

# Business Motivations and Drivers for Big Data Adoption

Chapter: 02

Instructor: Houssein Dhayne

houssein.dhayne@net.usj.edu.lb



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## Businesses Embrace Tech-Driven Collaboration

- How businesses are treating their structure **similar to technology design**:
- An e-commerce company traditionally operated with a **top-down structure**:
  - **Executives** decided on new product lines
  - **Managers** planned inventory and marketing
  - **Employees** fulfilled orders
- There was little feedback between departments. Executives made decisions solely on experience.

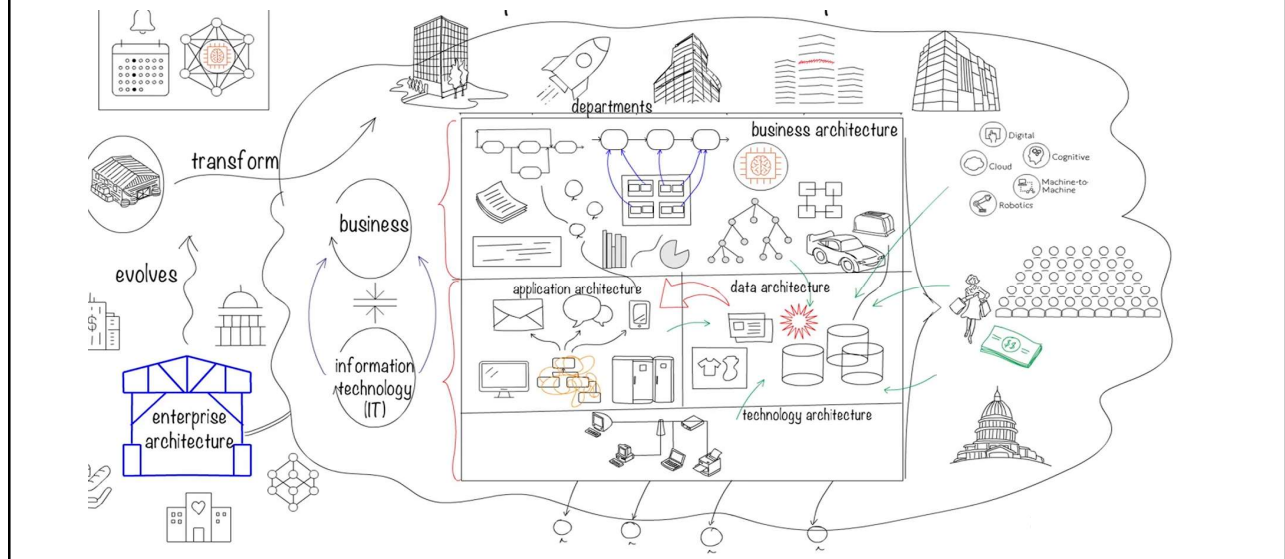


- Now they take a more technological approach:
  - The company implements an inventory management system that **tracks sales and orders in real-time**.
  - **Backend systems integrate customer data** from web, mobile and CRM to form a unified view.
  - **Data flows** between previously siloed departments through interconnected APIs.
  - Executives can now base product line **decisions on analytics of customer behavior** data from the integrated systems.
  - **Managers receive automated alerts** when inventory is running low, since systems track usage.
  - **Employees have visibility into client preferences** and can offer personalized recommendations.

## Introduction - 1

- **Shift in Business Architecture:** Organizations now adopt a business architecture that mirrors their technology architecture, expanding the domain of enterprise architecture to include both business and technology aspects.
- **Importance of External Data:** Recognizing the need to sense external factors influencing profitability, organizations are increasingly relying on external data, often presented as "Big Data" datasets.
- Now businesses are beginning to **design their structure and processes more like how they design their technology infrastructure**. For technology, things are interconnected with feedback loops.

## Introduction - 1



## Introduction - 2

- This chapter discusses the business motivations and drivers behind the adoption of Big Data solutions.
- It highlights the changing perspective in organizations, where business architecture is now considered as important as technology architecture.
- The chapter explores various factors driving Big Data adoption, including marketplace dynamics, business architecture, business process management, information and communications technology, and the Internet of Everything (IoE).

# Marketplace Dynamics



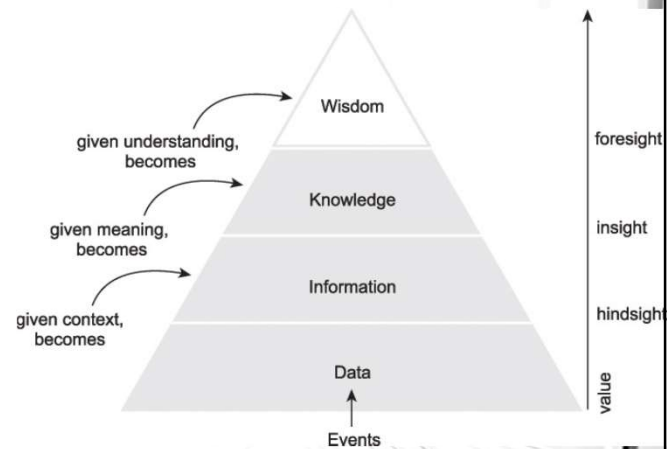
## Marketplace Dynamics

- Two major stock market corrections (dot-com bubble burst in 2000 and the global recession in 2008) led to a focus on efficiency and cost-cutting.
- Post-recession, businesses shifted to innovation, seeking new ways to deliver value and gain a competitive edge.
- Global economies are interconnected, and businesses must expand their Business Intelligence activities beyond internal data to sense the marketplace.
  - leading to the generation of Big Data datasets.



## The DIKW Pyramid

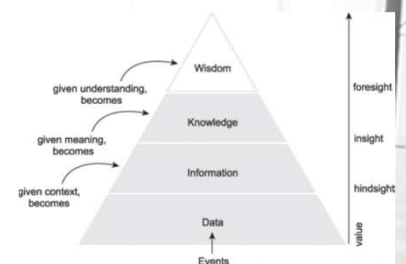
- The **DIKW Pyramid** provides a structured framework, illustrating the progression of information, knowledge, and wisdom.
- **From Hindsight to Foresight:** Big Data facilitates the transition from hindsight to foresight, empowering organizations to anticipate market changes and make proactive decisions.
- By embracing external data sources and leveraging technology alongside human expertise, businesses can navigate this journey effectively



## The DIKW Pyramid -2-

- **Data:** Imagine you have a list of daily sales figures for a store.
- **Information:** By organizing and analyzing the sales figures, you see that sales are higher on weekends. This insight is information.
- **Knowledge:** Understanding that weekends are busier, you decide to schedule more staff on Saturdays and Sundays to handle the increased demand. This decision is based on knowledge.
- **Wisdom:** Over time, you notice that the increased staff on weekends not only handles the higher demand effectively but also improves customer satisfaction and loyalty.

This long-term success is an application of wisdom. The ability to make strategic decisions that positively impact the overall business.



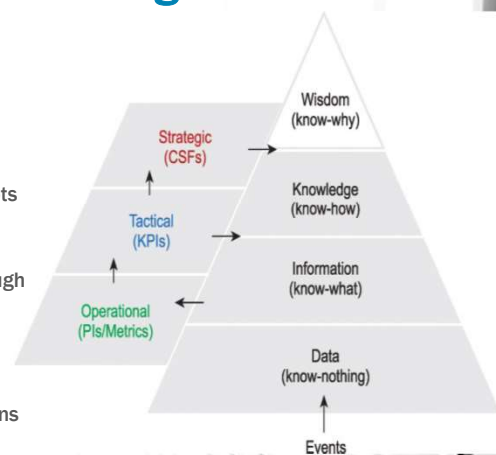
## Business Architecture

- **Business Architecture is like a blueprint** that helps organizations design and align their strategic vision with how they actually operate, involving both technology and human resources.
- It breaks down into three layers: strategic (top level), tactical or managerial (middle level), and operational (bottom level).
- For example, a retailer analyzes data to better understand customer needs and synchronize departments:
  - Sales data informs executives on best product lines (strategic layer)
  - Marketing managers use insights to plan promotions across regions (tactical layer)
  - Store employees receive optimized inventory and can provide personalized service (operational layer)



## Big Data: Enhancing Organizational Insights

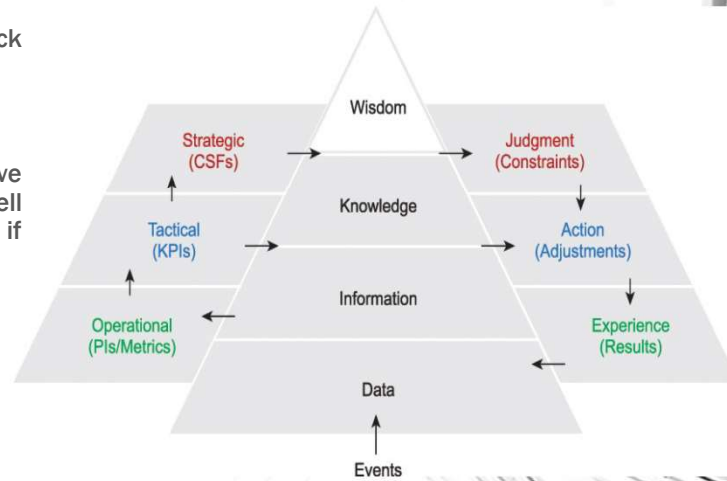
- Big Data is connected to different levels of organizational structure :
- **Operational Level:**
  - At this level, Big Data helps generate metrics that report what's happening in the day-to-day operations of the business.
  - It converts raw data into information by considering business concepts and context relevant to daily tasks.
- **Tactical Level:**
  - Information generated at the operational level is analyzed here through the lens of corporate performance.
  - It provides answers to questions about how the business is currently performing, giving meaning to the information collected.
- **Strategic Level:**
  - Armed with knowledge from the Tactical level, the strategic layer gains insights.
  - This insight helps answer critical questions about whether the current business strategy needs adjustment or adoption for better overall performance.



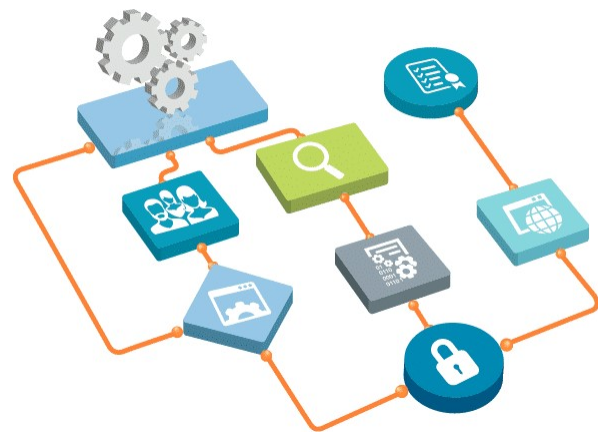


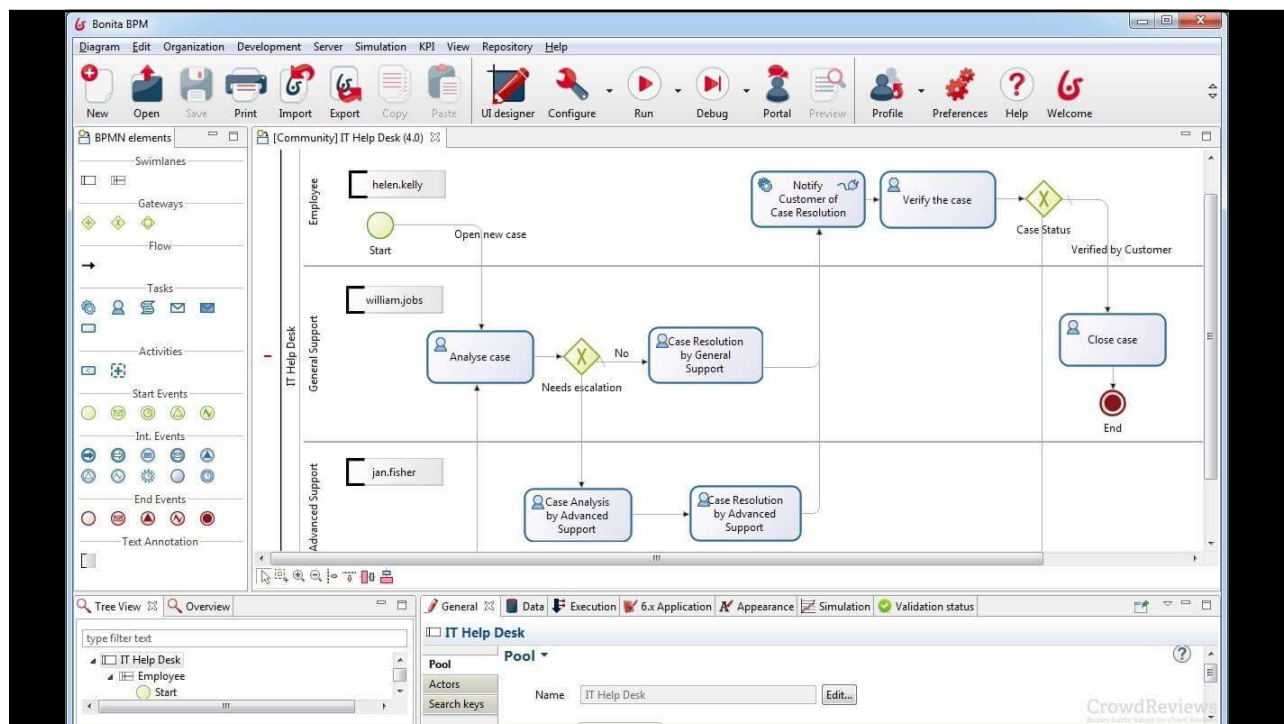
## Alignment with Organizational Layers

- Strong cycle created through feedback loop for alignment.
- This cycle helps the company improve over time. They measure how well they're doing at each level, and if something isn't working, they adjust.



## Business Process Management





## Business Process Management (BPM):

- **Definition:** Business Process Management is a management approach that focuses on aligning all aspects of an organization with the needs and wants of clients.
- **Scope:** It involves understanding, managing, and optimizing business processes to achieve business goals and objectives.
- **Nature:** BPM is a holistic philosophy or strategy aimed at continuous improvement and efficiency in an organization's processes.





## Business Process Management Systems (BPMS):

- **Definition:** Business Process Management Systems are software tools or platforms designed to support BPM by providing solutions for the modeling, execution, and monitoring of business processes.
- **Role:** BPMS facilitates the implementation of BPM strategies by offering a set of tools and features to create, manage, and optimize business processes.
- **Components:** A BPMS typically includes modeling tools for process design, execution engines for running processes, and monitoring tools for tracking process performance.



## BPM and Big Data

- Adaptive Execution with BPM and Big Data is about making business processes smart and flexible. **It's like having a system that learns from data**, continuously refines how tasks are done, and **adapts strategies to achieve better results** in an ever-changing business environment.
- **Example Scenario:**
  - Imagine a customer contact process that initially uses various communication methods (voice call, email, text, postal mail) randomly.
  - Big Data analytics continuously assess the effectiveness of each method based on customer responsiveness.
  - Adaptive execution, guided by these analytics, adjusts the weighting of each communication method. If a particular method proves more effective, it is favored more in real-time.



# Information and Communications Technology



## Information and Communications Technology

- ICT developments have accelerated the adoption of Big Data in businesses, making it more accessible and powerful for organizations of all sizes. Including:
  - **Data Analytics and Data Science:** Businesses analyze lots of data to make operations better and strategic decisions smarter.
  - **Digitization:** Companies use digital ways like online banking and streaming for communication, saving time and cost.
  - **Affordable Technology and Hardware:** Technology getting cheaper lets businesses of all sizes use Big Data, even with basic hardware.
  - **Social Media:** Customer feedback on social media helps companies improve services, increase sales, and create better products.
  - **Hyper-Connected Communities and Devices:** More people and devices connected to the internet create lots of data streams, useful for optimizing various processes.
  - **Cloud Computing:** Renting scalable IT resources from the cloud, helps businesses, big or small, use Big Data without huge upfront costs.



## Data Analytics and Data Science

- Increasing data collection for insights and competitive advantage.
- Convergence of computational approaches, statistical techniques, and data warehousing.
- Maturity of data analytics and data science as foundational elements for Big Data solutions.

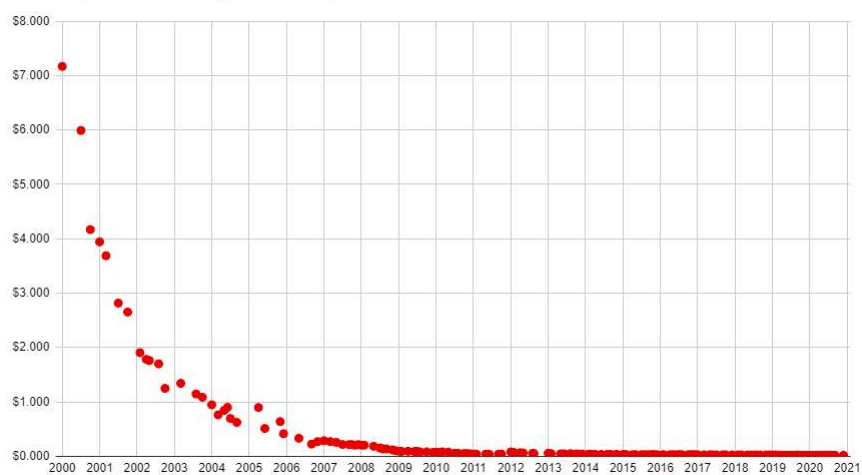
## Digitization

- Transition from physical to digital mediums for communications and delivery.
- Collection of "secondary" data through digital interactions for customized marketing and product optimization.
- Examples of digitization in online banking, on-demand television, and streaming video.

## Affordable Technology and Hardware

- Affordability of technology capable of storing and processing large data sets.
- Use of open-source software on commodity hardware reducing costs.
- Elimination of the competitive advantage traditionally held by large enterprises.

Dollars per GB of storage over time, 2000-2020



**Data storage prices have dropped dramatically**

## Social Media

- Empowerment of customers to provide real-time feedback through public channels.
- Integration of customer interactions from social media into Big Data analysis.
- Recognition of co-creation of product brands and corporate reputation with customers.

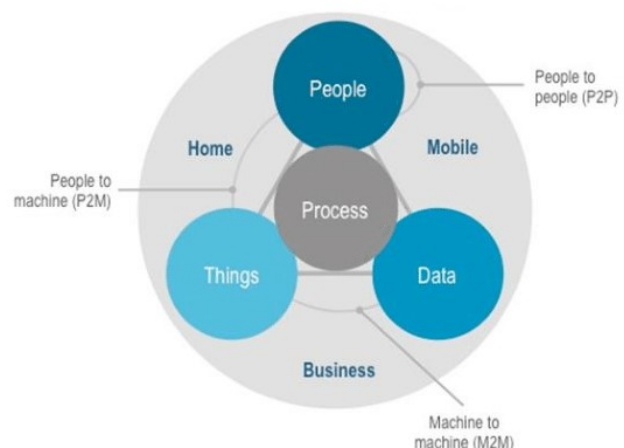
## Hyper-Connected Communities and Devices

- Broadening Internet coverage and proliferation of connected devices.
- Formation of the Internet of Things (IoT) with smart connected devices.
- **Increase in data streams from hyper-connected communities and devices.**

## Cloud Computing

- Highly scalable, on-demand IT resources provided by cloud environments.
- Leverage of cloud infrastructure for building scalable Big Data solutions.
- Reduction of upfront investment in Big Data projects through cloud-based solutions.

## Internet of Everything (IoE)





## Internet of Everything (IoE)

- The Internet of Everything (IoE) combines smart devices from the Internet of Things (IoT) into business processes, using **Big Data to analyze** digitized data from hyper-connected communities and devices.
- Big Data as the core of IoE, providing insights for optimizing processes and creating unique value propositions.

### Example: Precision Agriculture and IoE Benefits:

- Precision agriculture, a prime example of IoE benefits, is transforming traditional farming.
- GPS-controlled tractors, in-field sensors, on-demand watering, fertilization systems, and variable rate seeding maximize field productivity.
- Smart connected farming equipment, coupled with Big Data analysis, contributes to decision support systems.
- In-field sensor data guides farmers and machines to achieve optimum yields.

Overall, IoE applications enhance efficiency, reduce costs, and promote sustainable farming practices.

## Conclusion

- In conclusion, Chapter 2 delves into the dynamic landscape of business technology, highlight the crucial role of Big Data across various domains.
- From Business Architecture to Internet of Everything (IoE), the chapter illustrates how technology, data analytics, and connectivity have evolved to shape modern business practices.
- As we navigate this interconnected era, the cooperation of technology and data continues to be a driving force, enabling businesses to adapt and grow in a rapidly changing landscape.