Data Architectures and Their Potential Impacts on Analytics and Models

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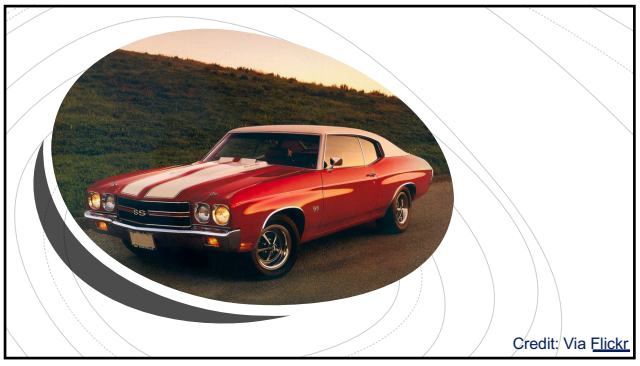

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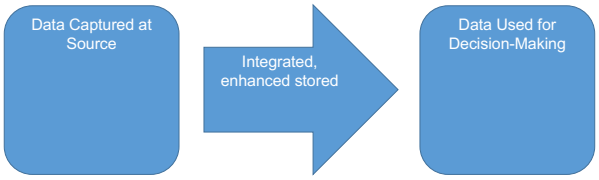
What is Data Architecture

Data architecture guides how the data is collected, integrated, enhanced, stored, and delivered to business people who use it to do their jobs. It helps make data available, accurate, and complete so it can be used for business decision-making.



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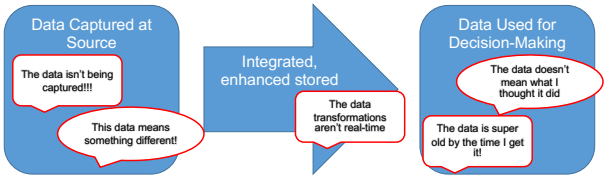

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The Classic

Key Features

- Focused on operational processing
- The rise of relational databases

Key technology limitations

- Data storage was expensive
- Data kept in it's organizational silos
- Optimize processing time

Key challenges:

- Data history not easily available
- Data not very granular or understandable
- same data captured in multiple places, leading to data quality issues

Credit: Via Flickr

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The Roadmaster

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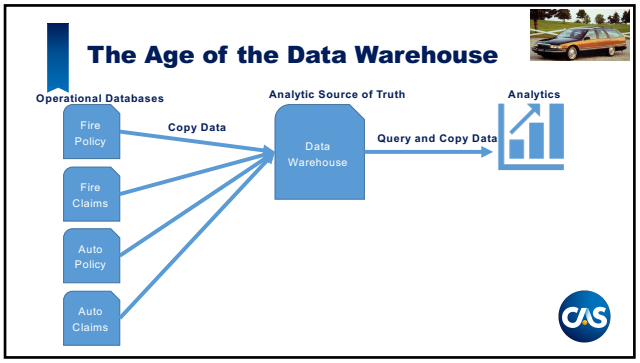
The Age of the Data Warehouse
Operational Databases
Fire Policy
Fire Claims
Auto Policy
Auto Claims
Copy Data
Analytic Source of Truth
Data Warehouse
Query and Copy Data
Analytics

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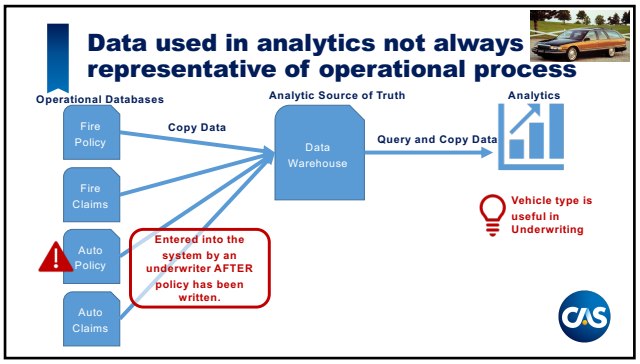
Data used in analytics not always representative of operational process
Operational Databases
Fire Policy
Fire Claims
Auto Policy
Auto Claims
Copy Data
Analytic Source of Truth
Data Warehouse
Query and Copy Data
Analytics
Entered into the system by an underwriter AFTER policy has been written.
Vehicle type is useful in Underwriting

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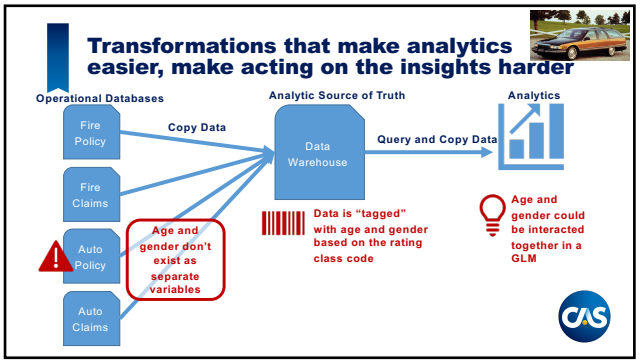
Transformations that make analytics easier, make acting on the insights harder
Operational Databases
Fire Policy
Fire Claims
Auto Policy
Auto Claims
Copy Data
Analytic Source of Truth
Data Warehouse
Query and Copy Data
Analytics
Age and gender don't exist as separate variables
Data is "tagged" with age and gender based on the rating class code
Age and gender could be interacted together in a GLM

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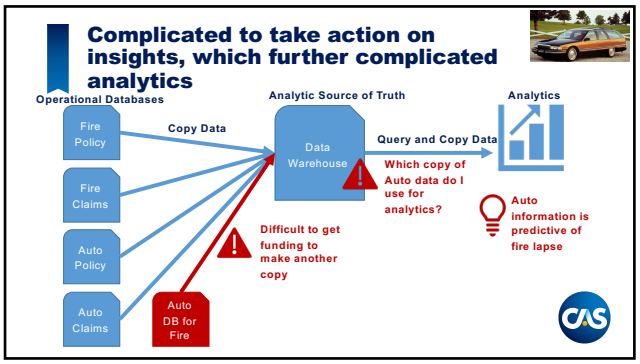
Complicated to take action on insights, which further complicated analytics
Operational Databases
Fire Policy
Fire Claims
Auto Policy
Auto Claims
Copy Data
Analytic Source of Truth
Data Warehouse
Query and Copy Data
Analytics
Which copy of Auto data do I use for analytics?
Auto information is predictive of fire lapse
Difficult to get funding to make another copy
Auto DB for Fire

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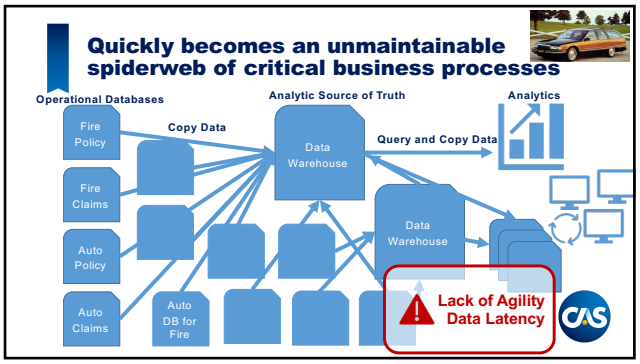
Quickly becomes an unmaintainable spiderweb of critical business processes
Operational Databases
Fire Policy
Fire Claims
Auto Policy
Auto Claims
Copy Data
Analytic Source of Truth
Data Warehouse
Query and Copy Data
Analytics
Data Warehouse
Auto DB for Fire
Lack of Agility
Data Latency

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The TESLA | **Modern Data & Analytic Architecture**

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The **Modern Data Architecture** has emerged as a response to **societal** and **technological** evolution, which make analytics a **value driver** instead of an afterthought.

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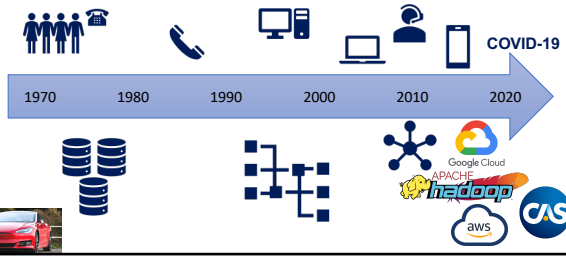
Changes in technology and customer needs have driven the evolution of Data Architecture



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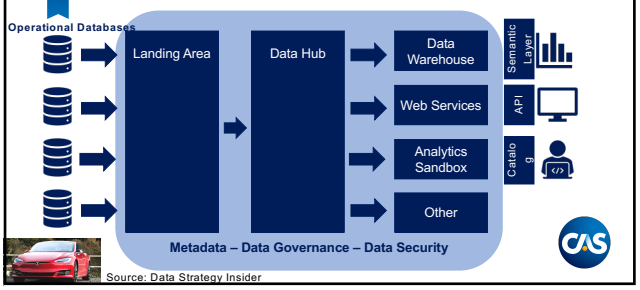
The Modern Data and Analytics Architecture



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Characteristics of the Modern Data Architecture

- ✓Customer-centric
- ✓Adaptable
- ✓Flexible
- ✓Automated
- ✓Collaborative
- ✓Governed
- ✓Elastic
- ✓Secure

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What is your Data Architecture?

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Live Poll: What is your data architecture?

- How old is the data when you get access to it for analytics?
  - Data is refreshed monthly
  - Some data is availably daily, but most is monthly
  - Data is available in real time
- How long does it take to implement a new customer-facing model that needs new data?
  - Years
  - 6-12 Months
  - 1-5 Months
  - <1 Month
- How long does it take to implement a new customer-facing model with existing data?
  - Years
  - 6-12 Months
  - 1-5 Months
  - < 1 Month
- Do you have to translate your data through codes, or is it in clear definitions (e.g. Gender = Male vs. Code = M)
  - Most of the time
  - Sometimes
  - Never

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Tactics based on type of Data Architecture

- Have patience through the complexity
- Advocate for change
- Ask questions to understand

- Understand data differences
- Constrain models to known operational data

- Change the capture paradigm
- Blend operational and analytics
- Learn new languages and tools

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Chief Data Officer Role

- Capital One appointed the first CDO in 2002
- In 2020, 57% of fortune 1000 organizations had a CDO
- Responsibilities Include
  - Governance
  - Operations
  - Innovation
  - Analytics

Get to know the purpose of the Data organization within your company, provide feedback, and share your experiences to help build platform for change.

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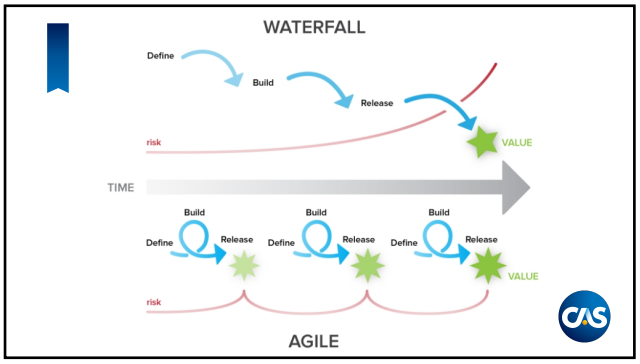

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IT Business Model

Project Management
- Fixed scope projects
- Yearly funding cycle
- Move people to the work
- Less business engagement

Ask for more direct business engagement!

Product Management
- Clear business outcomes
- Persistent, cross functional teams with end-to-end ownership
- Direct business engagement

Connect with teams for data products, and get involved!

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