.
- "Strategies and Best Practices for Data Literacy Education," Dalhousie University.
- "Data Literacy and Data Visualization," The Ohio State University.
- D. Herzog, "Data Literacy: A User's Guide"
- "University of Georgia: Data Literacy Prepares Students for the Future," Tableau.
- "Developing Data Literacy Programs: Working with Faculty, Graduate Students and Undergraduates," Bulletin of the Association for Information Science and Technology.

Additional Resources:

- "The Ultimate Data Literacy Cheat Sheet," ChartMogul.
- DataKind — brings high-impact organizations together with data scientists to use data science in the service of humanity.
- Data-Pop Alliance — a global data coalition created by the Harvard Humanitarian Initiative, MIT Media Lab and Overseas Development Institute that brings together researchers, experts, practitioners and activists to promote a people-centered big data revolution.
- Data Science Central — an open community of and for data scientists.
- data.world — building a platform for finding and using the vast array of high-quality open datasets.
- Kaggle — a crowdsourcing platform for predictive modelling and analytics competitions; owned by Alphabet.
- KDnuggets — site for business analytics, big data, data mining, data science and machine learning information, including datasets and courses.

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Thank you! Let's connect!

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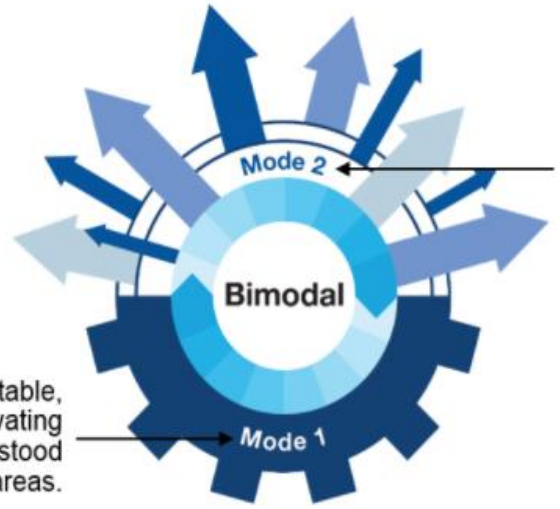
APPENDIX
Additional Data & Analytics Detail

Bimodal Approach: Two speeds- Core & Explore

Bimodal is the practice of managing two separate but coherent styles of work, one focused on predictability and the other on exploration.



Mode 2 is exploratory, experimenting to solve new problems

Mode 1 is predictable, improving and renovating in more well-understood areas.

Mode 1		Mode 2
▪ Reliability and stability ▪ Broad information reuse	Vision	▪ Adaptability and agility ▪ Customer experience and engagement
▪ Multiyear time frame ▪ Broad-based participation	Strategy	▪ Time frame in weeks (or even days) ▪ Project-based participation
▪ Quantifies and supports long-term ROI	Metrics	▪ Tracks execution of initiative ▪ Supports sense and respond
▪ Approval-based ▪ Planned	Information Governance	▪ Process-based ▪ Empirical
▪ Stable roles based on function	Organization and Roles	▪ Ad hoc cross-functional teams ▪ "Citizen" roles
▪ Information flows across business and processes	Information Life Cycle	▪ High-value, rapidly depreciating ▪ Value is relationship-based
▪ IT budget ▪ Strategic vendors, on-premises	Enabling Infrastructure	▪ Business unit budget ▪ Tactical vendors, cloud

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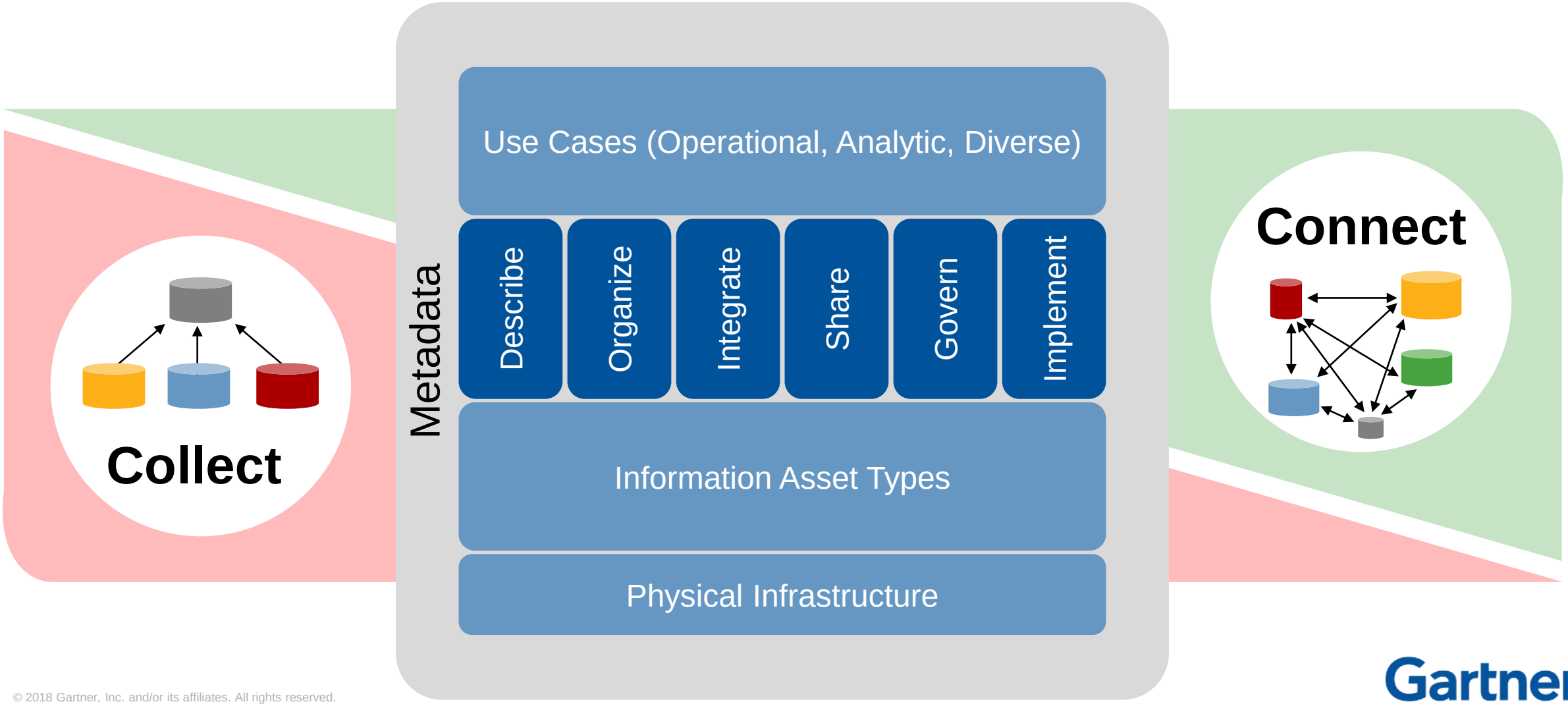
Components of a Data Management Infrastructure for Flexible Deployment



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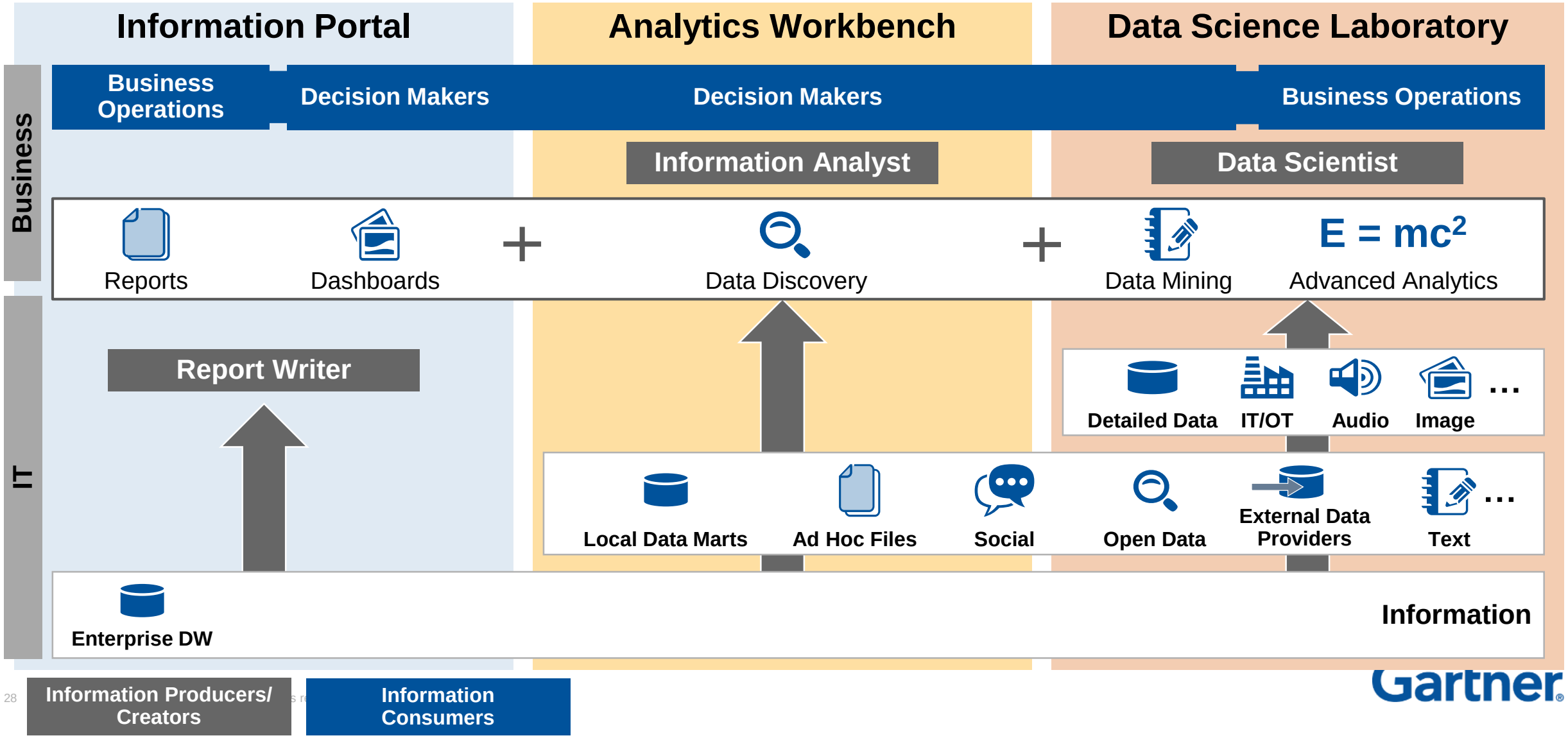
Delivering Insights: From Casual, Self-Service to Advanced



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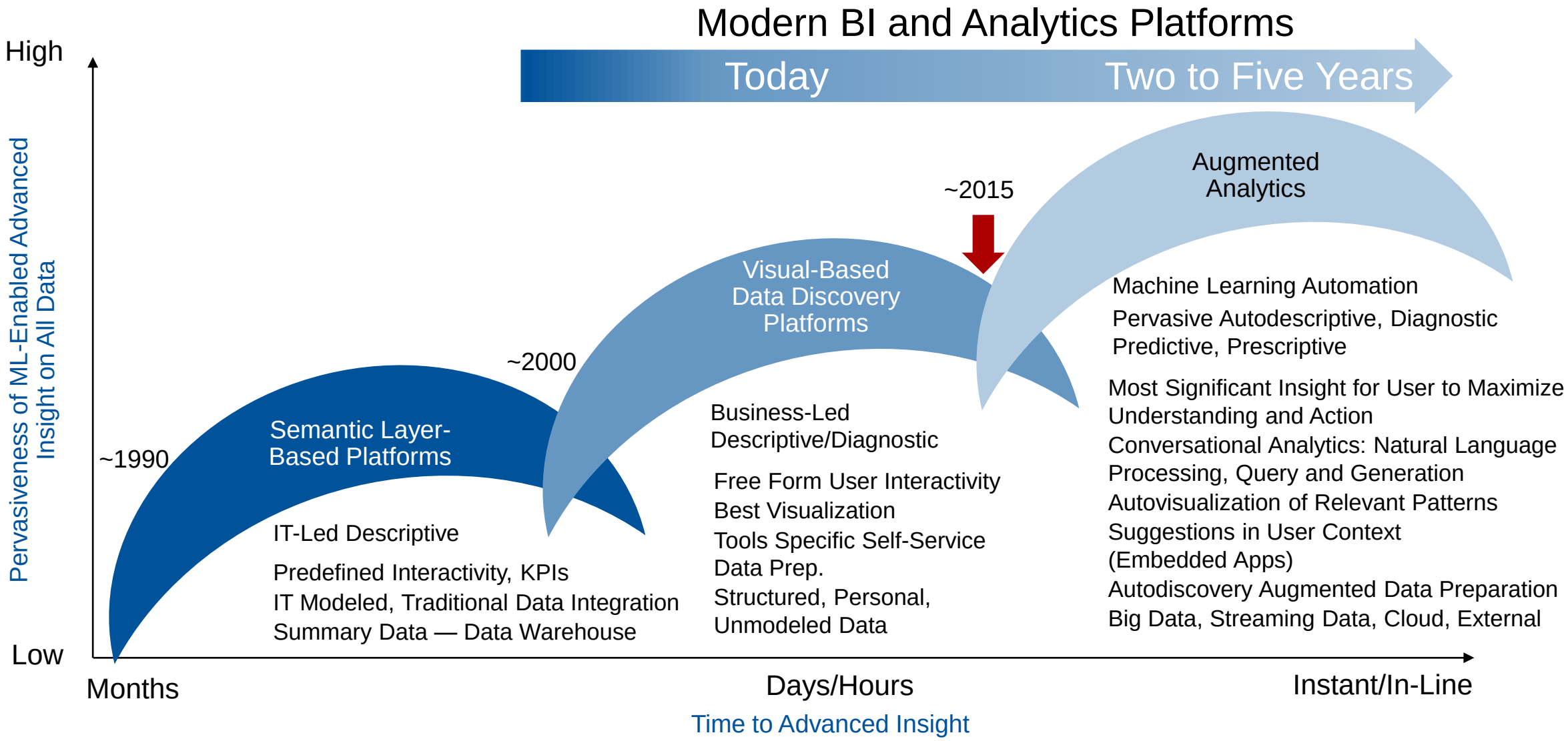
The Emergence of Augmented Analytics



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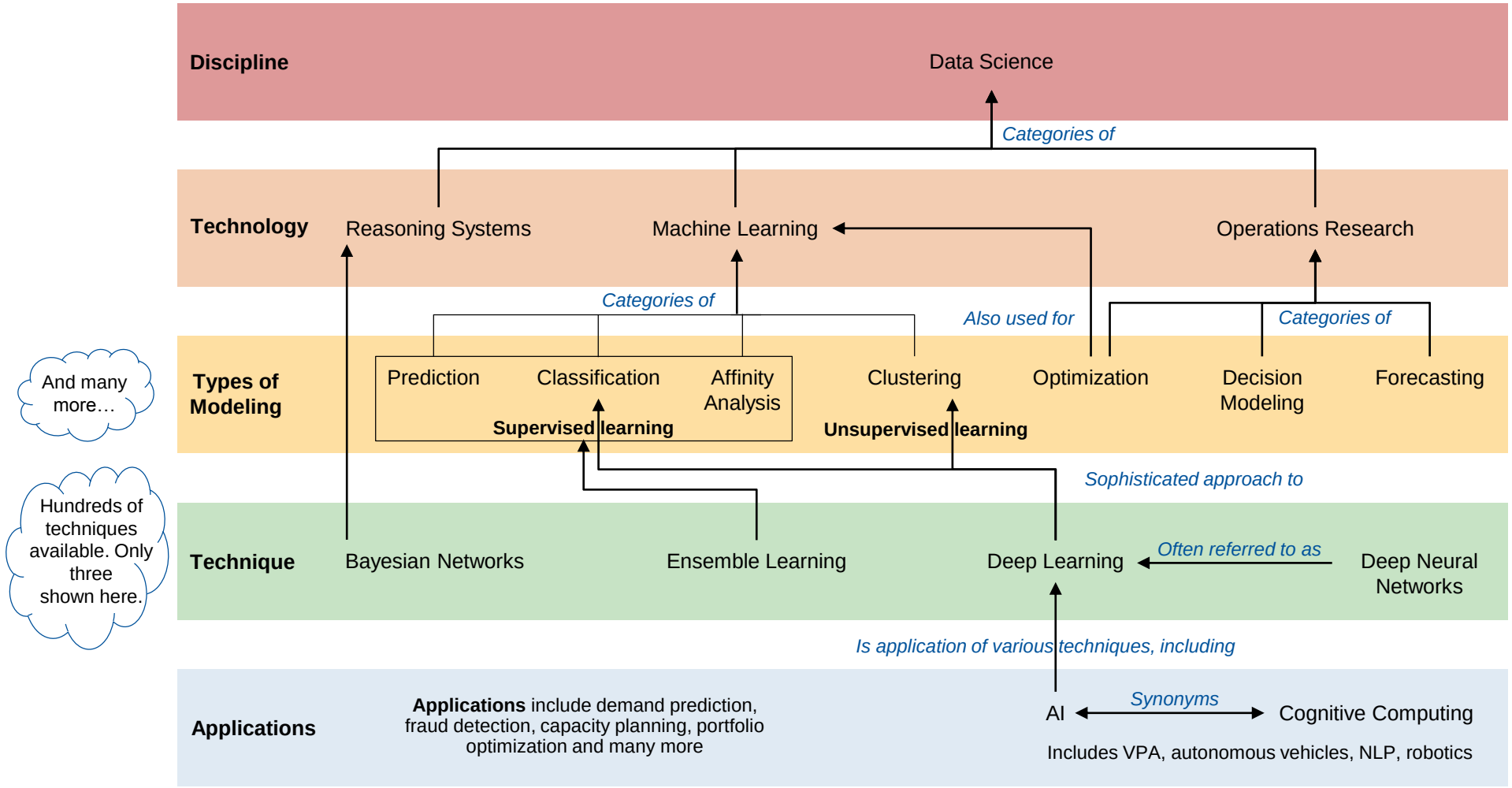
Understanding the Landscape of Data Science



AI = artificial intelligence; NLP = natural-language processing; VPA = virtual personal assistant
Source: Gartner (July 2017)

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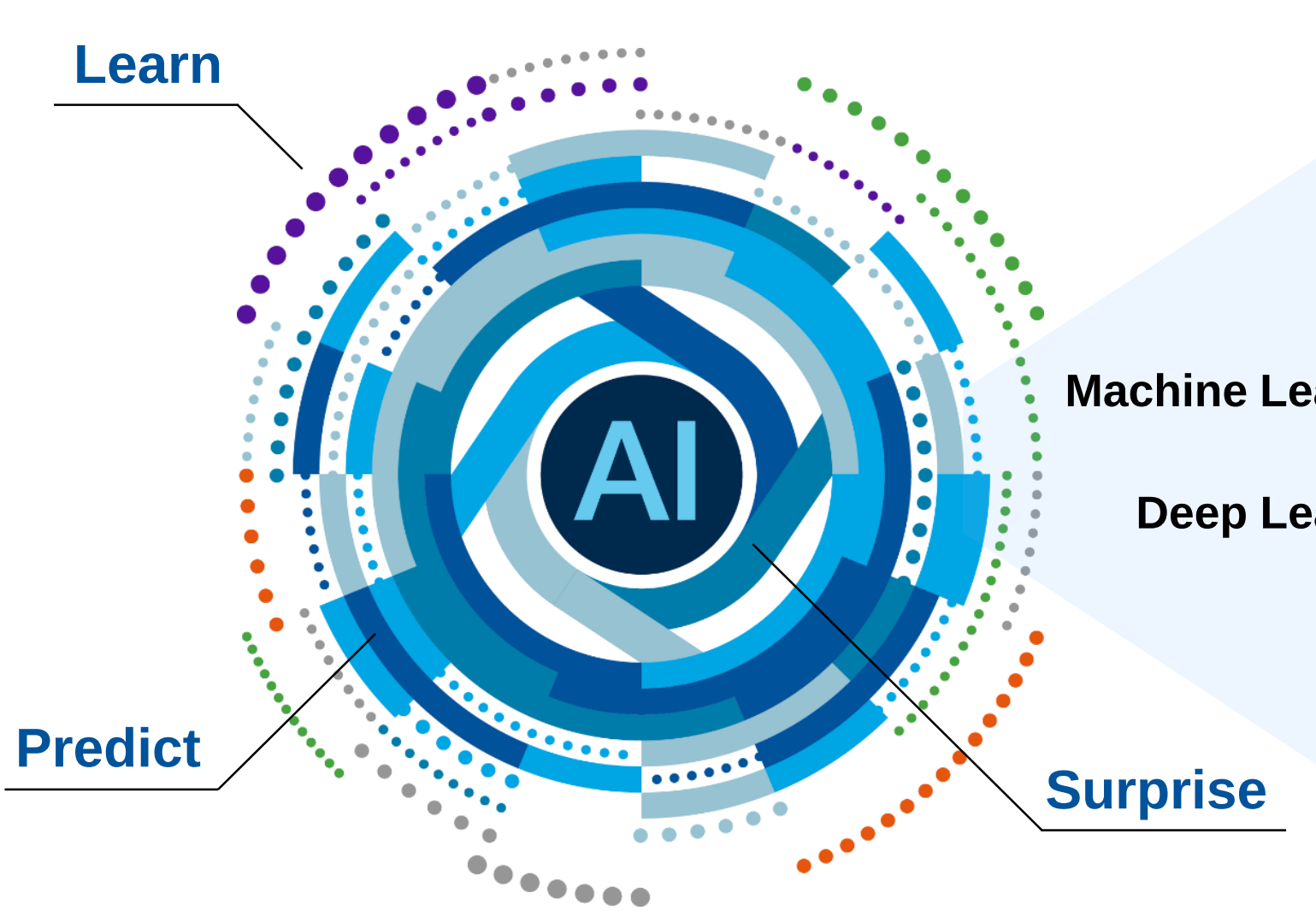
Rapidly Emerging Artificial Intelligence Capabilities



Machine Learning

Deep Learning

AI Capabilities

- Natural Language Processing/Speech
- Computer Vision
- Robotics
- Autonomous Vehicles
- Conversational AI Platforms
- Image and Video Recognition

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Emerging AI Use Cases for Intelligent Automation

More Adoption Today

Less Adoption Today

Use Case	What?		Example	Value Driver
Decision-Making	**Learning systems that use data mining and pattern recognition across huge amount of data to produce insights, provide personalization, predict events and make probabilistic recommendations. Algorithms learn and adapt from new data to become better and more accurate over time.**		▪ Automate high volume expert decisions ▪ **Fraud detection** ▪ Customer churn ▪ **Predictive maintenance** ▪ **Credit risk** ▪ **Sentiment analysis** ▪ **Recommendation/Personalization engines** ▪ Dynamic pricing ▪ Forecasting costs, revenues ▪ **Anomaly/Tumor detection in healthcare**	▪ Better decisions ▪ Reduce costs ▪ Increase revenues ▪ Reduce risks
Virtual Agents	**Chatbots that use text or voice to communicate with users in natural language. Understands language, not just commands, and continuously gets smarter as it learns from conversations it has with people.**	Personal	▪ **Virtual personal assistants (VPA): calendar management; vacation planner; smartphone messaging apps and apps powered by Siri, Alexa, Cortana**	▪ Increase productivity ▪ Novelty ▪ Ease of use
		Corporate	▪ **Call center virtual agents** ▪ **Technical support agents** ▪ **Recruitment agents** ▪ **Robo-financial advisors**	▪ Increase productivity ▪ Scale up expertise ▪ Improve customer experience ▪ Reduce costs
Process Optimization	AI technologies to automate tasks or optimize business processes internal to an organization.		▪ Process handwritten forms or images ▪ Translating voice to text and vice versa ▪ Automating large volume of routine work ▪ Make decisions on approval, routing, next steps and other workflow	▪ Increase productivity ▪ Scale up expertise ▪ Reduce costs
Product Intelligence	Embed AI technologies in a product to make it smarter; learns about its owners and their preferences to hyper-personalize the experience.	Corporate	▪ Enterprise applications ▪ Printers ▪ Buildings ▪ Elevators ▪ Cameras ▪ Smart pens/paper	▪ New business opportunity ▪ Increase productivity ▪ Customer experience ▪ Ease of use
		Consumer	▪ Home appliances ▪ Toys ▪ Thermostats	▪ Novelty ▪ Ease of use ▪ Reduce costs
Robotics	Mechanical equipment with artificial intelligence that can learn from its environment and its experience.	Industrial	▪ Drones ▪ Autonomous trucks ▪ Factory robots ▪ Warehouse automation robots	▪ Increase productivity ▪ Scale up expertise ▪ Reduce costs
		Consumer	▪ Hospital concierge ▪ Hotel receptionist ▪ Robotic caregiver ▪ Self-driving cars	▪ Increase productivity ▪ Scale up expertise ▪ Novelty ▪ Convenience

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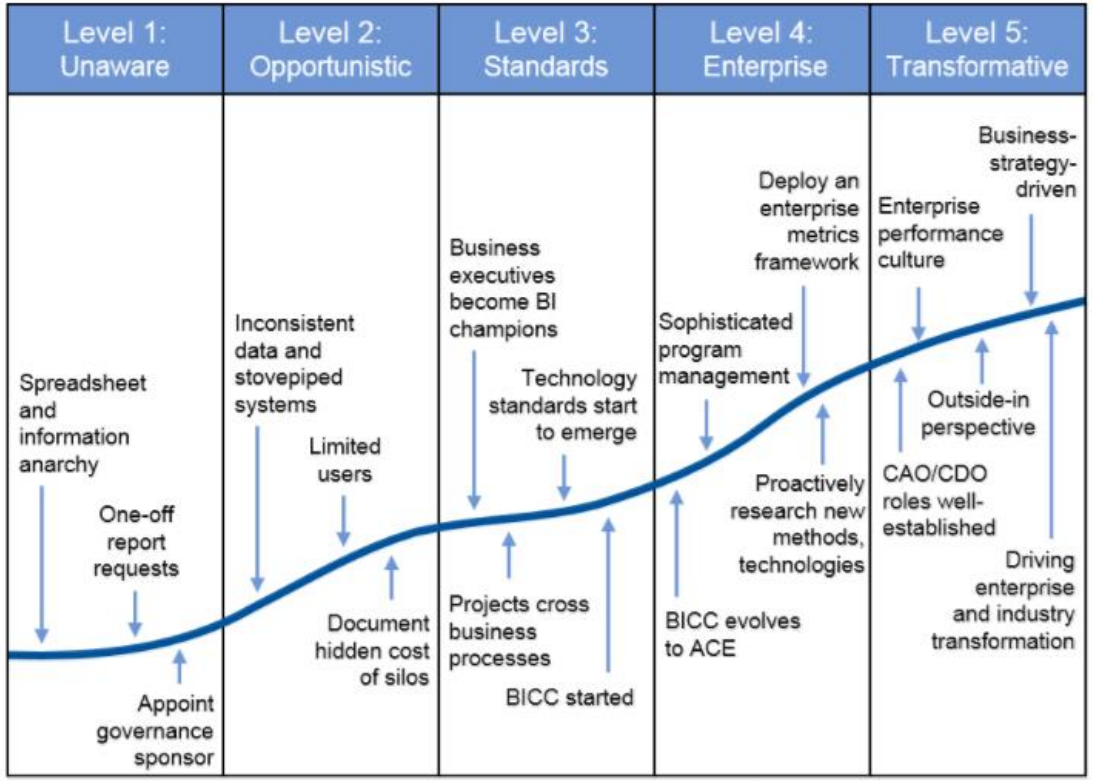
IT Score: BI and Analytics (Maturity Model and Stages)

Figure 1. BI and Analytics Maturity Model



BI = business intelligence; BICC = business intelligence competency center; CAO = chief analytics officer; CFO = chief financial officer; COO = chief operating officer

Source: Gartner (October 2016)

The five levels of maturity are:

- **Level 1: Unaware** — BI capabilities are largely spreadsheet-based analyses and personal data extracts.
- **Level 2: Opportunistic** — Individual business units pursue their own BI and analytics initiatives.
- **Level 3: Standards** — The organization begins to move to shared services, technology standards, common data models and some performance alignment.
- **Level 4: Enterprise** — The organization is performance-oriented with an enterprise metrics framework providing alignment, and the roles of the chief data officer (CDO) and chief analytics officer (CAO) lead analytics efforts across the organization.
- **Level 5: Transformative** — BI and analytics are used externally with partners and suppliers, with technology platforms that allow for agility and greater use of predictive and prescriptive analytics.

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IT Score: BI and Analytics (Characteristics)

Table 1. Characteristics Within Each Maturity Level

	Level 1: Unaware	Level 2: Opportunistic	Level 3: Standards	Level 4: Enterprise	Level 5: Transformative
Business Drivers	▪ "CxO wants to know…"	▪ Single business function	▪ Multiple business functions	▪ Enterprise	▪ Cross-enterprise and cross-industry
Performance Measures	▪ Undefined	▪ Single function ▪ Process optimization	▪ Cross-functional ▪ Process analysis and management	▪ Enterprise performance metrics and management framework	▪ Leading enterprise and industry performance measures
People and Culture	▪ Data analysts and Excel power users ▪ Gut-feel decision making	▪ Functional managers and analysts ▪ Knowledge in the hands of a few	▪ Executives, functional managers, analysts ▪ Fact-based decision making valued	▪ Executives, functional managers, analysts, front-line workers, all decision makers ▪ Fact-based decision making encouraged	▪ Customers, suppliers, partners ▪ Fact-based decision making assumed, negative results accepted rather than hidden
Processes	▪ Undefined and uncontrolled ▪ No formal BI training	▪ Silos ▪ Backlog of reporting requests (reactive) ▪ Limited classroom training on tools	▪ Shared, integrated ▪ Governance ▪ Primarily waterfall development, some agile ▪ Training on tools and data	▪ Well-defined, architected and governed (adaptive) ▪ Balance risk and opportunity ▪ Agile ▪ Myriad training approaches	▪ Inside-out and outside-in focus ▪ The digital enterprise
Platforms and Technology	▪ Disparate ERP systems ▪ Spreadsheets	▪ Packaged or embedded, silos ▪ Custom ETL	▪ Standards, multiple applications, tools	▪ Consistent, integrated ERP system	▪ Interconnected information, process and analytics services across the value chain
	▪ Canned reports in transactional systems	▪ Reporting-oriented, ad hoc query, tools, OLAP (limited)	▪ Robust data integration, MDM, data quality ▪ Dashboards ▪ Data discovery complements reporting tools	▪ Multitier, multigeography hub-and-spoke architecture ▪ Logical data warehouse, data virtualization and Hadoop-based platforms ▪ Self-service data preparation ▪ Advanced analytics	▪ Pervasive data discovery and data preparation ▪ Real-time data feeds ▪ Embedded analytics ▪ Innovation lab ▪ Use of cloud ▪ Analytics ecosystem
Program Management	▪ None	▪ Application- and project-focused	▪ BICC	▪ ACE ▪ Enterprise architecture ▪ Hybrid centralized, decentralized delivery	▪ Strategic business initiative ▪ Value-based prioritization

ACE = analytics center of excellence; BICC = business intelligence competency center; ERP = enterprise resource planning; ETL = extraction, transformation and loading; MDM = master data management; OLAP = online analytical processing

Source: Gartner (October 2016)

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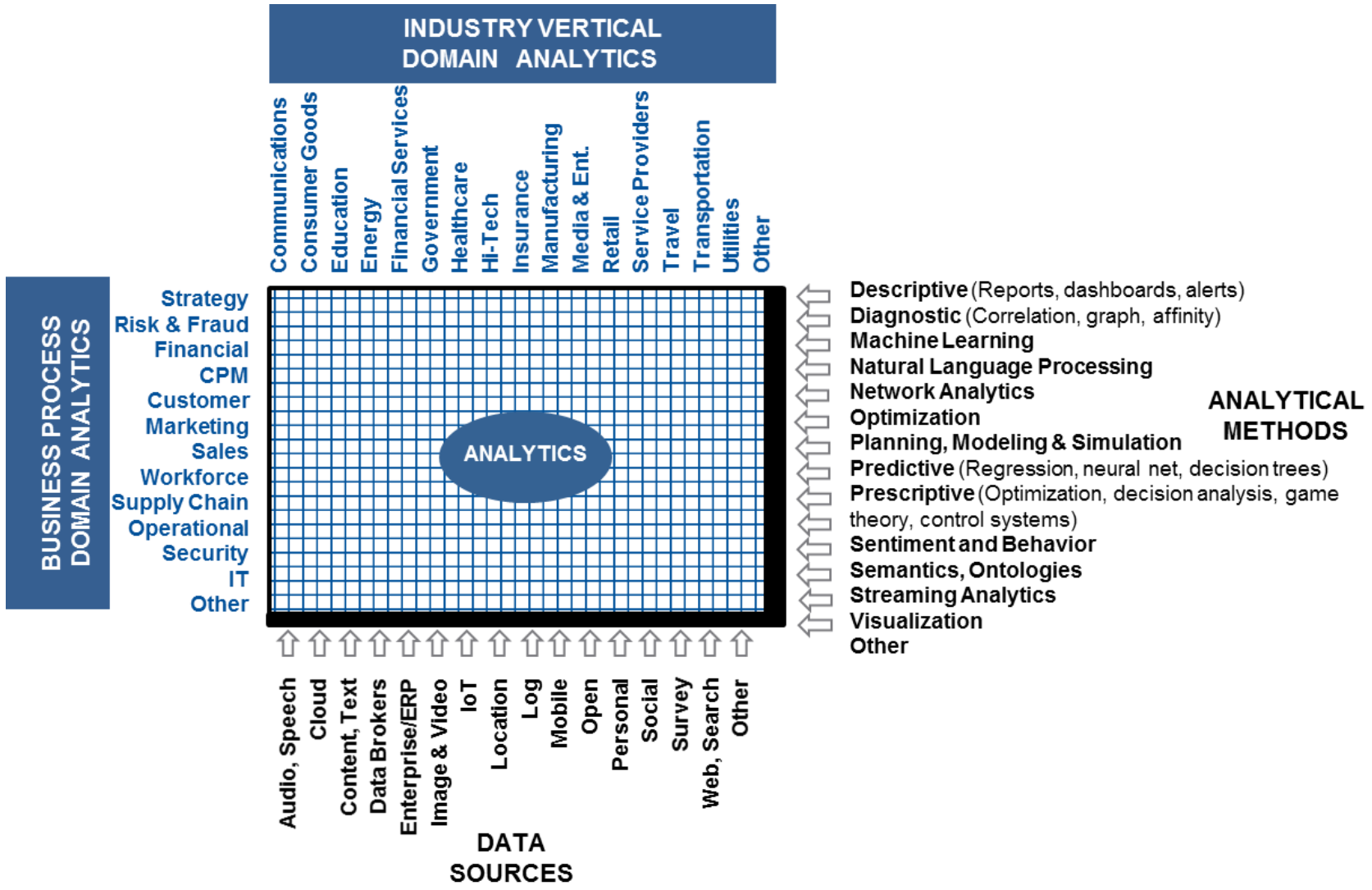
Domain Analytics Model



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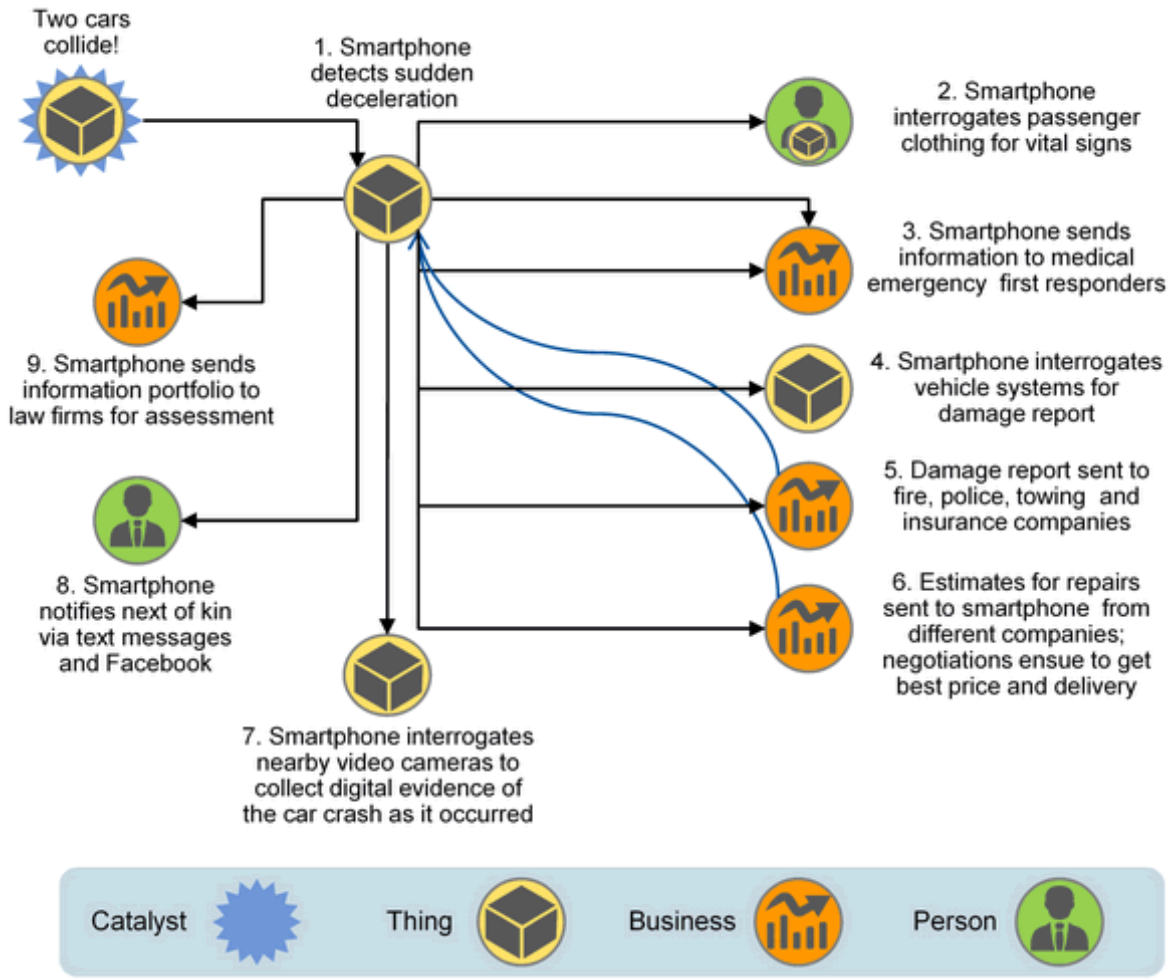
Imagine this Business Moment: A Car Crash

Car Crash Business Moment Scenario: The Smartphone Is the First Responder

Source: Creative Commons image courtesy of Jeffrey Beall on Flickr



Imagine this Business Moment: A Car Crash

Car Crash Business Moment Scenario: The Smartphone Is the First Responder

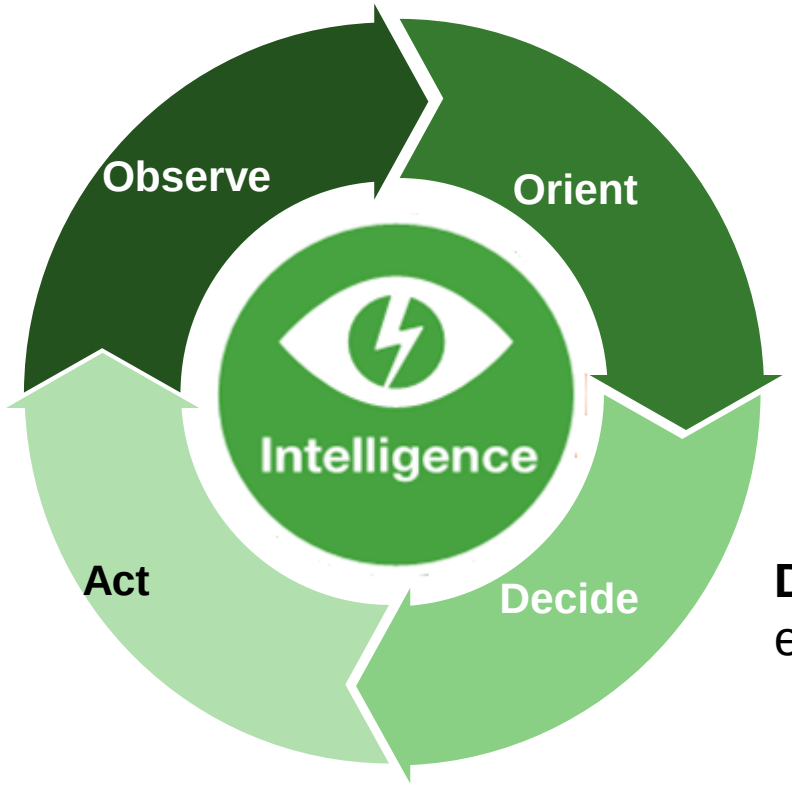
Source: Creative Commons image courtesy of Jeffrey Beall on Flickr

Industry	Information Flow	Critical Infrastructure, Business Process or Technology Requirements
Consumer electronics	▪ Acquires sensor, video camera and other data, and sends to relevant actors ▪ Receives, analyzes and responds to bids and offers using local or cloud resources	▪ Smartphone and VPA technologies ▪ Smart apps for managing emergencies and communications channels
Government	▪ Negotiates, determines and mandates standardized data and communications protocols	▪ Emergency management data and communications standards ▪ Smart emergency management processes ▪ Video camera access protocols
Healthcare	▪ Receives initial and updated medical information, and communicates treatment advice to first responders	▪ Medical data standards ▪ Communications protocols
Financial services	▪ Receives initial insurance claims information, sends update requests and transmits a final appraisal	▪ Smart claims processing and negotiation services and processes
Automotive	▪ Provides status data on inquiry	▪ Operational and damage sensors
Retailers	▪ Smart clothing provides status data on inquiry ▪ Towing and repair companies receive and analyze auto data from the smartphone, and return repair estimates	▪ Smart clothing sensors ▪ Smart auto repair estimation and negotiation services and processes
Legal	▪ Receives and analyzes information from the smartphone, and sends a final assessment	▪ Smart initial assessment and prioritization or routing capabilities

What is Needed to Realize Such D&A Capabilities?

People (skills, program, change mgmt.)

Data (management, governance, feedback, context)



Business process (context, dependency)

Execution (effectiveness, application)

Decision (modeling, evaluation)

Analytic (insight, analysis)

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3 Leading Practices in Organizational Structures

- **Creating an Office of the CDO**
  - Focused on innovation, orchestration and execution
  - Direct and matrix organization
  - Scope: Enterprise or Business Unit; “Information Management + Analytics” Charter
- **Shifting from a Centralized BICC to a Hybrid Analytics CoE (center or community of excellence)**
  - Strong, lean core team with business analysis, data management, data science, program management strengths
  - Enabling self-service/citizen community model
  - Supports rotation opportunities for retention and development
  - Aligned with bimodal design
- **Adopting a Bimodal Approach**
  - Mode 1: Run/Manage the Core
  - Mode 2: Innovate/explore
  - Intentionally carve off capacity (people and infrastructure) for each

Roles of the 21st Century *Data-Driven* Organization

10 Key Roles to Focus on Now:

- Chief data officer (CDO)
- Chief analytics officer (CAO)
- Facilitator
- Business process analyst
- Data scientist
- Data engineer
- Information architect
- Lead information steward and information stewards
- Master data management (MDM) program manager

Additional Roles to Watch for:

- Citizen Data Scientist
- Information Strategist
- Information Product Manager
- Information Asset Manager
- Data Custodian, Curator
- Artificial Intelligence & Machine-Learning Specific Roles
- Storyteller, Translator, Interpreter

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Analytics Center of Excellence(CoE): 5 Key Capability Areas

Beyond the technology or report-writing focus of most BICCs, your ACE should encompass (or at least address) a variety of five key capability types:

- **Organization capabilities** — Defining and enabling required roles and responsibilities, and influencing culture.
- **Project capabilities** — Performing management and administrative activities, and gauging project performance.
- **Data capabilities** — Identifying information sources and delivering some central analytics.
- **Education capabilities** — Fostering innovation and self-service enablement along with related knowledge management activities.
- **Technology capabilities** — Establishing tool and architecture standards.

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Key Research Notes

Leadership, Vision & Role of CDO

- Leadership Vision for 2018: Data and Analytics Leader
- No Data and Analytics Vision? No Business Impact!
- Survey Analysis: Third Gartner CDO Survey — How Chief Data Officers Are Driving Business Impact

Strategy & Maturity Assessment

- Use the Gartner Data and Analytics Compass to Drive Strategy
- ITScore for Data and Analytics
- Toolkit: Best of ... Data and Analytics Strategies
- Modern Data Management Requires a Balance Between Collecting Data and Connecting to Data

Organization: Roles, Structures & Data Literacy

- Must-Have Roles for Data and Analytics, 2017
- The 30 Capabilities That Your Analytics Center of Excellence May Be Lacking
- Fostering Data Literacy and Information as a Second Language: A Gartner Trend Insight Report

Examples, Use Cases

- Toolkit: Analytics Business Opportunities From Almost 200 Use Cases

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APPENDIX:
Higher-Ed Examples, Research

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Gartner's Library of Hundreds of Real-World Examples:
Excerpts available upon Request from Analysts!

Using Stores of Data to Improve Forecasting

n electronics and

ЭЛЬДОРАДО
Так просто жить лучше

Refining the Need for Equipment Maintenance

- Opportunity:
  - Reduce refinery issues and unplanned maintenance.
- Data and analytics:
  - Monitors water level, pressure, temperature, flow, PH, conductivity and turbidity.
  - Chemical analysis to calculate cooling tower efficiency.
  - Vibration monitoring of the motors, reduction mechanisms and pumps.
- Results:
  - A shift from unplanned to preventative maintenance.
  - Reduced refinery downtime and saves 960 hours per year in manual monitoring per refinery.

PEMEX

ng and Engaging Your Customers Better

umber of customer to ensure their satisfaction and retention.

Westpac

regularly

Squeezing Every Drop of Data

- Opportunity:
  - Inconsistencies in orange juice due to variations in orange crop, sourcing and seasonality.
- Data and analytics:
  - "Black Book" model algorithm developed by Revenue Analytics crunches data from up to one quintillion data points including satellite images, weather, expected crop yields, cost pressures, regional preferences and detailed data about the 600 flavors that comprise an orange, plus variables such as acidity and sweetness.
- Results:
  - Precise dynamic formula for how to blend orange juice for consistent taste, including pulp content, for its $2B orange juice business.
  - After a hurricane or freeze, it can replan the business in 5 to 10 minutes.

Coca-Cola

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Art of the Possible™

Course matching makes the grade

- Opportunity
  - Predict student/applicant success rate & suitability for courses
- Data and Analytics
  - For current students, used IBM SPSS on classroom, job & achievement data to predict if students would face problems
  - For new applicants, their particulars were matched with course requirements/curriculum to assess their suitability
- Results
  - This lead to fuller courses and greater student success; in turn created higher revenues for college
  - The accuracy increased from 82% to 96% in identifying “high-yield” prospects, while also saving cost of hiring external analysts

WICHITA STATE UNIVERSITY

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University of Kentucky

Challenge

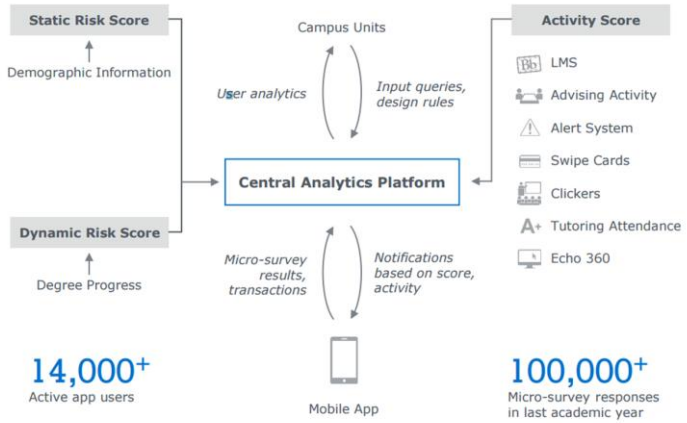
- Need to improve student retention & completion
- 6 yr grad rate was 60% in 2012
- Started in 2012

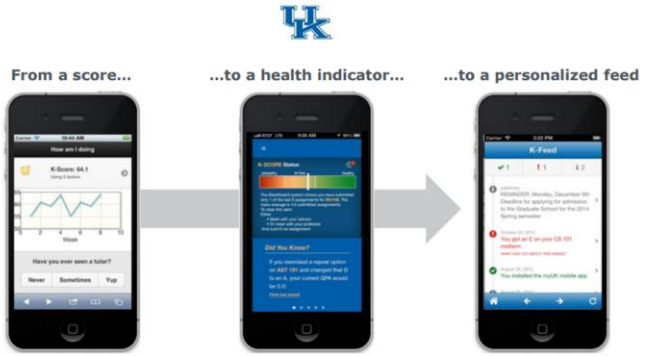
Tools, Technologies & Approach

- SAP
- Combined IR & BI teams
- Created an activity-based K-score for students

Results

- 6 year grad rate increased slightly





NOTTINGHAM TRENT UNIVERSITY LEARNING ANALYTICS

- Opportunity
  - Retention & completion
  - Take positive steps to identify students who were disengaging from their studies and provide timely support that might help them continue with their studies.
- Data and Analytics
  - Student Retention, Engagement and Monitoring (StREAM) Packaged analytics from DTP Solutionpath, using wide array of data eg library, network etc
  - HP Intelligent Operating Layer (IDOL). IDOL is a Big Data analytics platform
- Results
  - StREAM accurately predicted around 90 per cent of students who had withdrawn. Live pilot programme involving 800 students across a range of courses.
  - Implemented for all students at the beginning of the 2014/15 academic year

Solutionpath
A DTP COMPANY

Gartner

Arizona State University

Challenge

- Retention, graduation and efficiency

Tools, Technologies & Approach

- Combined a range of tools to address issues via advanced analytics platform inc. Hadoop, Splunk, College Scheduler etc
- Trying to do more with predictive analytics & visualization

Results

- Graduation rate up 20%
- $7.3 million in advising savings

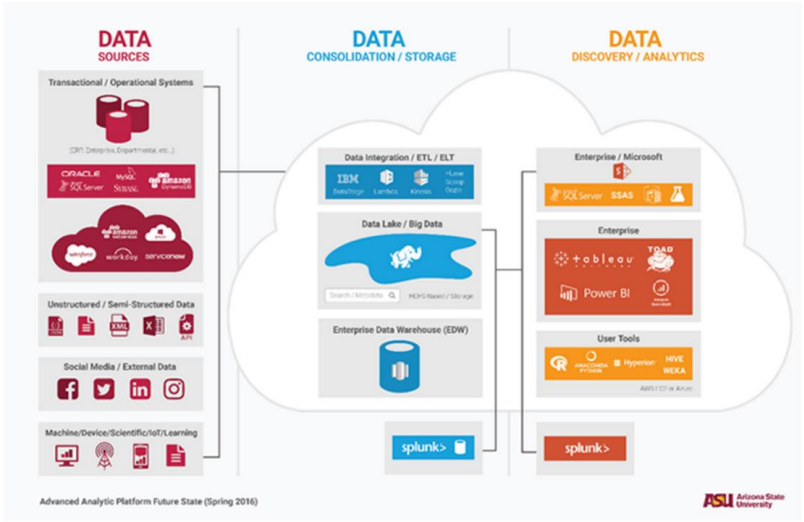


Figure 3. Advanced analytics platform plan

Facing the challenge of improved attention

- Opportunity
  - Ensure that the students remain interested in the classroom lessons
- Data and Analytics
  - Real-time facial expression analysis of camera feed of each student by SensorStar's EngageSense system
  - An automated metric of student engagement shows at what points they became confused or distracted
- Results (TBA)
  - The objective is to achieve better teaching, since teacher would know the improvement points precisely
  - However, a real-world piloting is yet to take place to testify the purpose

Studying Students

- Opportunity
  - Leveraging the creative, social, experimental nature of college students to inspire the future of products, services and experiences
- Data and Analytics
  - Specially designed student rental housing that tracks residents' physical, health, purchasing, consumption, financial, school, social, media, etc. behaviors on 500 students at U of Illinois.
  - Evaluative and predictive analytics along with "quantitative anthropology" synthesizing data into actionable understanding, meaning and insights.
- Results (opening Aug 2015)
  - Giving major brands a window into this influential segment of the population to validate directions, advance marketing, and fuel innovation.

HERE.
INSIGHTS TO LIFE

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University of Nevada Las Vegas

Challenge

- Student success

Tools, Technologies & Approach

- Data mining of LMS clickstream using Splunk to identify students at risk of not getting a passing grade

Results

- Up to 33% getting A & B grades
- Lower class drop out rates
- Still small scale

University of South Florida

Challenge

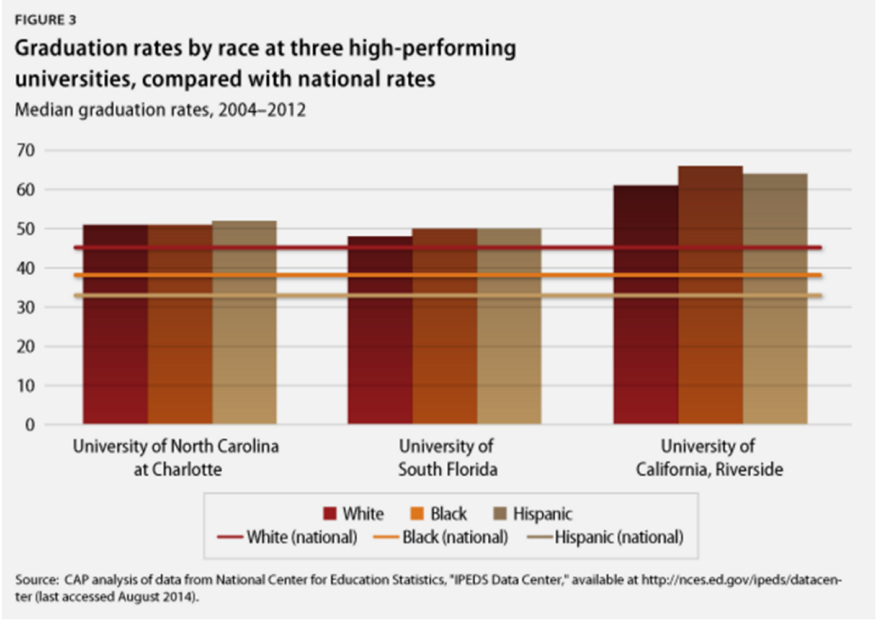
- Focus on retention & graduation
- 6 yr grad rate was 52% in 2010
- 1st yr retention was 81%

Tools, Technologies & Approach

- Civitas Learning & homegrown advising system coupled with organizational changes & interventions

Results

- 1st year retention 89.97%, 6 yr grad 68%



CIVITAS LEARNING

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Recommended Gartner Research (Higher-Ed)

- **Industry Vision: The Fluid University Will Succeed in the Digital Business Era**
  Terri-Lynn B. Thayer (G00294487)
- **Assessing the State of Institutional Analytics in Higher Education**
  Terri-Lynn B. Thayer (G00277044)
- **Three Important Ways the Analytics Landscape Is Changing in Higher Education**
  Glenda Morgan | Terri-Lynn B. Thayer (G00300566)
- **How to make the business case for learning analytics**
  Glenda Morgan | Alan D. Duncan (G00295803)