

Data Visualization using MicroStrategy

Truman Ng, PMP, HCIE



About the Instructor

Truman Ng graduated with Bachelor Degree in Electrical Engineering from NUS in year 2002. He designed Artificial Intelligence (AI) controller for DC-DC Power Convertor by using Fuzzy Logic and Neural Network (NN) as his university Final Year Project.

Truman has over 15 years project experiences across Database & Web Design, PLC machinery, Data Center Design , Structure Cabling System(SCS) and Enterrise Network Design and Implementation. He used to be a network architect for Hewlett Packard, working with a group of virtual team from the US in handling network design and projects in the States.

Truman is the founder of Nexplore (S) Pte Ltd. He provides solutions of Cloud SaaS, IaaS & PaaS and Software Defined Network (SDN), VoIP and Internet Security. He was engaged by Huawei Global Training Center to provide 60+ consultations and trainings for Internet Service Providers(ISP) from Malaysia, Singapore, Brunei, Philipines, Australia, Poland, Iran, South Africa, Swaziland, Cote Divoire, Syria, Uzbekistan, New Zealand and countries over the world.

As achievement, Truman has successfully completed 100+ IT network projects for Bank, Hotel and Factory within 5 years.

Truman is certified in PMP(Project Management Professional), CBP (Certified Bitcoin Professional), Kubernetes (CKA & CKAD), Cisco Professional level Certifications: CCNP, CCIP, CCDP, HP Professional Certification: Ase and Huawei ,Huawei Expert and Professional Certifications: HCIE R&S, HCNP, HCNA Cloud, HCNA Security, etc.

Course Materials



<https://tinyurl.com/microstrategy2024>

Agenda

- Introduction to Data Visualization
- Getting Started with MicroStrategy
- Basic Visualization Techniques
- Advanced Visualization Features

Agenda

- Dashboard Design and Development
- Data Storytelling and Presentation
- Advanced Visualization Techniques
- Building Interactive Dashboards
- Performance Optimization and Scalability

Agenda

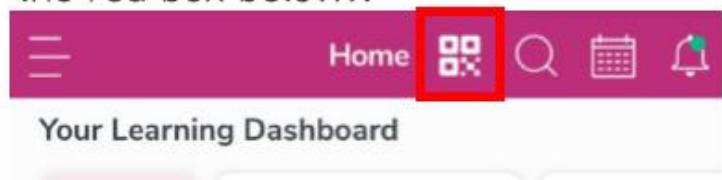
- Introduction to MicroStrategy AI Bot
- Building Dashboards and Reports
- Advanced Visualization Techniques
- Best Practices for Effective Data Visualization
- Use Cases

Scan Your Attendance Using Disprz App

1. Download Disprz App from the App Store or Google Play Store. The app logo below for your reference.



2. Click on “Sign In with Organization account”.
3. Under “Enter Organizational URL”, enter:
<https://maxisacademy.disprz.com>
4. Log in using your Maxis SSO credentials.
5. Once logged in, navigate to the top of your Disprz App homepage and click on the QR code icon (highlighted in the red box below).



6. Scan the QR code displayed to record your attendance.



Ice Breaking Session

- Name
- Job Role
- Hobby
- Expectation

First Day Evaluation

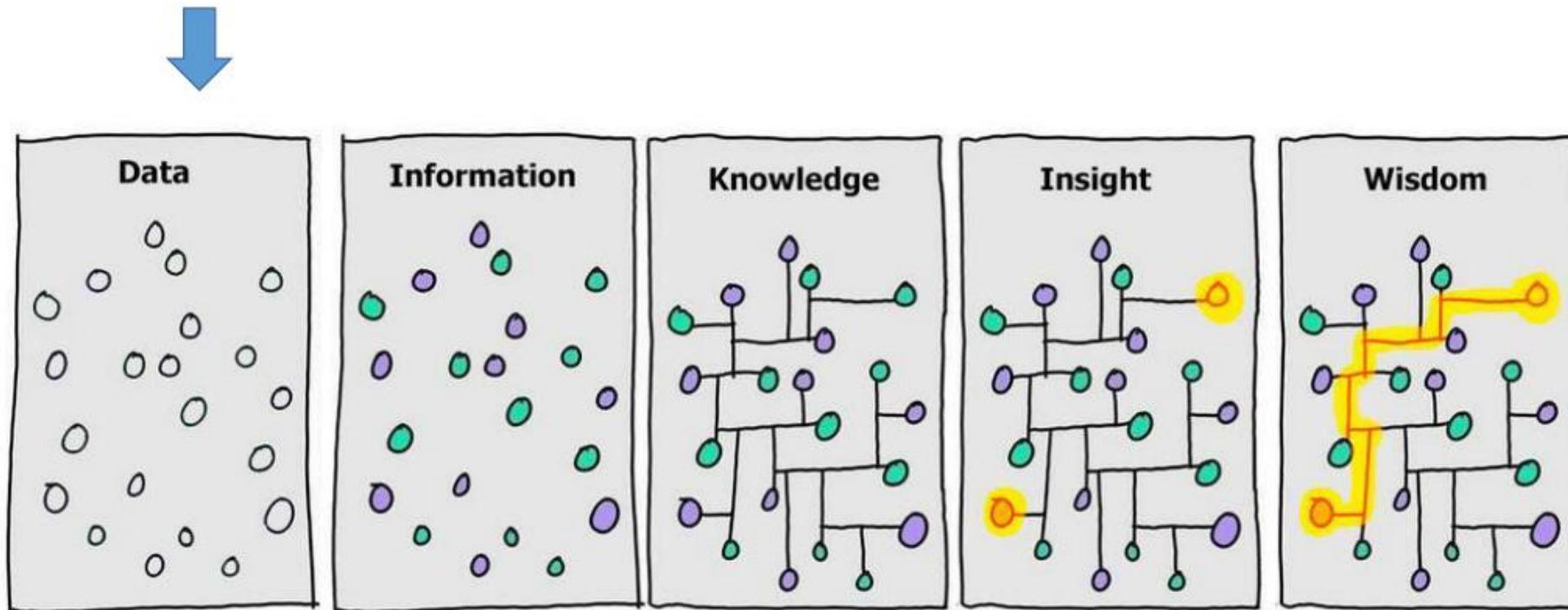
[DVM] Data Visualization using MicroStrategy on 21st Oct 2024 ending 23rd Oct 2024 occurring at Maxis Broadband Sdn Bhd.

The class ID is **50133**. Please provide this class ID to your participants.

The URL for the Online Feedback is <https://feedback.iverson.com.my/ifs>

Introduction

The Information Continuum



Types of Data

Quantitative Data

- Measurable
- Collected through measuring things that have a fixed reality
- Close ended

Qualitative Data

- Descriptive
- Collected through observation, field work, focus groups, interviews, recording or filming conversations
- Open ended

Big Data

Data that is too large or too complex to be managed using traditional data processing, analysis, and storage techniques.



What is Big Data?



- Big Data is a collection of large datasets that cannot be adequately processed using traditional processing techniques. Big data is not only data it has become a complete subject, which involves various tools, techniques and frameworks.



- Big data term describes the volume amount of data both structured and unstructured manner that adapted in day-to-day business environment. It's important that what organizations utilize with these with the data that matters.



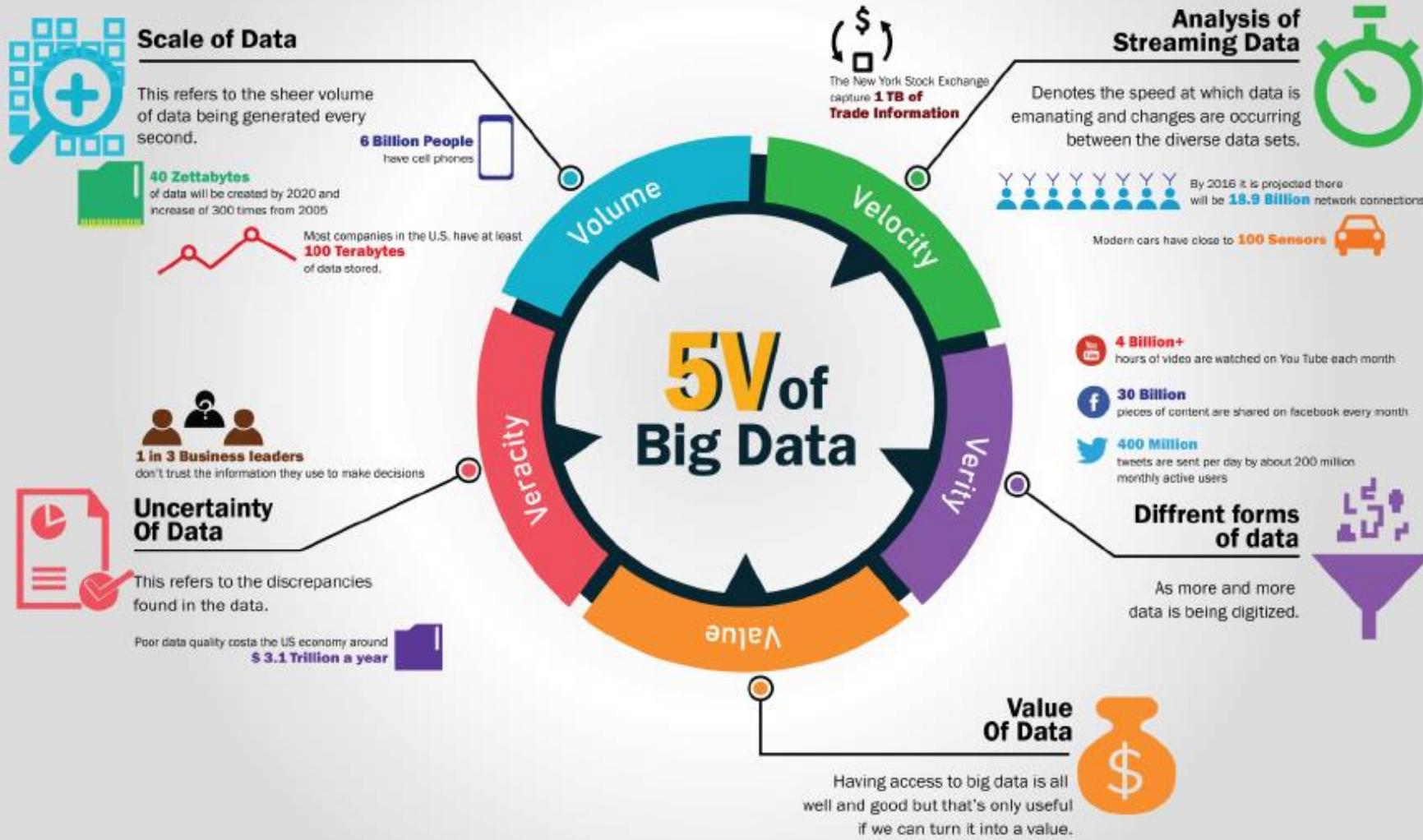
- Big data helps to analyze the in-depth concepts for the better decisions and strategic taken for the development of the organization.

The Evolution of Big Data

The concept of Big Data came into existence in the early 2000s when Industry analyst **Doug Laney** defined big data as the three categories as follows:

- **Volume:** Organizations collects the data from relative sources, which includes business transactions, social media and information from sensor or machine-to-machine data. Before, storage was a big issue but now the advancement of new technologies (such as Hadoop) has reduced the burden.
- **Velocity:** Data streams unparalleled speed of velocity and have improved in timely manner. RFID tags, sensors and smart metering are driving the need to deal with torrents of data in real time operations.
- **Variety:** Data comes in all varieties in form of structured, numeric data in traditional databases to unstructured text documents, email, video, audio, stock ticker data and financial transactions.

The Five V's of Big Data



40 ZETTABYTES

[43 TRILLION GIGABYTES]

of data will be created by 2020, an increase of 300 times from 2005



It's estimated that

2.5 QUINTILLION BYTES

[2.3 TRILLION GIGABYTES]

of data are created each day



Volume SCALE OF DATA



**6 BILLION
PEOPLE**
have cell phones



WORLD POPULATION: 7 BILLION



Most companies in the
U.S. have at least

100 TERABYTES

[100,000 GIGABYTES]

of data stored

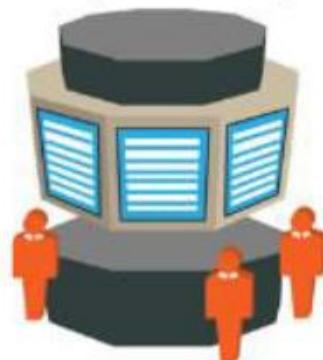
Volume: scale of data

Unit	Value	Size
bit (b)	0 or 1	1/8 of a byte
byte (B)	8 bits	1 byte
kilobyte (KB)	1000^1 bytes	1,000 bytes
megabyte (MB)	1000^2 bytes	1,000,000 bytes
gigabyte (GB)	1000^3 bytes	1,000,000.000 bytes
terabyte (TB)	1000^4 bytes	1,000,000,000,000 bytes
petabyte (PB)	1000^5 bytes	1,000,000,000,000,000 bytes
exabyte (EB)	1000^6 bytes	1,000,000,000,000,000,000 bytes
zettabyte (ZB)	1000^7 bytes	1,000,000,000,000,000,000,000 bytes
yottabyte (YB)	1000^8 bytes	1,000,000,000,000,000,000,000,000 bytes

The New York Stock Exchange captures

1 TB OF TRADE INFORMATION

during each trading session



By 2016, it is projected there will be

18.9 BILLION NETWORK CONNECTIONS

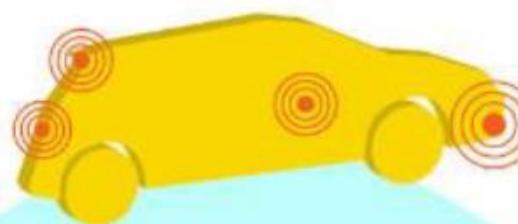
– almost 2.5 connections per person on earth

Velocity ANALYSIS OF STREAMING DATA



Modern cars have close to **100 SENSORS**

that monitor items such as fuel level and tire pressure



As of 2011, the global size of data in healthcare was estimated to be

150 EXABYTES

[161 BILLION GIGABYTES]



30 BILLION PIECES OF CONTENT

are shared on Facebook every month



Variety

DIFFERENT FORMS OF DATA

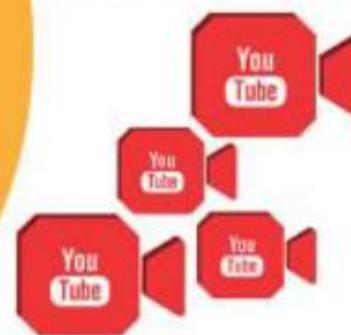
By 2014, it's anticipated there will be

420 MILLION WEARABLE, WIRELESS HEALTH MONITORS



4 BILLION+ HOURS OF VIDEO

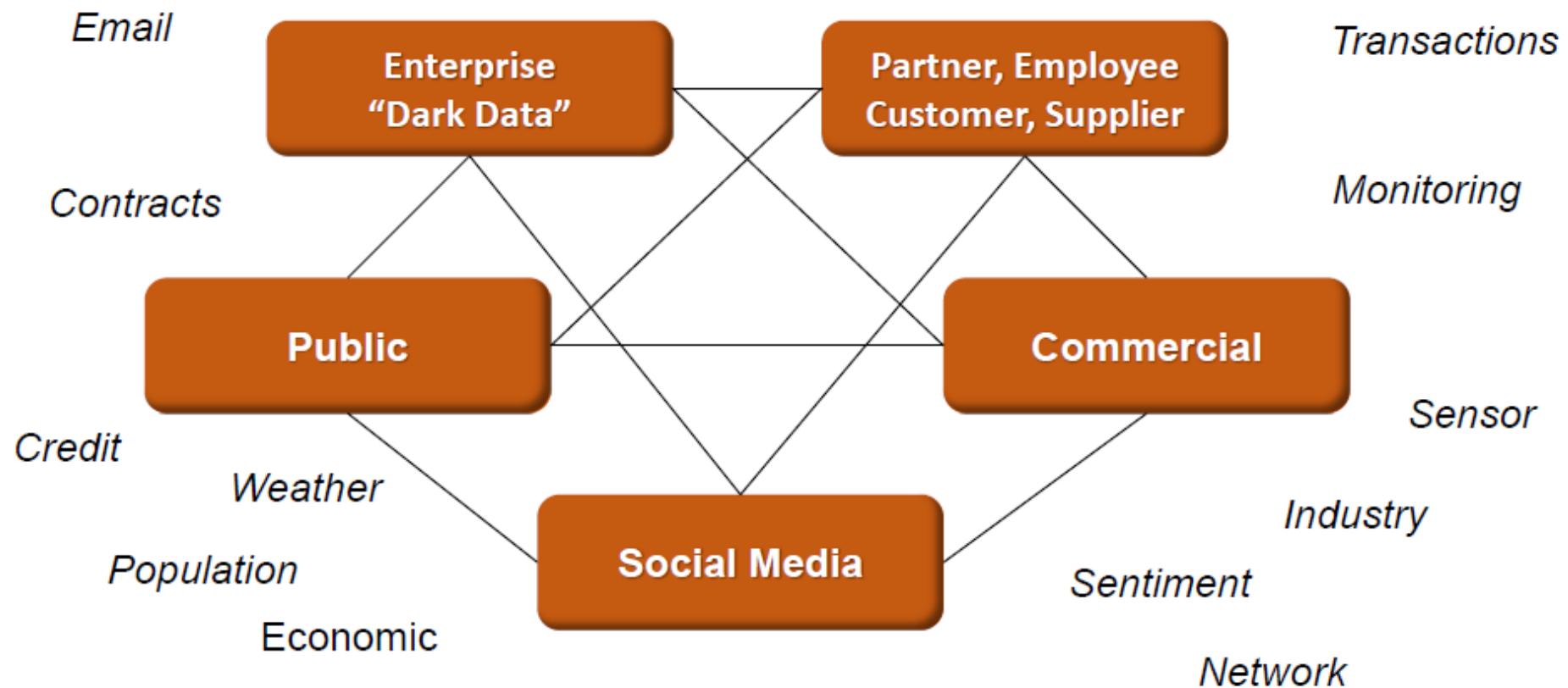
are watched on YouTube each month



400 MILLION TWEETS

are sent per day by about 200 million monthly active users

Where does Big Data come from?



Business Analytics/ Business Intelligence

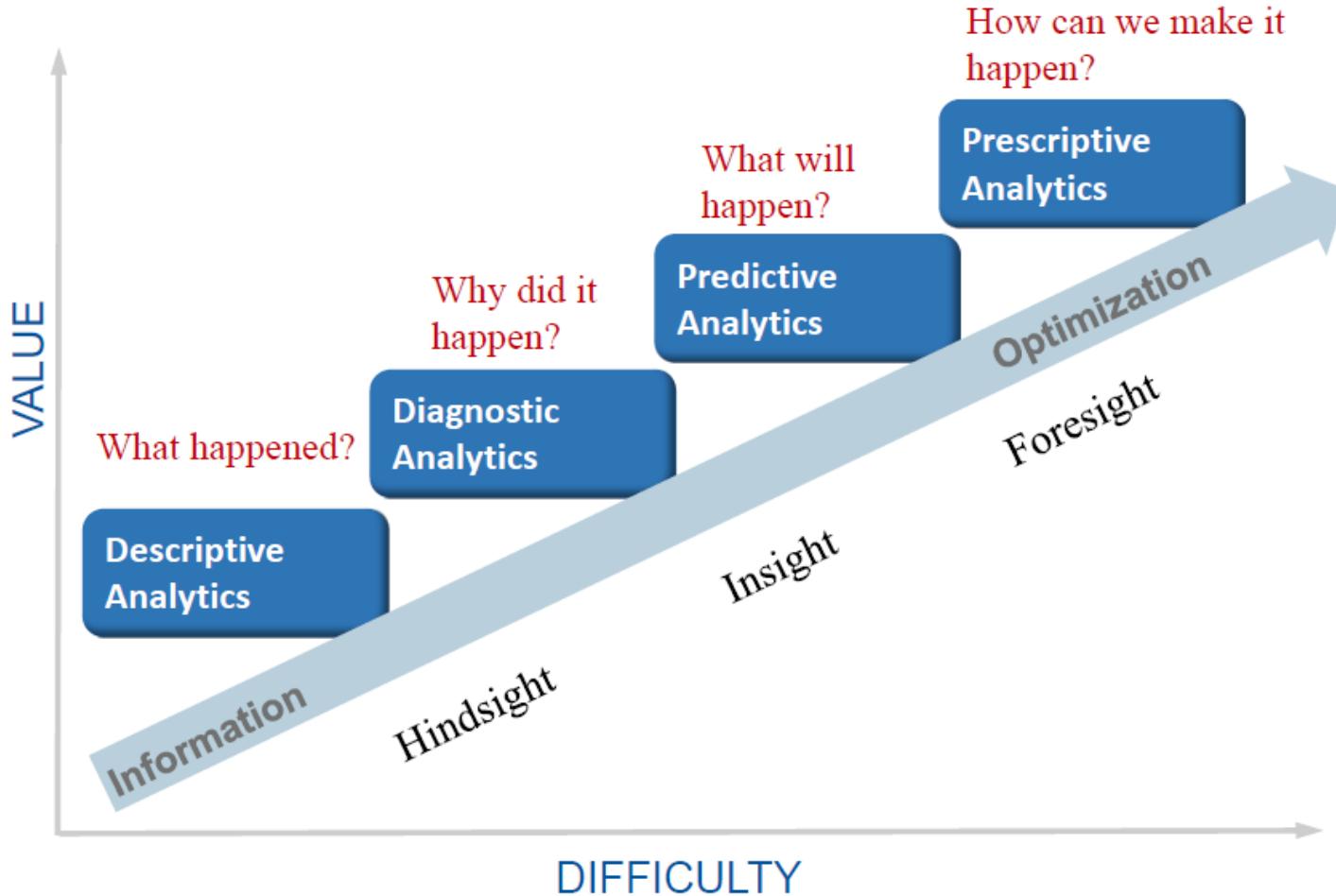
- Business Analytics/Business intelligence (BI) is a broad category of applications, technologies, and processes for:
 - gathering,
 - storing,
 - accessing, and
 - analyzing data
- to help business users make better decisions.

Things Are Getting More Complex

- Many companies are performing new kinds of analytics (**sentiment analysis, etc.), to better and more quickly understand and respond to what customers are saying about them and their products.
- The cloud, and appliances are being used as data stores
- Advanced analytics are growing in popularity and importance

****Sentiment analysis** (also known as **opinion mining**) refers to the use of natural language processing, text analysis and computational linguistics to identify and extract subjective information in source materials.

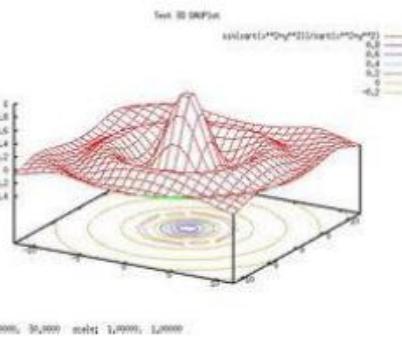
Analytics Models



Descriptive Analytics

- Descriptive analytics, such as reporting/ OLAP, dashboards, and data visualization, have been widely used for some time.
- They are the core of traditional BI.

Year	2000			
Line Items	Budget	Actual	Budget	Actual
Cost of Goods Sold	\$6,651,006.49	\$7,132,961.38	\$4,322,514.74	\$4,526,954.71
Marketing Expense	\$750,179.20	\$756,596.17	\$455,048.05	\$462,815.40
Research and Development Expense	\$538,243.39	\$538,014.73	\$329,890.95	\$336,808.13
Selling Expense	\$1,632,921.64	\$1,579,790.16	\$986,887.49	\$927,970.90
Taxes	\$314,659.05	\$319,390.19	\$202,636.67	\$200,205.01
Year	2001			
Line Items	Budget	Actual	Budget	Actual
Cost of Goods Sold	\$2,554,568.31	\$2,700,773.16	\$1,726,031.16	\$1,773,448.08
Marketing Expense	\$294,766.22	\$290,696.70	\$187,757.29	\$176,778.55
Research and Development Expense	\$200,719.90	\$193,236.83	\$134,270.95	\$125,725.88
Selling Expense	\$620,427.30	\$611,649.47	\$405,092.93	\$400,181.91
Taxes	\$130,926.70	\$122,526.31	\$82,450.78	\$80,671.87



What has occurred?

Descriptive analytics, such as data visualization, is important in helping users interpret the output from predictive and predictive analytics.

Predictive Analytics

- Algorithms for predictive analytics, such as regression analysis, machine learning, and neural networks, have also been around for some time.

What will occur?

- Marketing is the target for many predictive analytics applications.
- Descriptive analytics, such as data visualization, is important in helping users interpret the output from predictive and prescriptive analytics.

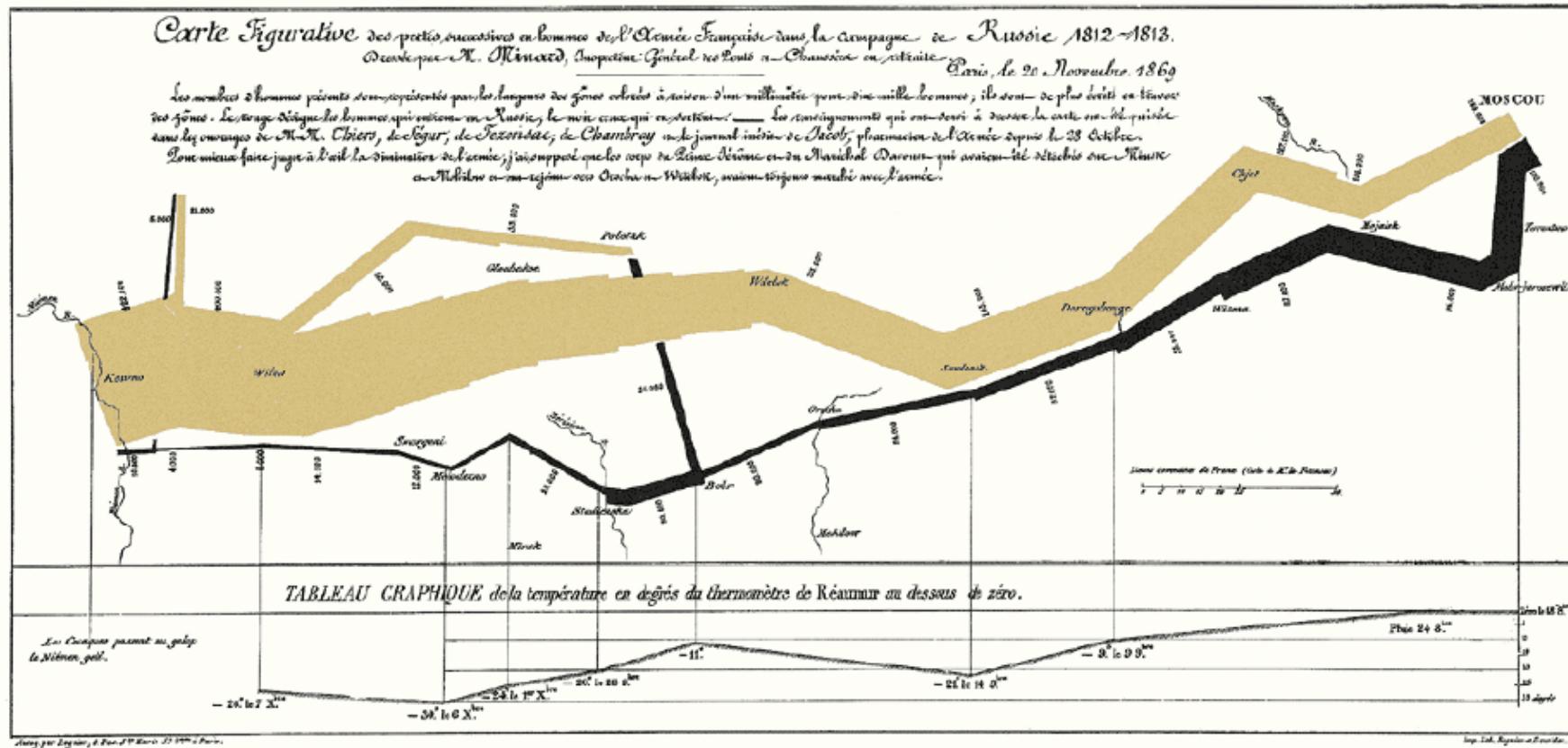
Prescriptive Analytics

- Prescriptive analytics are often referred to as advanced analytics.
- Often for the allocation of scarce resources
- Optimization

What should occur?

Prescriptive analytics can benefit healthcare strategic planning by using analytics to leverage operational and usage data combined with data of external factors such as **economic data, population demographic trends and population health trends**, to more accurately plan for future capital investments such as new facilities and equipment utilization as well as understand the trade-offs between adding additional beds and expanding an existing facility versus building a new one.

What makes a good chart?



Napoleon's 1812 March by
Charles Joseph Minard

Perhaps the most famous data presentation...

Reprinted in Tufte (2009), p. 41

Willard C. Brinton, 1914

First business book about visualization

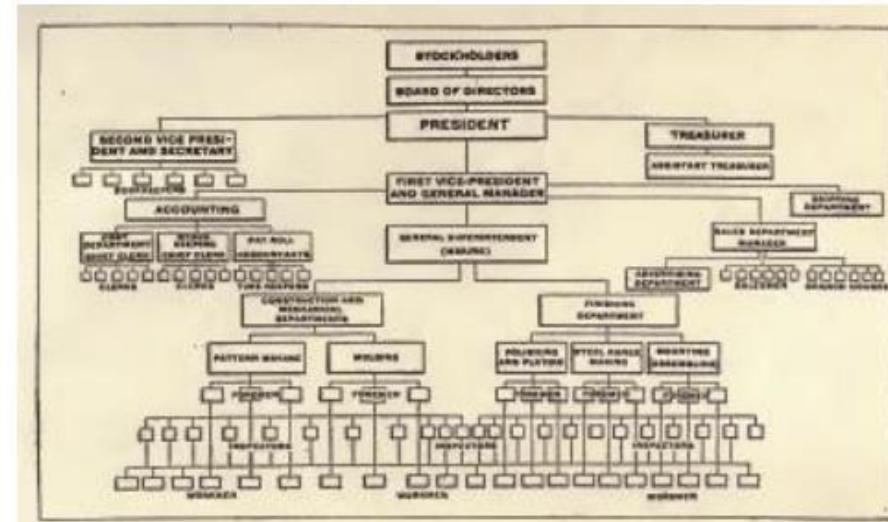
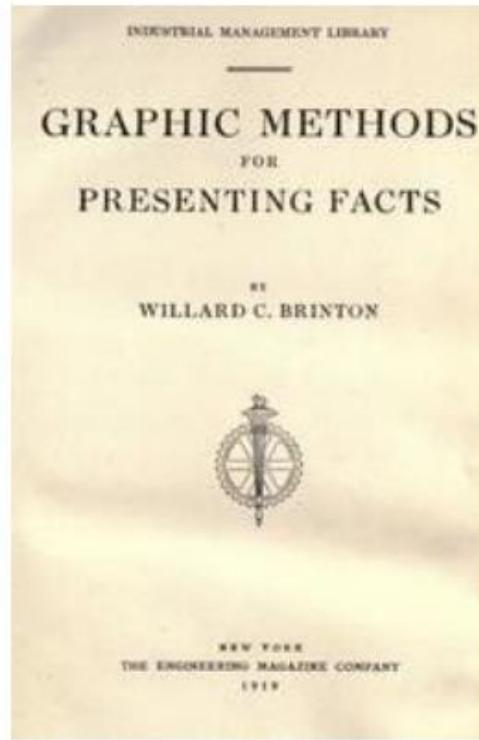


Fig. 13. Organization Chart of a large Company Manufacturing Stoves
A complete organization chart should always include the stockholders and the Board of Directors as shown here

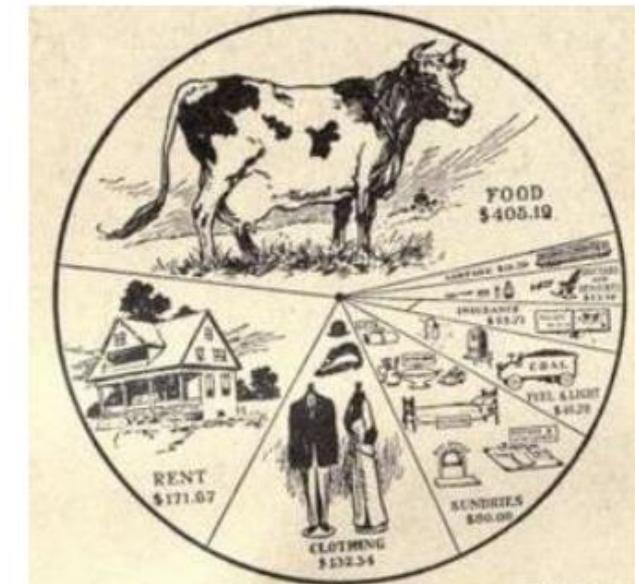
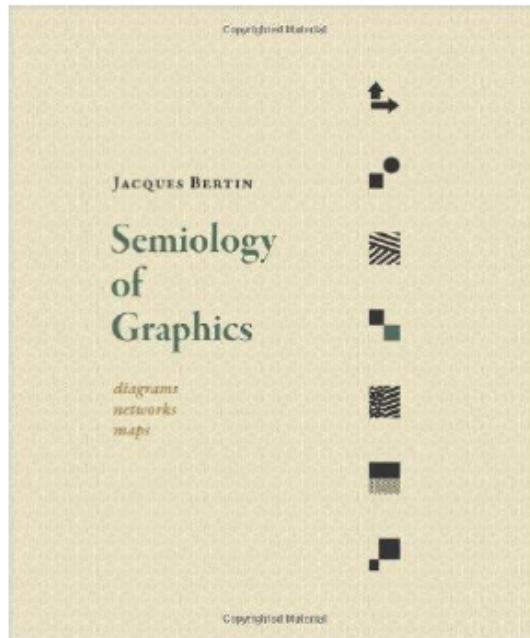


Fig. 3. Disposition of a Family Income of from \$900 to \$1000
This cut shows an attempt to put figures in popular form.
The eye is likely to judge by the size of the pictures rather than by the angles of the sectors

Jacques Bertin

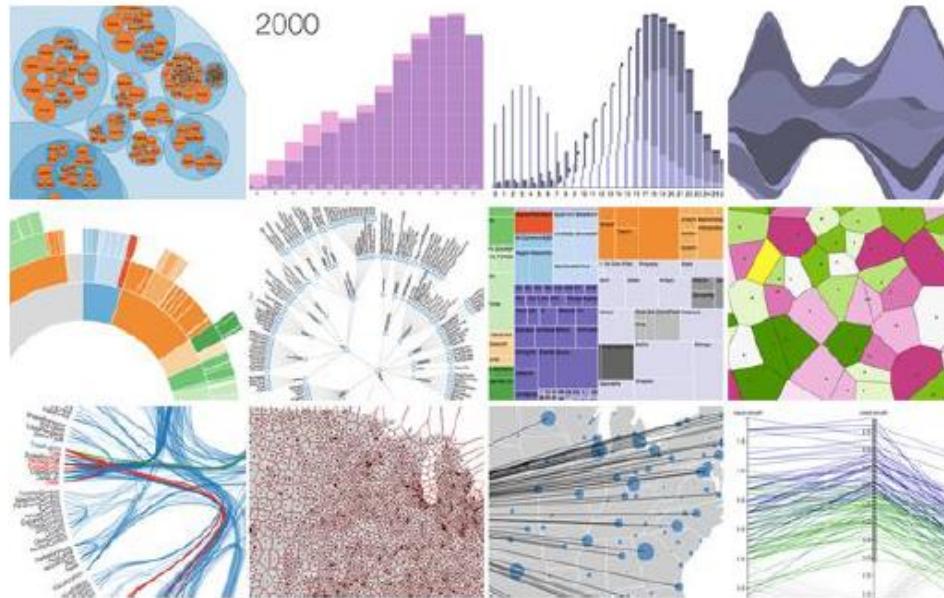
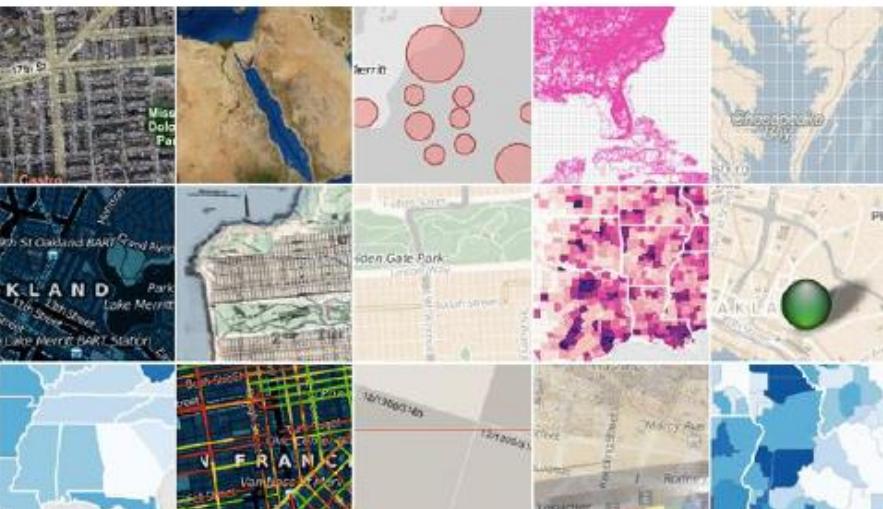
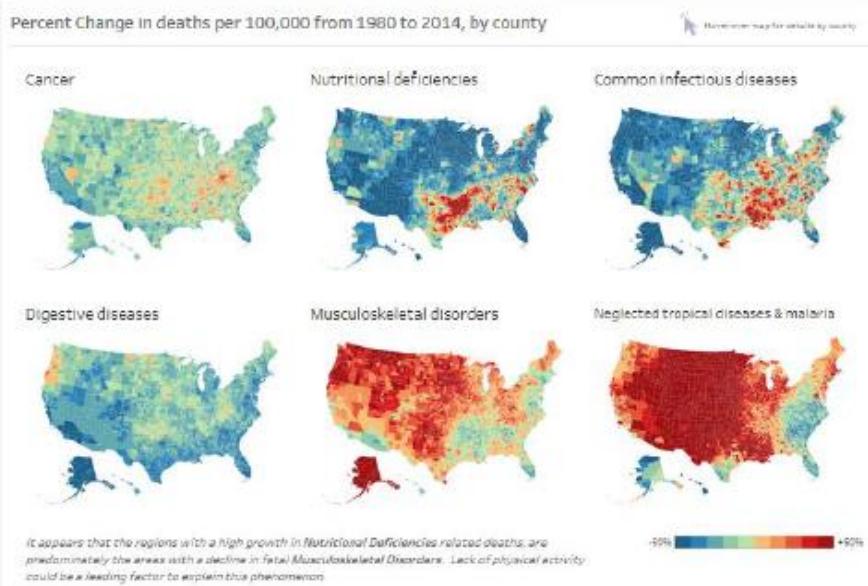
Seven Visual Variables



Bertin's Original Visual Variables						
Position changes in the x, y location						
Size change in length, area or repetition						
Shape infinite number of shapes						
Value changes from light to dark						
Colour changes in hue at a given value						
Orientation changes in alignment						
Texture variation in 'grain'						

- Position
- Size
- Shape
- Color
- Brightness
- Orientation
- Texture

Vast Data Visualization Choice



What is data visualization and why is it important?

- **Data visualization** is the act of taking information (**data**) and placing it into a visual context, such as a map or graph. **Data visualizations** make big and small **data** easier for the human brain to understand, and **visualization** also makes it easier to detect patterns, trends, and outliers in groups of **data**.

The best data visualization software in 2024

- 1.Tableau
- 2.Power BI
- 3.Qlik Sense
- 4.Looker
- 5.D3.js
- 6.Sisense
- 7.MicroStrategy
- 8.Google Data Studio
- 9.Chartio
- 10.Zoho Analytics
- 11.Grafana
- 12.Adobe Analytics
- 13.ThoughtSpot
- 14.TIBCO Spotfire

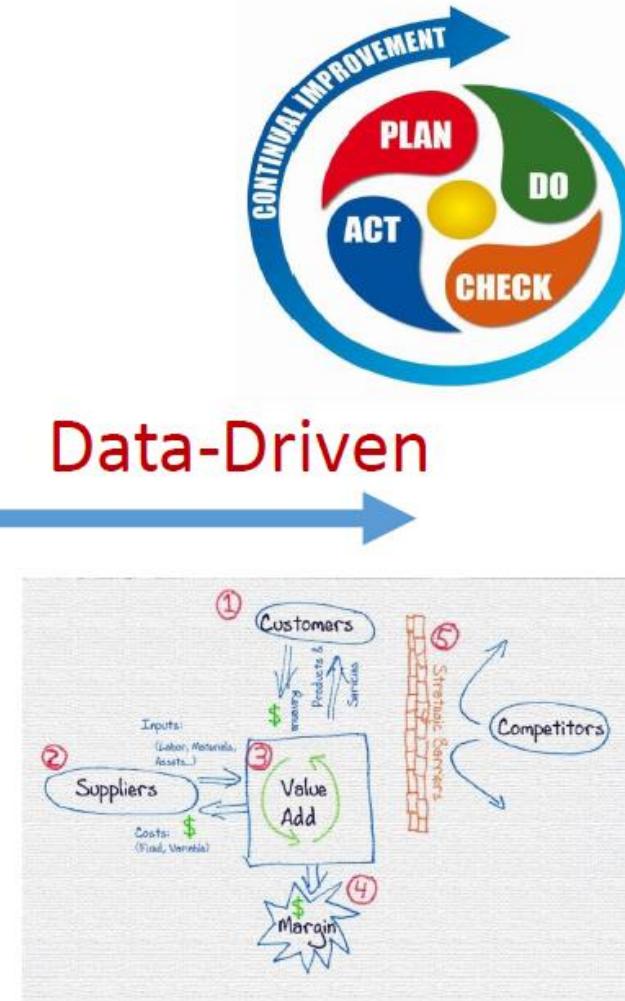
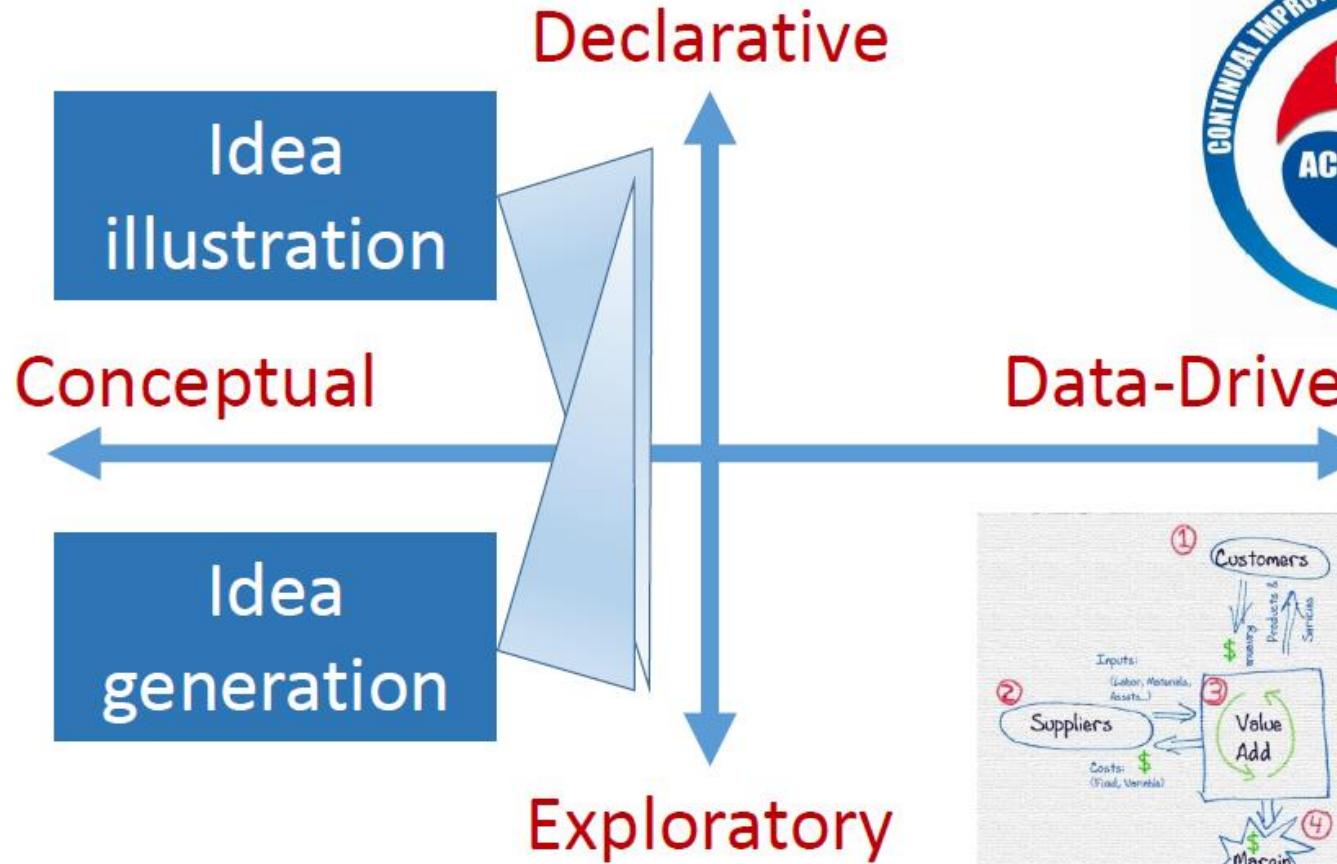
What is data discovery and visualization?

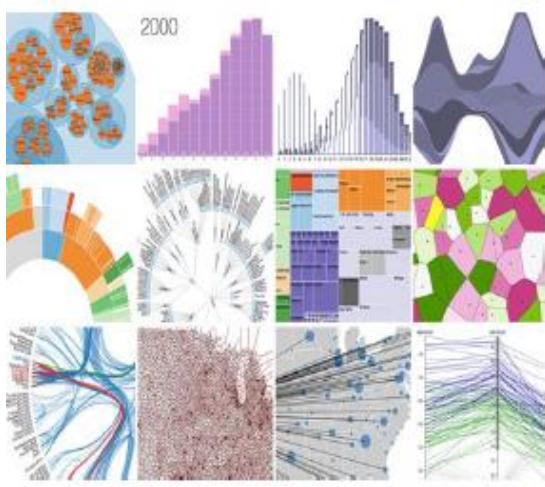
- **Data discovery** is the process of breaking complex **data** collections into information that users can understand and manage. It turns incomprehensible mounds of raw **data** into groups, sets, and relationships, making order out of chaos.
- **Data discovery** answers the question, “What does it all mean?”
- Data visualization is its representation.

Is Excel a data visualization tool?

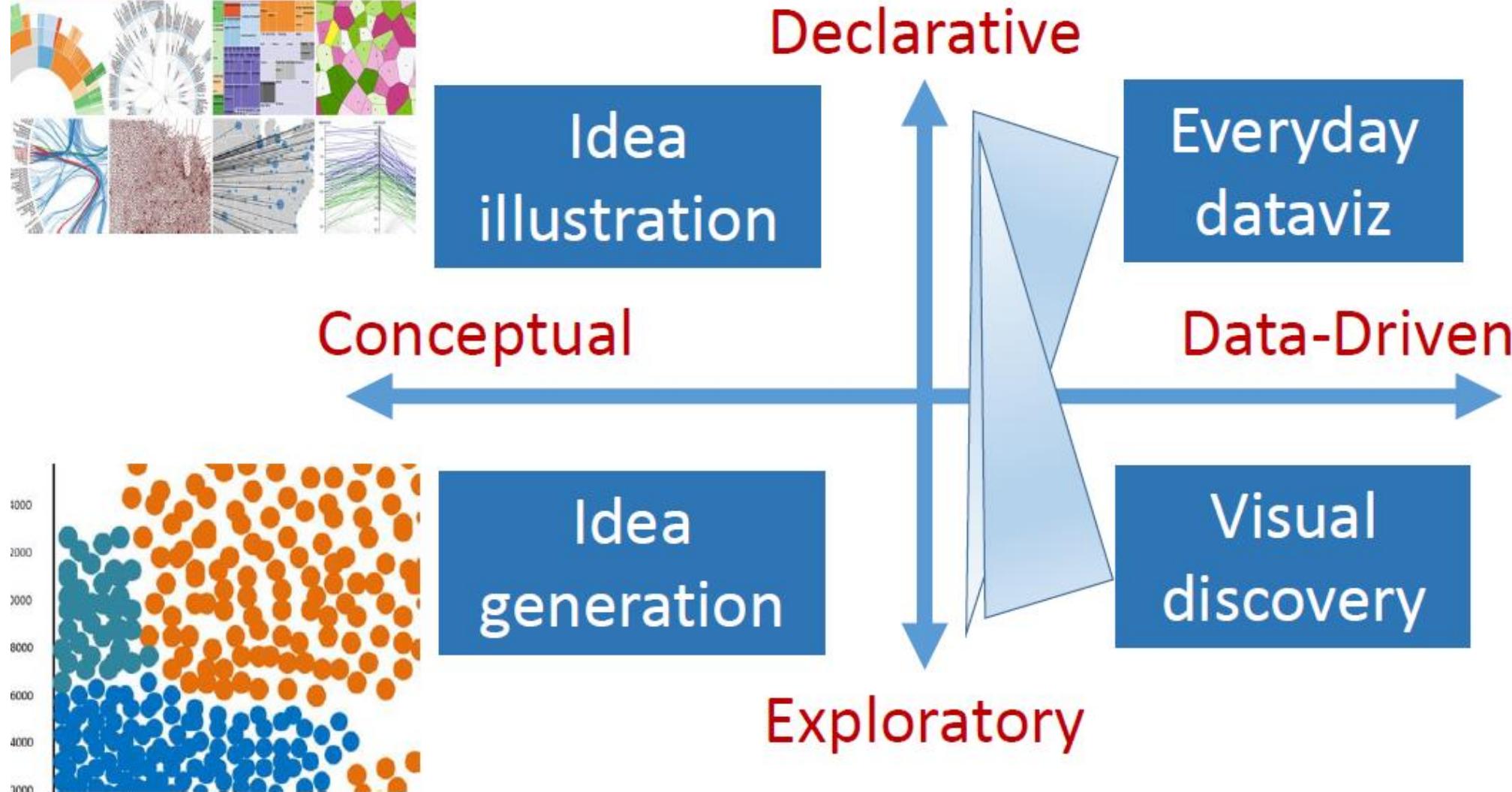
- **Excel** is a spreadsheet **tool**, while Tableau is a **data visualization** one.
- Spreadsheet **tools** are electronic worksheets that display **data** in a tabular format (a table of columns and rows).
- Each **data** point is stored in “cells” and can be manipulated by manually set formulas.

Four Types of Data Visualizations





Four Types of Data Visualizations



Data Visualization

provide clear understanding of patterns in data

detect hidden structures in data

condense information

Some basic principles (adapted from Tufte 2009)

1

- The chart should tell a story

2

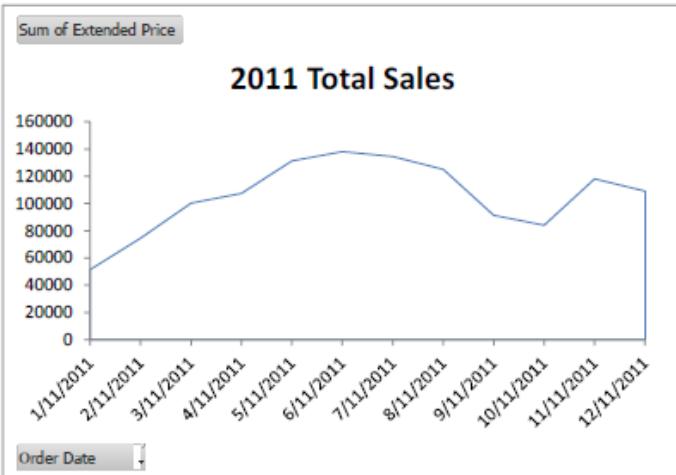
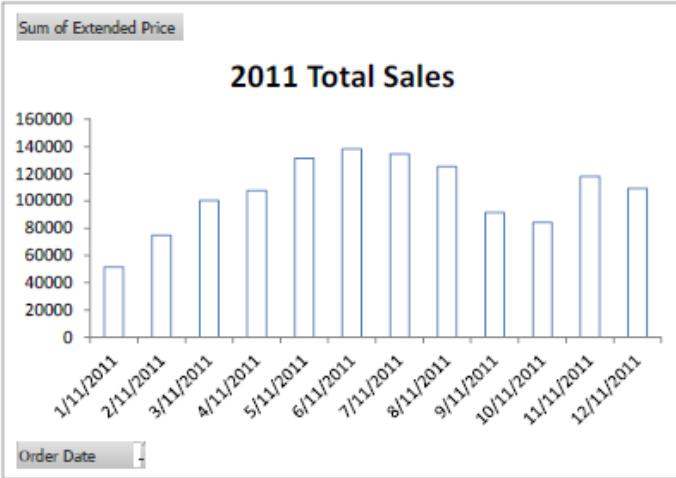
- The chart should have graphical integrity

3

- The chart should minimize graphical complexity

Tufte's fundamental principle:
Above all else show the data

What makes a good chart?



Sometimes it's
really a matter of
preference.

These both
minimize data ink.

Why isn't a table
better here?

Introduction to MicroStrategy

Introduction to MicroStrategy

Don't Build Dashboards - Build Applications
MicroStrategy Dossier™

Introduction to MicroStrategy

- Reports and simple dashboards are insufficient.
- Users demand multi-dimensional applications.
- Key features:
 - Responsive design
 - Interactive controls
 - Context-rich personalization

Introduction to MicroStrategy

MicroStrategy Dossier Overview

- Fully open design canvas
- Rich library of visualizations, shapes, and formatting controls
- Intuitive drag-and-drop authoring interface
- Lowers learning curve for analytics application development

Benefits of MicroStrategy Dossier

- Optimized for no-code responsive design:
 - iOS
 - Android
 - Desktop
- Ideal for self-service and functional applications
- Delivers Intelligence Everywhere

Introduction to MicroStrategy

MicroStrategy Library™ and MicroStrategy App™

- Decision-makers require a personalized analytics portal.
- **MicroStrategy Library** features:
 - Build no-code, accessible analytics applications
 - Curate and share ready-made content bundles
 - Personalize experiences with bundles, alerts, subscriptions, and bookmarks

Introduction to MicroStrategy

Enhancements in 2022

- Introduction of Applications:

- Turn Library into a fully customized analytics portal
- Design personalized Applications without coding
- Tailor for user groups, departments, or executives

Introduction to MicroStrategy

MicroStrategy App Features

- Access analytics content from desktop
- Smart download, predictive caching, and automatic refresh capabilities
- Offline access with up to 60% faster performance
- Responsive design for mobile application

Introduction to MicroStrategy

MicroStrategy Workstation™

- Modern experiences for all organization roles
- A one-stop shop for:
 - Analysts
 - Architects
 - Administrators
- Features:
 - Free-form layers
 - Information windows
 - Infographic-style scrolling

Introduction to MicroStrategy

MicroStrategy AI BOT

AI Chatbot • AI Dashboard • AI Analytics

MicroStrategy AI

Integrate Auto, our virtual AI assistant, seamlessly into existing workflows to change the way users work.

Start your 30-day trial

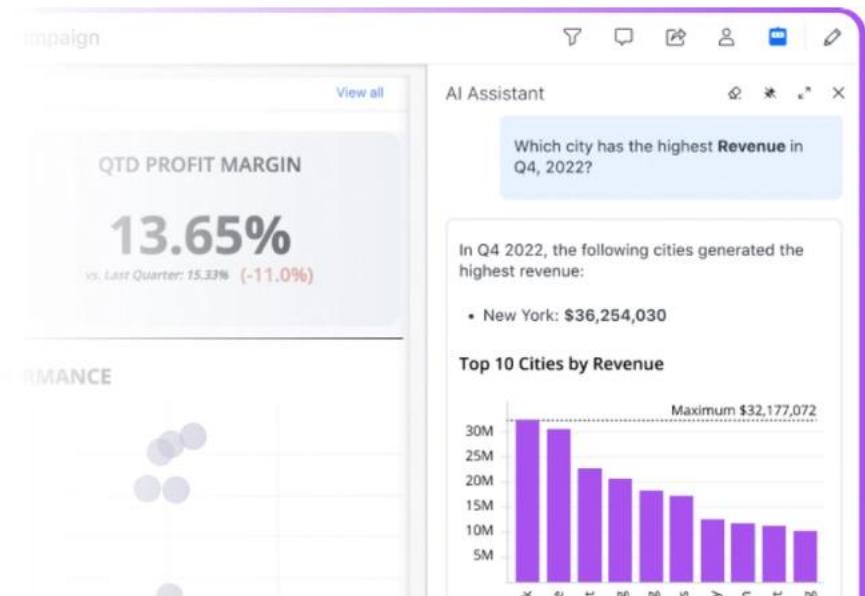
Introduction to MicroStrategy

MicroStrategy AI BOT

AI FEATURES AND CAPABILITIES

What's available with MicroStrategy AI?

We provide an entire suite of artificial intelligence products, with access to full GenAI customization to create cutting-edge applications. This is amplified by MicroStrategy Cloud and microservices for rapid deployment at scale. Enable users to discover insights with conversational AI, get creative with AI-powered dashboard design, or code on your own terms.



Introduction to MicroStrategy

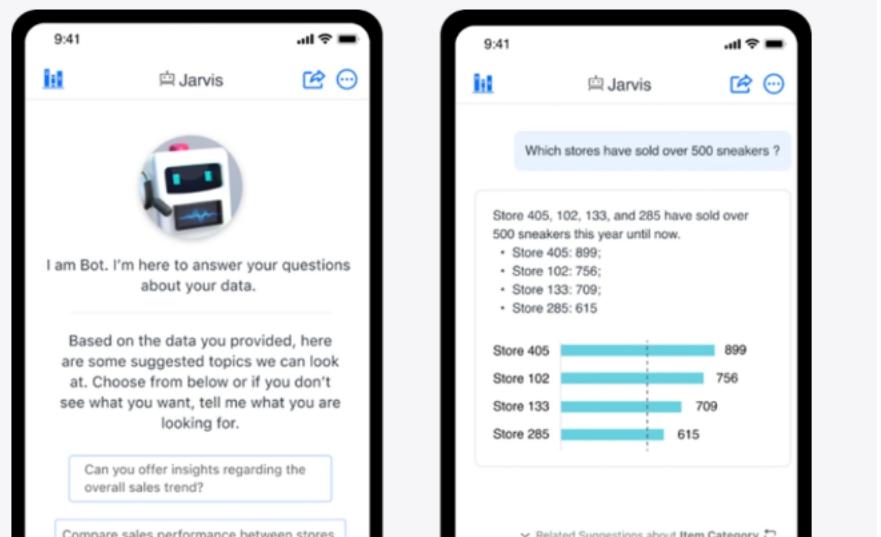
MicroStrategy AI BOT

Meet Auto. Your virtual AI assistant.

Completing the most complex tasks automatically. Driving faster results.

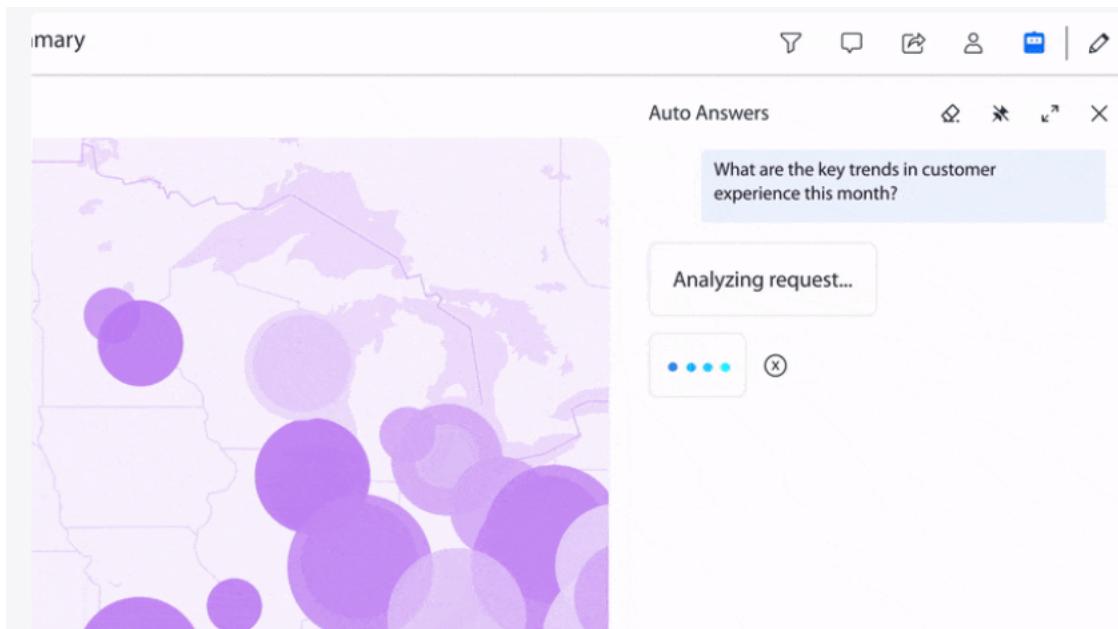
Auto Bot

Custom bots make it super easy for literally anyone to ask and answer questions using simple natural language - right from where they work every day. Auto Bots are super easy to build and deploy so that you can put them anywhere they are needed such as embedded in your company portal, on mobiles at your point of sale, or directly from Teams. And, each bot is highly customizable and can be quickly tailored to understand the unique needs of your business.



Introduction to MicroStrategy

MicroStrategy AI BOT



Auto Answers

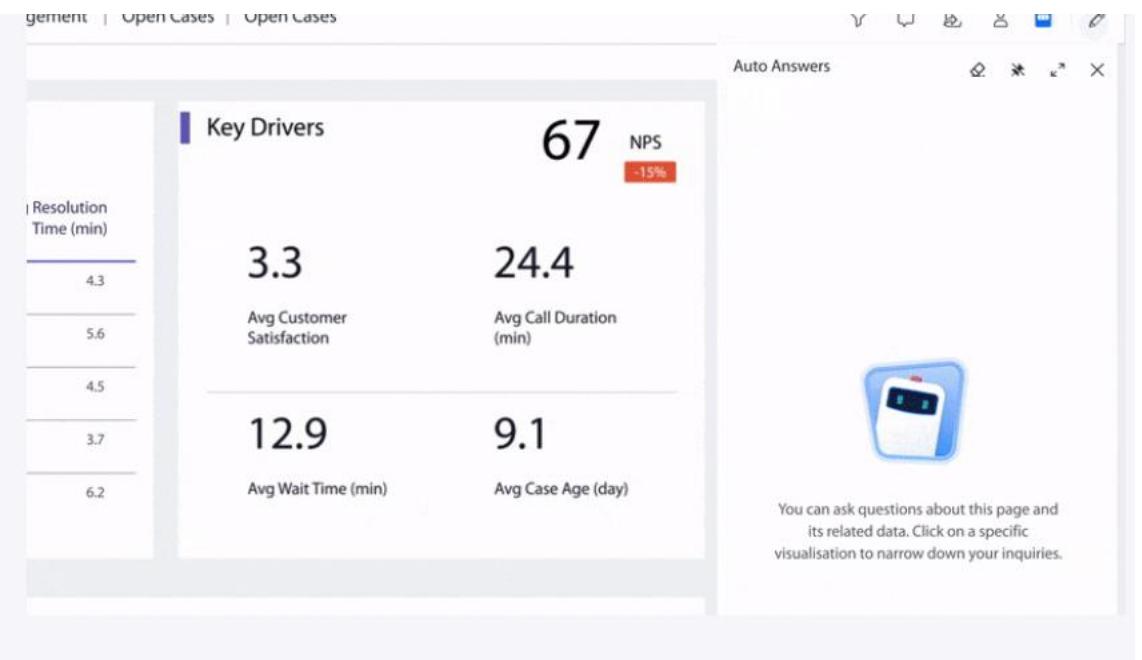
Our mission is intelligence everywhere—for everyone, anywhere. The rise of large language models (LLMs) and simplicity of conversational AI allows you to extend data access. MicroStrategy's AI-powered chatbot automatically answers questions for self-service insights that explain the "why" behind the data. Ask for specific data points, summaries, or about what-if scenarios in real time. AI simplifies analytics and lowers the barrier to access data. Embeddable in any application and supported in all languages.

Introduction to MicroStrategy

MicroStrategy AI BOT

Auto Dashboard

Unlock AI-powered design and deployment. Auto is your top collaborator on data visualizations, dashboards, reports, or entire apps—ask a question and watch content appear on your screen in seconds. Think of the data you want. And the style you want it. Auto will keep up with all your design specifications, as well as consider previous design choices and security compliance. Make changes or consult chat again for the perfect display. It's auto dashboard creation for any user, regardless of their technical proficiency.



Introduction to MicroStrategy

MicroStrategy AI BOT

The screenshot shows the MicroStrategy AI BOT interface. On the left, there is a table with two columns: 'age_group' and 'total_sales'. The data is as follows:

age_group	total_sales
18-34	50000
35-54	48000
35-54	47000
18-34	46000
55+	44000
18-34	43000
18-34	42000
35-54	41000
35-54	40000
55+	39000

In the center, there is a blue speech bubble containing a question: "Could you please get top 10 best-selling products for the year 2021, broken down by season and age group of customers?". Below the question are three buttons: "Explain", "Optimize", and a three-dot menu icon.

Auto SQL

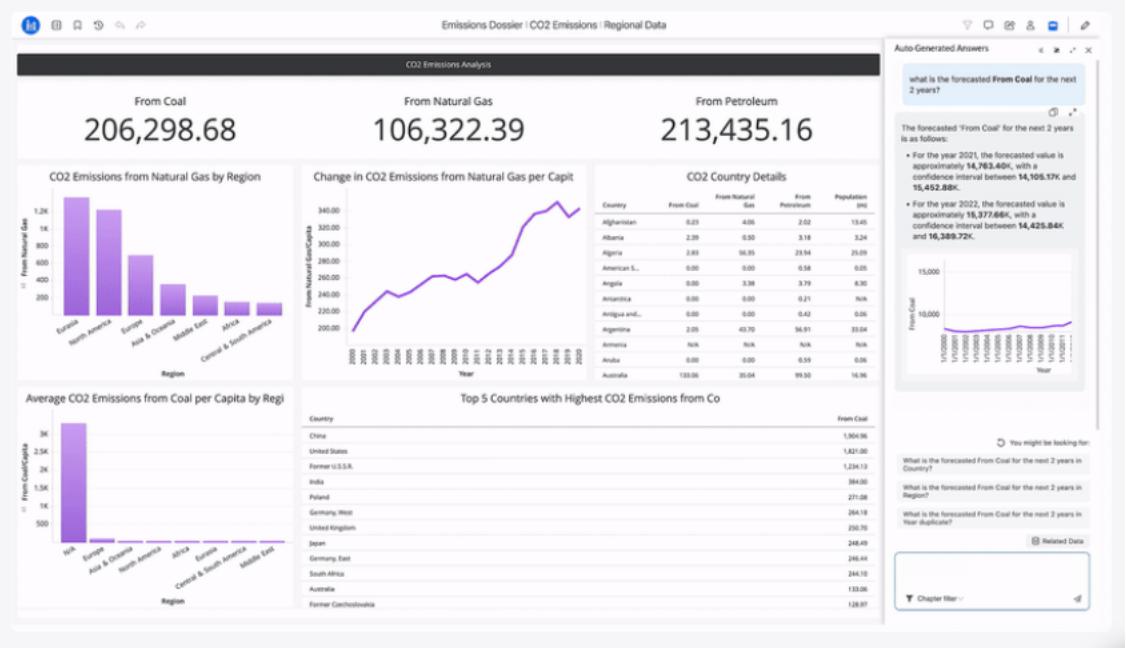
SQL complexity is no longer a problem. Designed for architects, automatically generate accurate and efficient SQL queries to answer business questions. Using natural language processing, Auto automatically translates plain text into SQL. This AI bot creates tables and joins on the fly, and can even make sense of the most complex SQL queries for you. Continue to provide information to adjust or optimize the SQL statements.

Introduction to MicroStrategy

MicroStrategy AI BOT

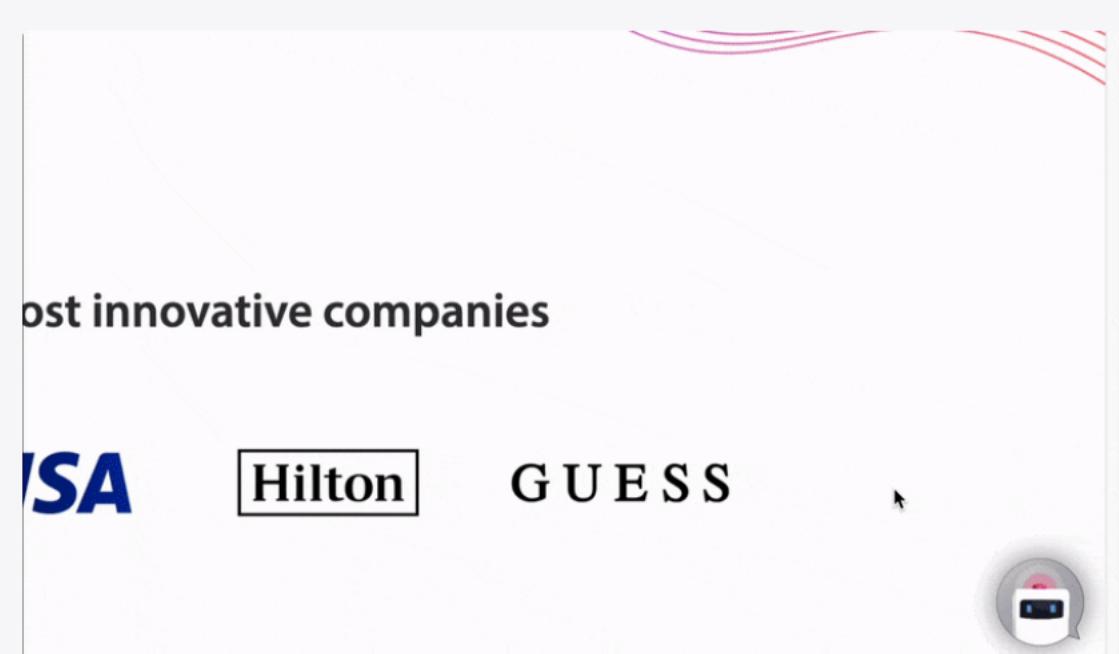
Advanced Analytics with AI

Revolutionize decision-making with an AI chatbot for advanced analytics. Automatically provide precise forecasting, allowing users to better anticipate market trends and optimize future strategy. Enable key driver analysis to unravel the complex web of factors that influence outcomes, helping organizations pinpoint critical drivers behind performance metrics. Or leverage Auto to track and highlight emerging data trends.



Introduction to MicroStrategy

MicroStrategy AI BOT



Auto Expert

Proficient in AI and analytics, our AI Expert chatbot revolutionizes how you find resources or learning materials. Seamlessly integrated into MicroStrategy's web experience, ask the chatbot questions on a variety of topics and quickly receive personalized responses. Get the latest articles or demos and rely on MicroStrategy AI for 24/7 product support.

Introduction to MicroStrategy

MicroStrategy AI BOT



Auto Expert

Proficient in AI and analytics, our AI Expert chatbot revolutionizes how you find resources or learning materials. Seamlessly integrated into MicroStrategy's web experience, ask the chatbot questions on a variety of topics and quickly receive personalized responses. Get the latest articles or demos and rely on MicroStrategy AI for 24/7 product support.

Conclusion

- Transition from dashboards to applications for better analytics.
- Emphasis on user experience and personalized analytics.



Try out the **MicroStrategy** platform