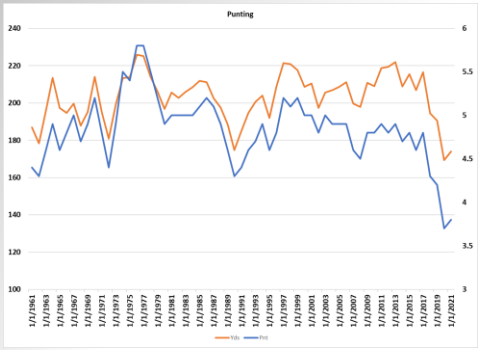
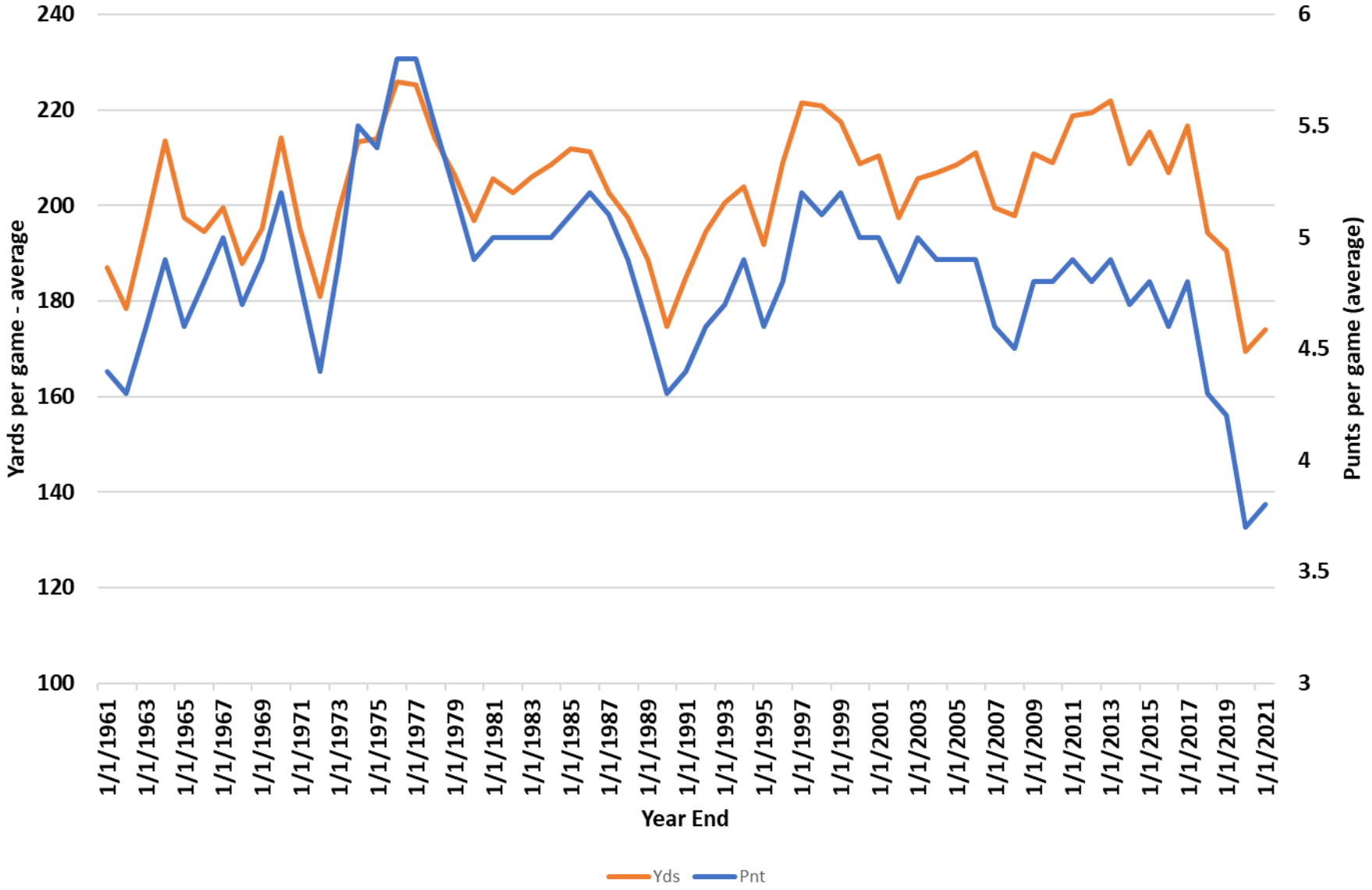


Data & Predictive Analytics & Business Intelligence for Controllers/CFOs

by Jim Lindell, CPA, CSP, CGMA

NFL Punting



Objectives

- Recognize that Accountants will be valued by information they derive and interpret instead of transaction aggregation and reporting.
- Identify how data analytics, predictive analytics and business Intelligence will become a central component of the accountant's responsibilities.
- Recognize how visual application can complement and sometimes outweigh traditional financial reporting.
- Identify the four phases of analytics and their relationship to the accounting function and career advancement.
- Recognize how Business Intelligence impacts the accounting role for staffing, data acquisition and analysis and machine learning (RPA).

Setting the Stage

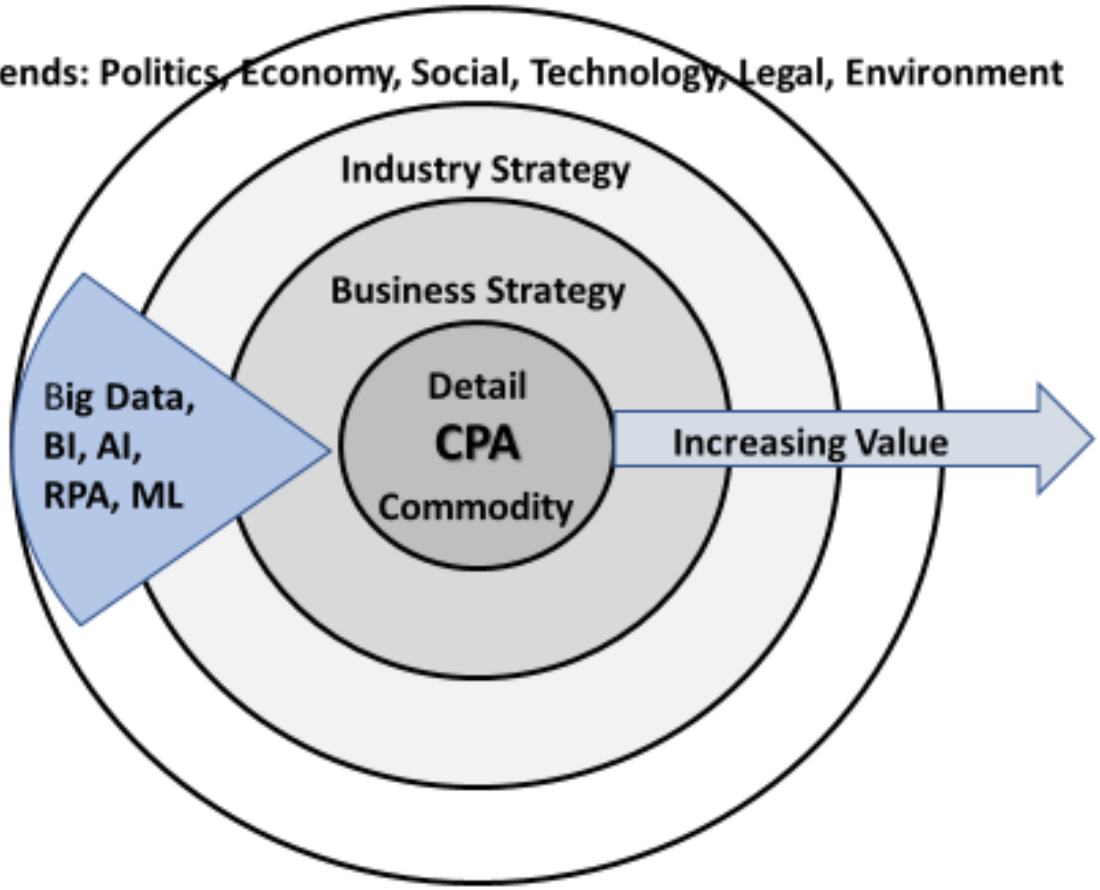
Remember who you are!

DataEase

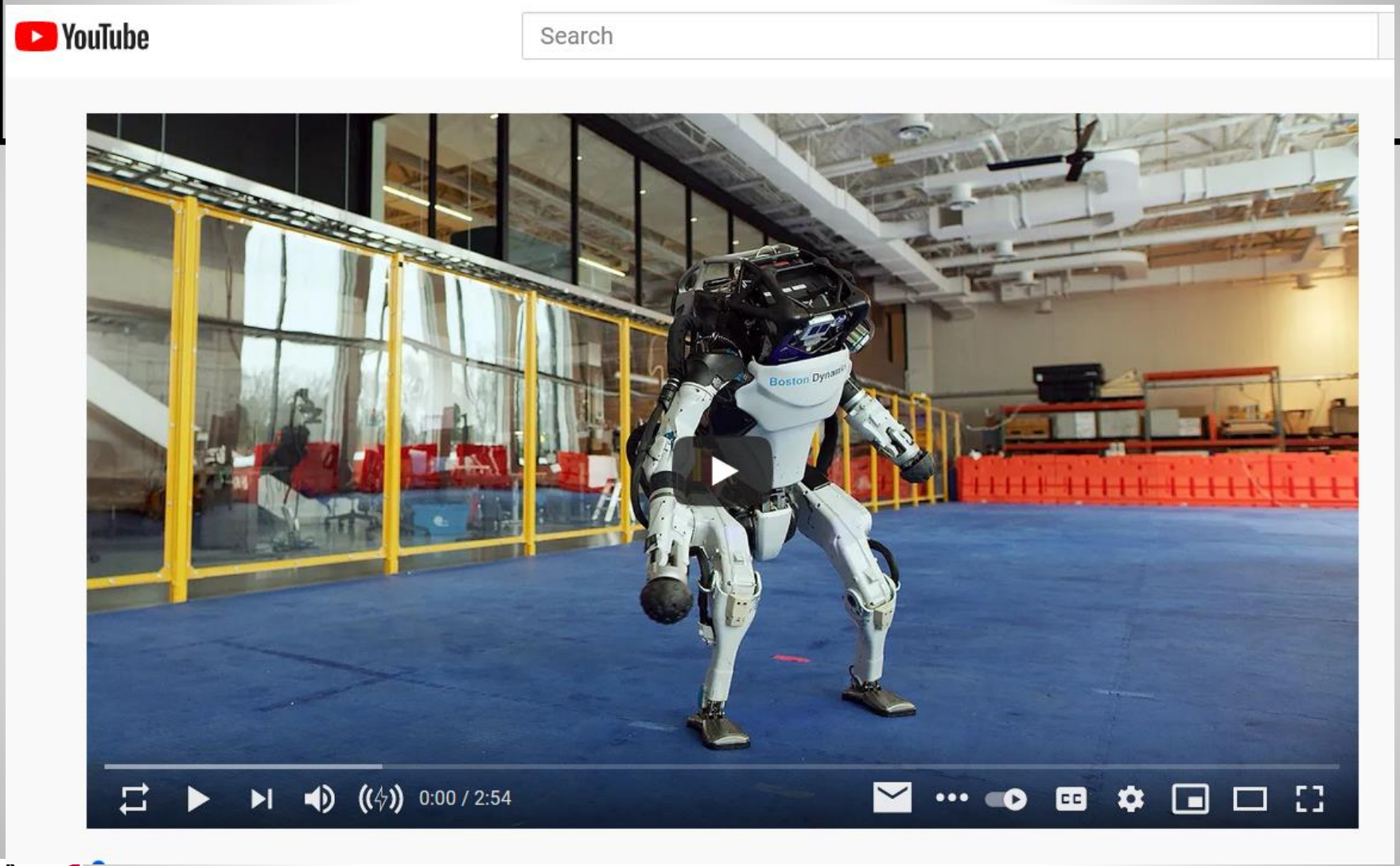
- 1917 Uniform Accounting Rules
- 1950s Budgeting
- 1960's & 70s Mainframe, Punch Cards, Visicalc
- 1980s Midframe – PCs, Servers, Networks, Email
- 1990s Internet, Netscape, "You've got mail"
- 2000s Cloud, Databases
- 2020s AI, RPA, BI, ML

Improving People's Lives and Their Businesses

Expanding CPA Value



Nov. 2020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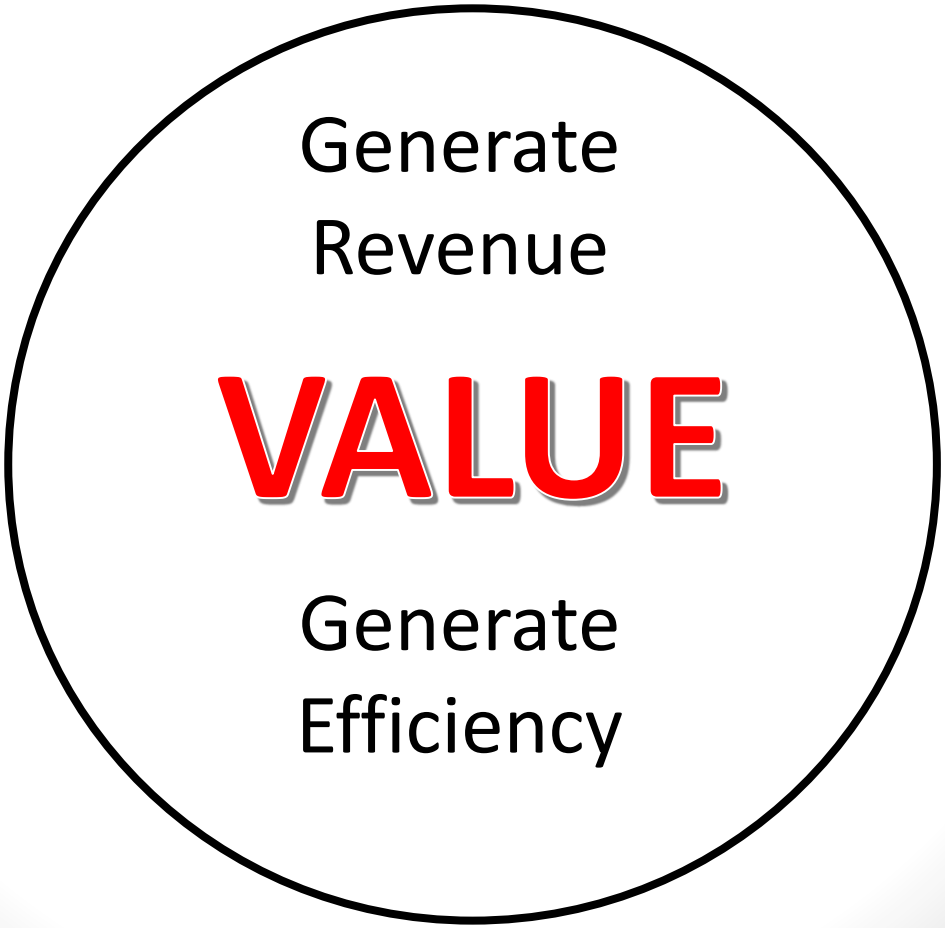
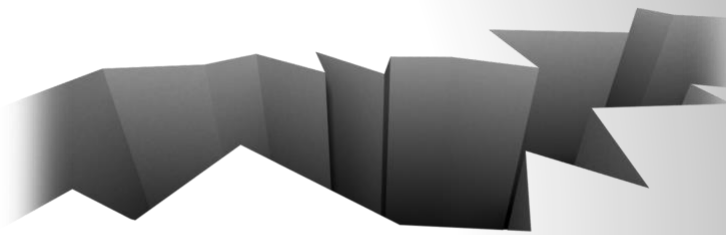
Big Picture



Improving People's Lives and Their Businesses

Accountants with data analytics skills are few and far between

- Among technical skills, here's what is missing the most:
  - Identifying key data trends (29 percent)
  - Data mining and extraction (28 percent)
  - Operational analysis (28 percent)
  - Technological acumen (27 percent)
  - Statistical modeling and data analysis (27 percent)
- The most significant gaps in nontechnical skills, or soft skills, are found in:
  - Decision analysis (37 percent)
  - Process improvement (35 percent)
  - Strategic thinking and execution (32 percent)
  - Adaptability to change (31 percent)
  - Communication skills (29 percent)



Bramwell, Jason. "Accountants with Data Analytics Skills Are Difficult to Find." AccountingWeb, April 27, 2016. https://www.accountingweb.com/practice/team/accountants-with-data-analytics-skills-are-difficult-to-find.

Accountants - Data science skills gap

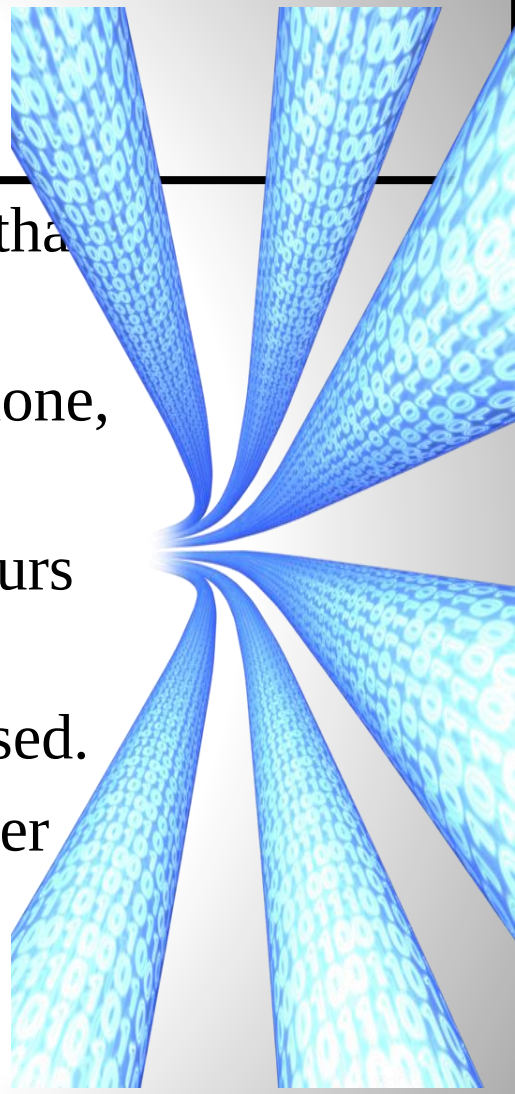
- Advanced Excel
- Data Mining/SQL Programming
- Advanced Revenue Analytics
- Mathematical Optimization
- Analytical Segmentation
- Visualization
- Real-time models
-

Hernandez, Robert. The 7 Data Science Skills That Will Change the Accounting Career

- Advanced Excel
- ERP (e.g., SAP, Oracle)
- Big data analysis, advanced modeling techniques and SQL
- Business intelligence software (e.g., IBM Cognos)
- Microsoft Visual Basic
- Hyperion (for analyst and financial reporting roles)
- QuickBooks (for positions with small and midsize firms)

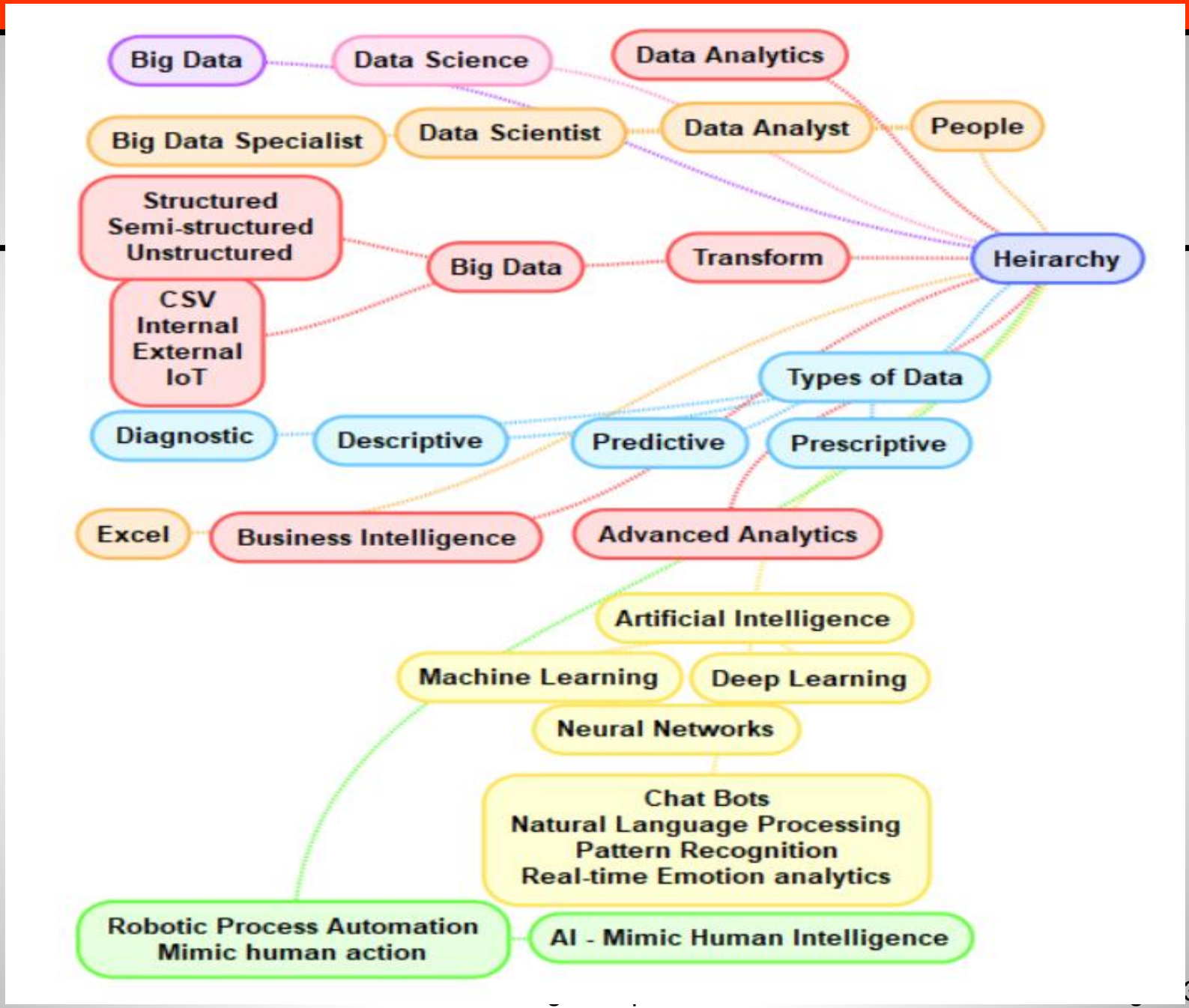
Robert Half - 7 Skills for Accountants to Succeed on the Job-

It’s all in the data

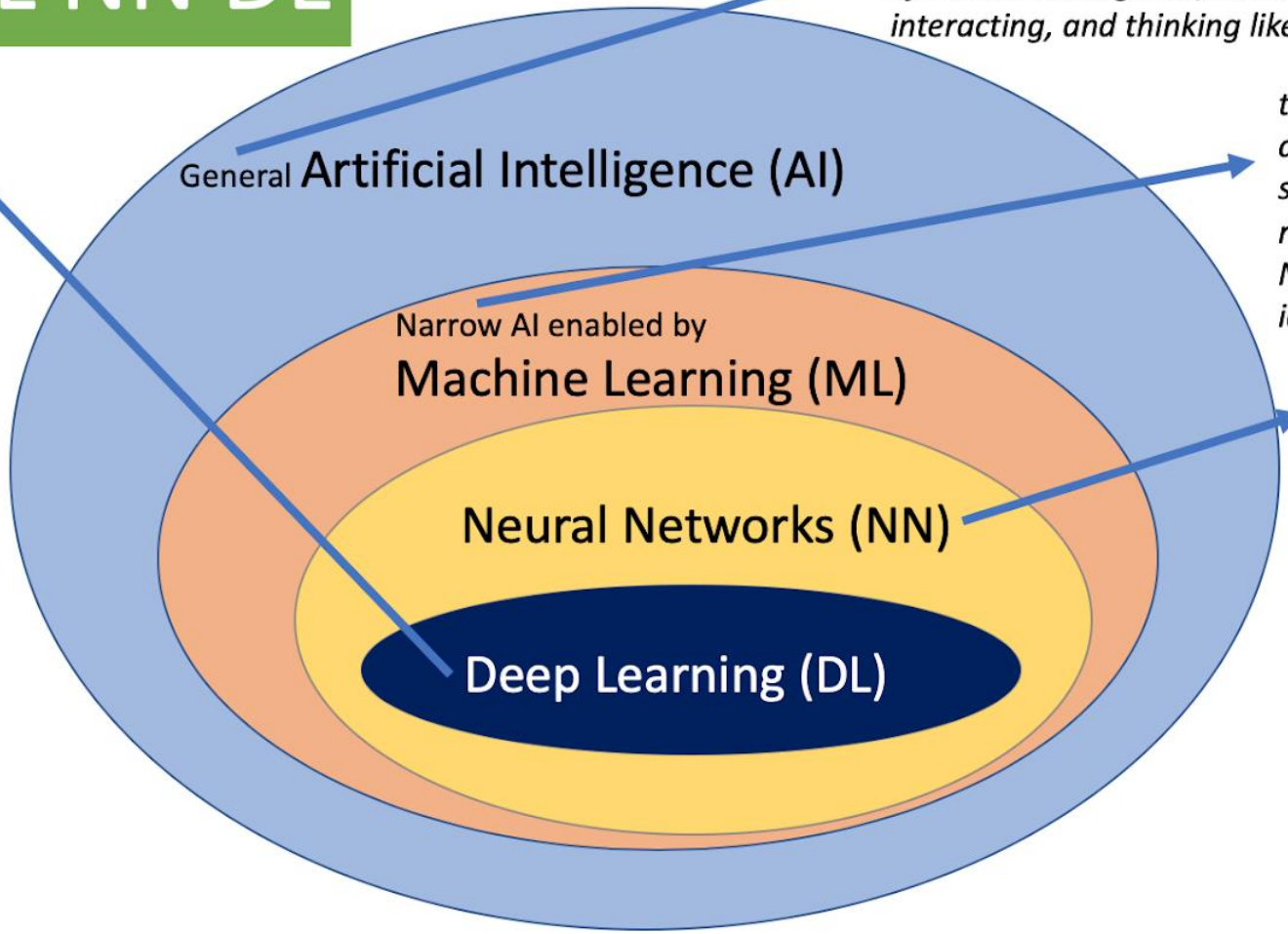


- More data was generated in the last two years tha in the entirety of mankind up until that point.
- 40,000 search queries per second on Google alone, or 1.2 trillion searches every year.
- Every minute, there are more than ~~300~~ 500 new hours of video uploaded to YouTube.
- 99.5% of collected data is never analyzed or used.
- Less than 50% of structure data from IoT is ever used in decision-making.

https://hostingtribunal.com/blog/big-data-stats/
Updated 2020



AI ML NN DL



computers possessing the same characteristics of human intelligence, including reasoning, interacting, and thinking like we do

technologies that can accomplish specific tasks such as playing chess, recommending your next Netflix TV show, and identifying spam emails

neural networks are a specific group of algorithms used for machine learning that model data using graphs of Artificial Neurons. Those neurons are a mathematical model that "mimics approximately how a neuron in the brain works"

the word "deep" comes from the fact that DL algorithms are trained/run on deep neu ral networks. These are just neural networks with (usually) three or more "hidden" layers

Business Intelligence and Data Analytics

- Definition BI - Business intelligence (BI) combines business analytics, data mining, data visualization, data tools and infrastructure, and best practices to help organizations to make more data-driven decisions. (Tableau)

- Definition DA - Data analytics is the science of analyzing raw data in order to make conclusions about that information. Many of the techniques and processes of data analytics have been automated into mechanical processes and algorithms that work over raw data for human consumption. (Investopedia)

Artificial Intelligence & Neural Networks

- At its simplest form, artificial intelligence is a field, which combines computer science and robust datasets, to enable problem-solving. It also encompasses sub-fields of machine learning and deep learning, which are frequently mentioned in conjunction with artificial intelligence. (IBM)
- Neural Networks - A computer system that is designed to mimic the human brain or some other biological system in its functioning. They were developed to deal with problems, such as pattern recognition, that the brain does well but that traditional computer systems cannot handle easily. (dictionary.com)

Four levels of analytics illustrated with financial statements

- Descriptive
- Diagnostic
- Predictive
- Prescriptive

Surveys and Trends

- Gartner
- BI-Survey
- CIO Review

Top Strategic Technology Trends for 2022

Data Fabric

Cybersecurity Mesh

Privacy-Enhancing Computation

Cloud-Native Platforms

Composable Applications

Decision Intelligence

Hyperautomation

AI Engineering

Distributed Enterprise

Total Experience

Autonomic Systems

Generative AI

Gartner®

Gartner Top Data and Analytics Trends for 2022

Activate Dynamism and Diversity	Augment People and Decisions	Institutionalize Trust
• Adaptive AI Systems • Data-Centric AI • Metadata-Driven Data Fabric • Always Share Data	• Context-Enriched Analysis • Business-Composed D&A • Decision-Centric D&A • Skills and Literacy Shortfall	• Connected Governance • AI Risk Management • Vendor and Regional Ecosystems • Expansion to the Edge

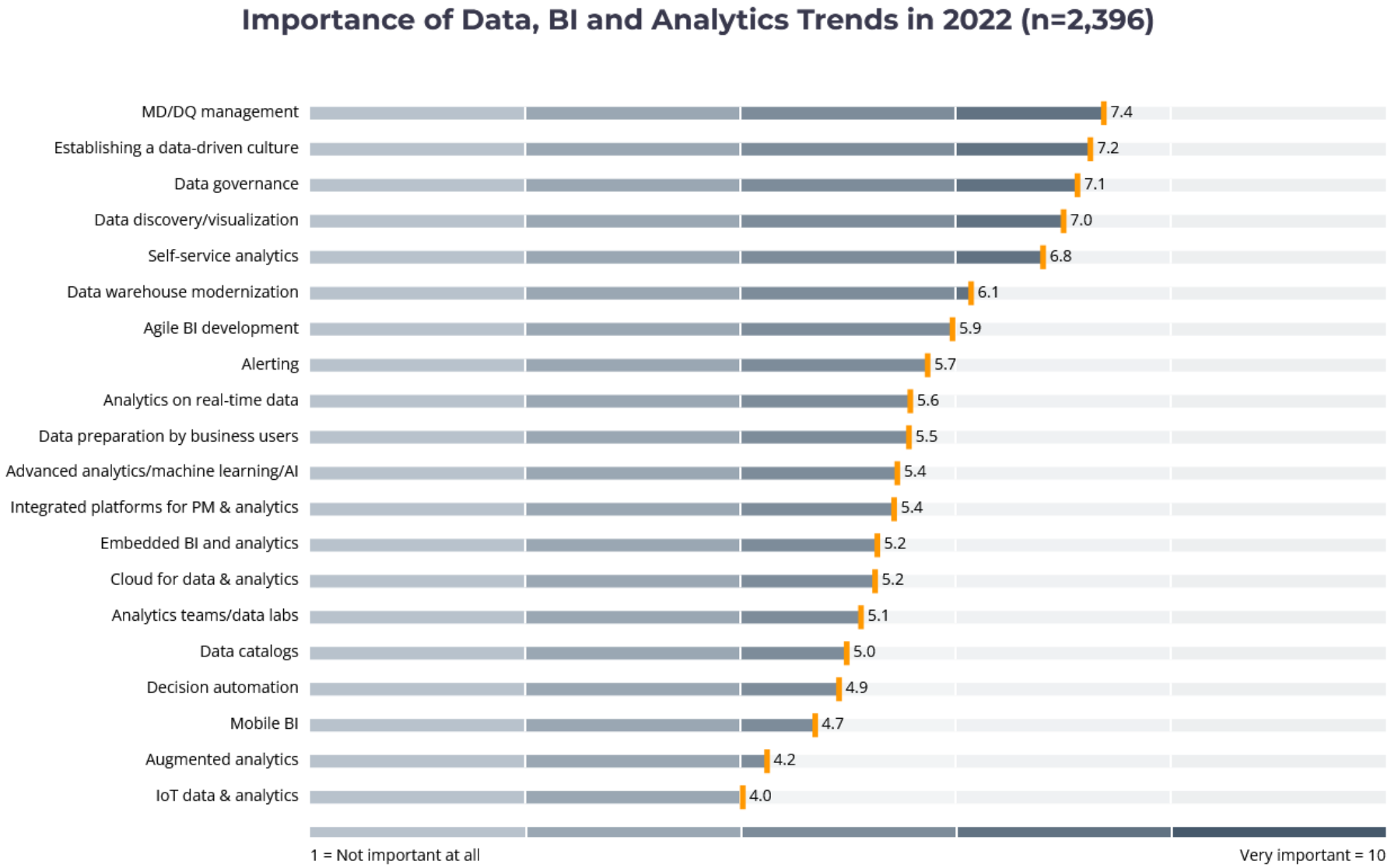
gartner.com

Source: Gartner

Gartner®

CIO Review – BI Trends 2022

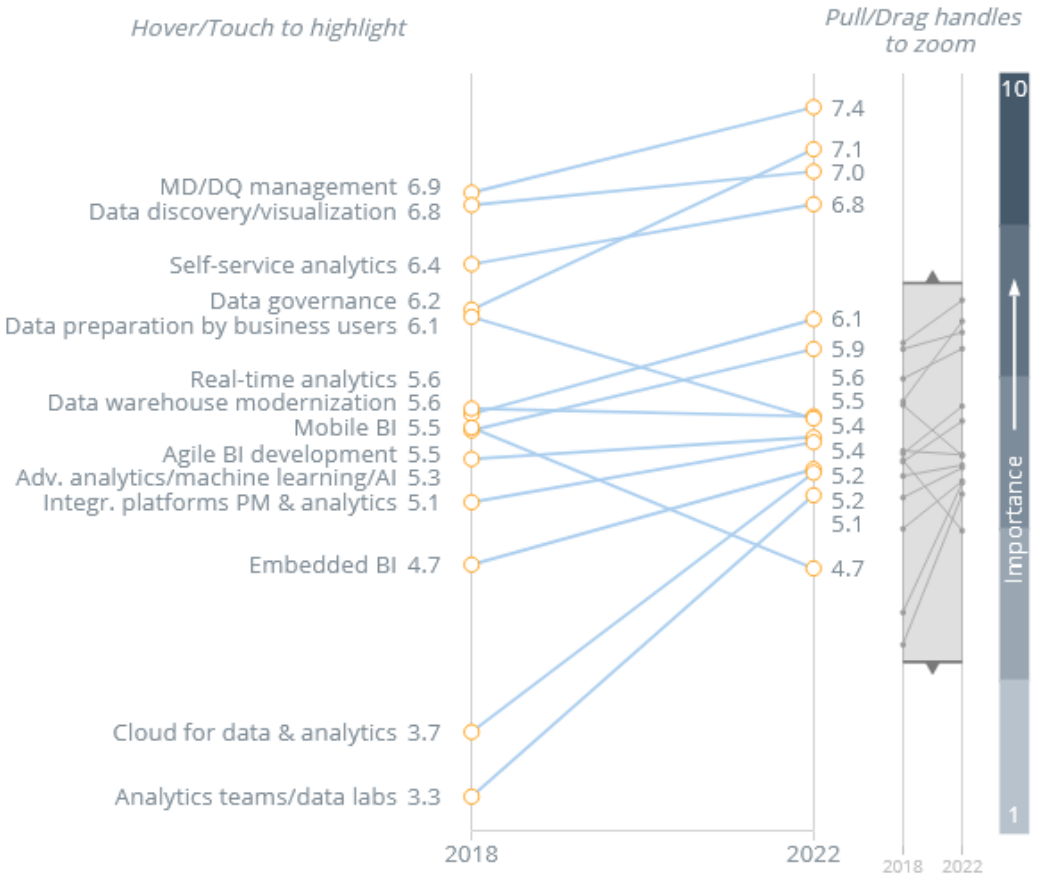
- Collaborative Business Intelligence
- Integration in BI tools
- Machine Learning
- Businesses can acquire a more data-driven culture.


Importance of Data, BI and Analytics Trends in 2022 (n=2,396)
MD/DQ management 7.4
Establishing a data-driven culture 7.2
Data governance 7.1
Data discovery/visualization 7.0
Self-service analytics 6.8
Data warehouse modernization 6.1
Agile BI development 5.9
Alerting 5.7
Analytics on real-time data 5.6
Data preparation by business users 5.5
Advanced analytics/machine learning/AI 5.4
Integrated platforms for PM & analytics 5.4
Embedded BI and analytics 5.2
Cloud for data & analytics 5.2
Analytics teams/data labs 5.1
Data catalogs 5.0
Decision automation 4.9
Mobile BI 4.7
Augmented analytics 4.2
IoT data & analytics 4.0
1 = Not important at all
Very important = 10

BI-SURVEY.com Home Tool Comparisons Product Reviews Analyzer Eco Maps BI Insig

Importance of Business Intelligence Trends (Timeline)

2018 | 2022 | All | Upward Trends | Downward Trends



MD/DQ Management

- Master Data Management
- Data Quality Management

Source: Bi-Survey.com

DQM

- **Data quality** can be defined in many different ways. In the most general sense, good data quality exists when data is suitable for the use case at hand.
- This means that quality always depends on the context in which it is used, leading to the conclusion that there is no absolute valid quality benchmark.

Source: Bi-Survey.com

DQM

Nonetheless, several definitions use the following rules for evaluating data quality:

- **Completeness**: are values missing?
- **Validity**: does the data match the rules?
- **Uniqueness**: is there duplicated data?
- **Consistency**: is the data consistent across various data stores?
- **Timeliness**: does the data represent reality from the required point in time?
- **Accuracy:** the degree to which the data represents reality

Source: Bi-Survey.com

MDM

- In the context of business intelligence, the goal of **master data management** is to bring together and exchange master data such as customer, supplier or product master data from disparate applications or data silos. Master data management is needed …
- … because aside from a "master" ERP system, many companies work with other CRM or SCM systems or Web services. Master data management assures data consistency across these systems;

Source: Bi-Survey.com

MDM

- … to easily integrate systems following corporate mergers and acquisitions;
- … to cooperate effectively with business partners;
- … to provide an optimal customer experience;
- … to build a 360 degree customer view that addresses customer needs in the best way possible;
- … to merge on-premise and cloud-based systems.

Source: Bi-Survey.com

Data-driven Culture

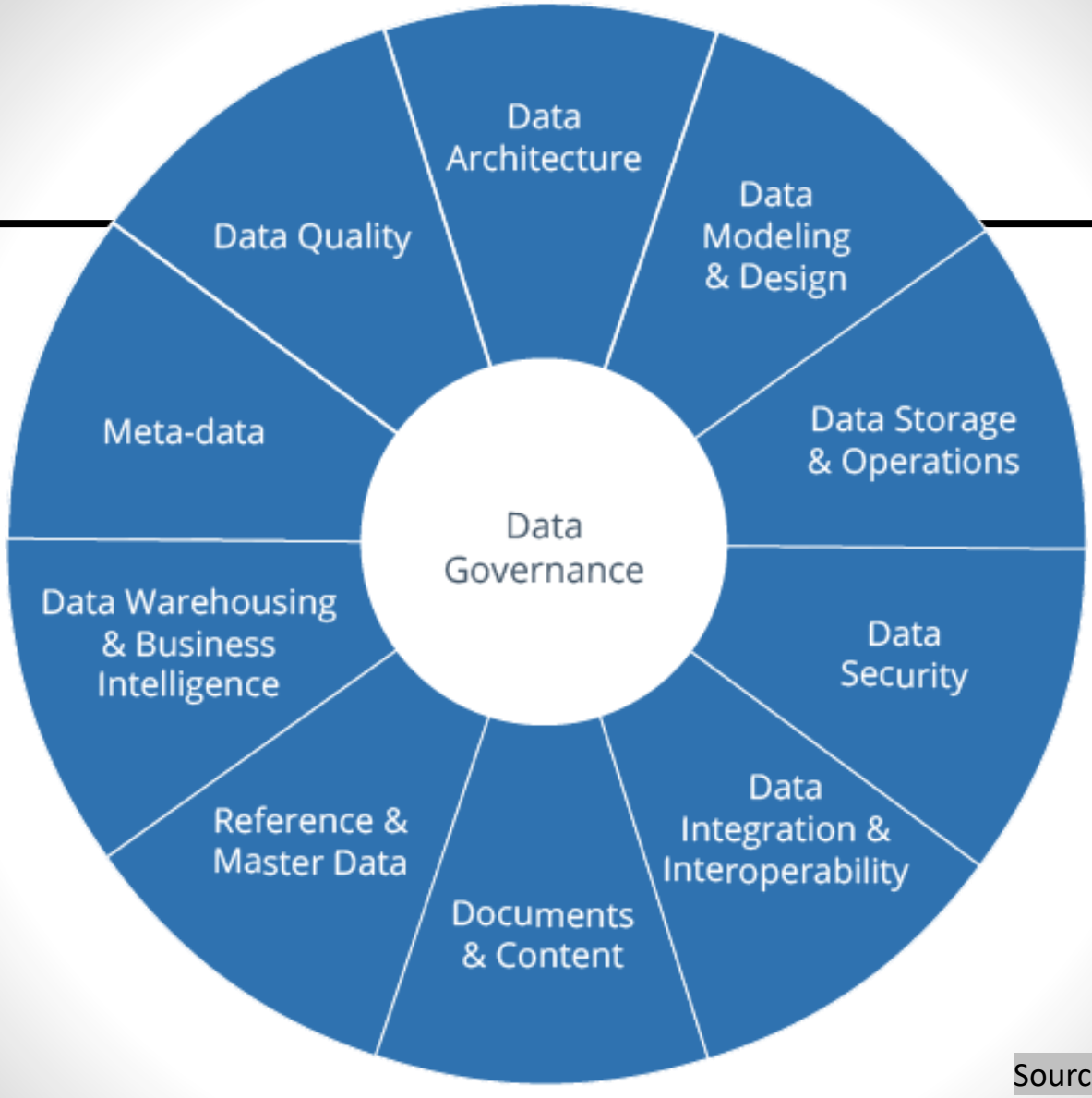
- Creating a data-driven culture is about replacing gut feeling with decisions based on data-derived facts, be they simple key figures such as revenue or profit, results from advanced analytics models, or even qualitative data.

Source: Bi-Survey.com

Data Governance

- Data Governance includes the people, processes and technologies needed to manage and protect the company's data assets in order to guarantee generally understandable, correct, complete, trustworthy, secure and discoverable corporate data.

Source: Bi-Survey.com



Source: Bi-Survey.com

Re-Skilling / Up-Skilling FP&A

FP&A BOARD
Experts Coming Together to shape FP&A Future

HARD SKILLS	SOFT SKILLS	DIGITAL SKILLS
Strategic Planning	Problem-Solving	Understanding of new tools
3-way forecast	Multifunctional	'Virtual' Manager
Programming (Python, VBA)	Customer-Centric	Data-driven FP&A

HOW?

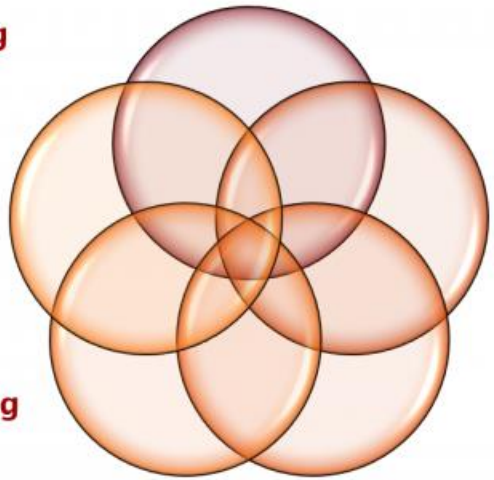
- SHARE BEST-PRACTICES BENCHMARK
- EDUCATE
- ROTATE ACROSS FUNCTIONS
- ENCOURAGE INNOVATION

5 Facets of the "New Normal" FP&A

FP&A BOARD
Experts Coming Together to shape FP&A Future

5. FP&A Recruitment
- Roles
- Skills

1.Scenario Planning
- quick
- flexible
- real time
- multidimensional



4. Digital FP&A:
Moving to the Leading Analytical Stage
- Agile
- Adaptable
- Quick

2. Cash Flow Planning
- Drivers
- Systems
- Collaboration

3. FP&A Teams and Collaborative Planning
- Multifunctional
- Multiskilled
- Collaborative Technology

https://fpa-trends.com/report/fpa-future-new-normal-switzerland

What happened? (descriptive analytics)	7%
How and why did it happen? (diagnostic analytics)	22%
What will happen next? (predictive analytics)	46%
What to do to make it happen? (prescriptive analytics)	20%
What did I learn, what is best? (cognitive analytics)	5%

Skills in Demand

DIGITAL FP&A BOARD

Technical

- Modeling
- Forecasting
- Reporting
- Accounting

Technology

- Predictive-based analytics
- AI/RPA
- Cloud

Nontechnical

- Collaboration
- Communication
- Persuasion
- Problem-solving

Robert Half®

How Can Technology Help Us Implement AI/ML and Predictive Analytics for Good Forecasting

DIGITAL FP&A BOARD

Overcome reluctancies

Do we need Data Science skills?

Cause of concern:

- I need to recruit statisticians
- Finance professionals need new advanced training to understand how to use Machine Learning

How technology must respond:

- Solve the complexity behind the scene
- Provide plug & play approach
- Visualise results and allow intuitive interaction

Do we need to redesign the planning process?

Cause of concern:

- Waste of investment done so far
- New huge investment for implementation and assistance
- Long time-to-production

How technology must respond:

- Allow smooth introduction: incremental approach
- Plug & play
- Add new value to an existing value chain

Do I have to believe a calculated prediction?

Cause of concern:

- Black box approach
- Loose of control on business drivers

How technology must respond:

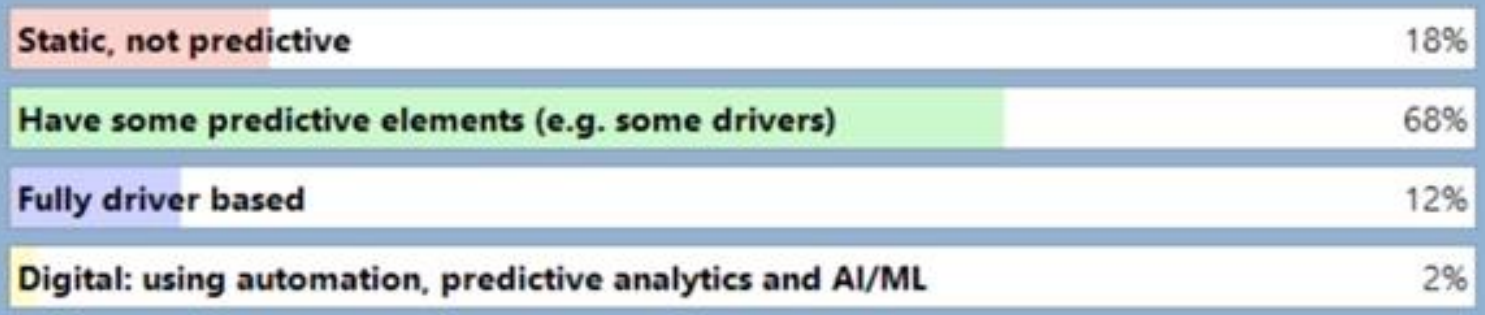
- Explain prediction
- Score driver
- Trigger conscious what if analysis

Source: Fabrizio Tocchini, The Digital Swiss FP&A Board (Nov. 2021)

QUICKPOLL

How would you describe your current FP&A Process?

Poll Results (single answer required):



The Accountant Position

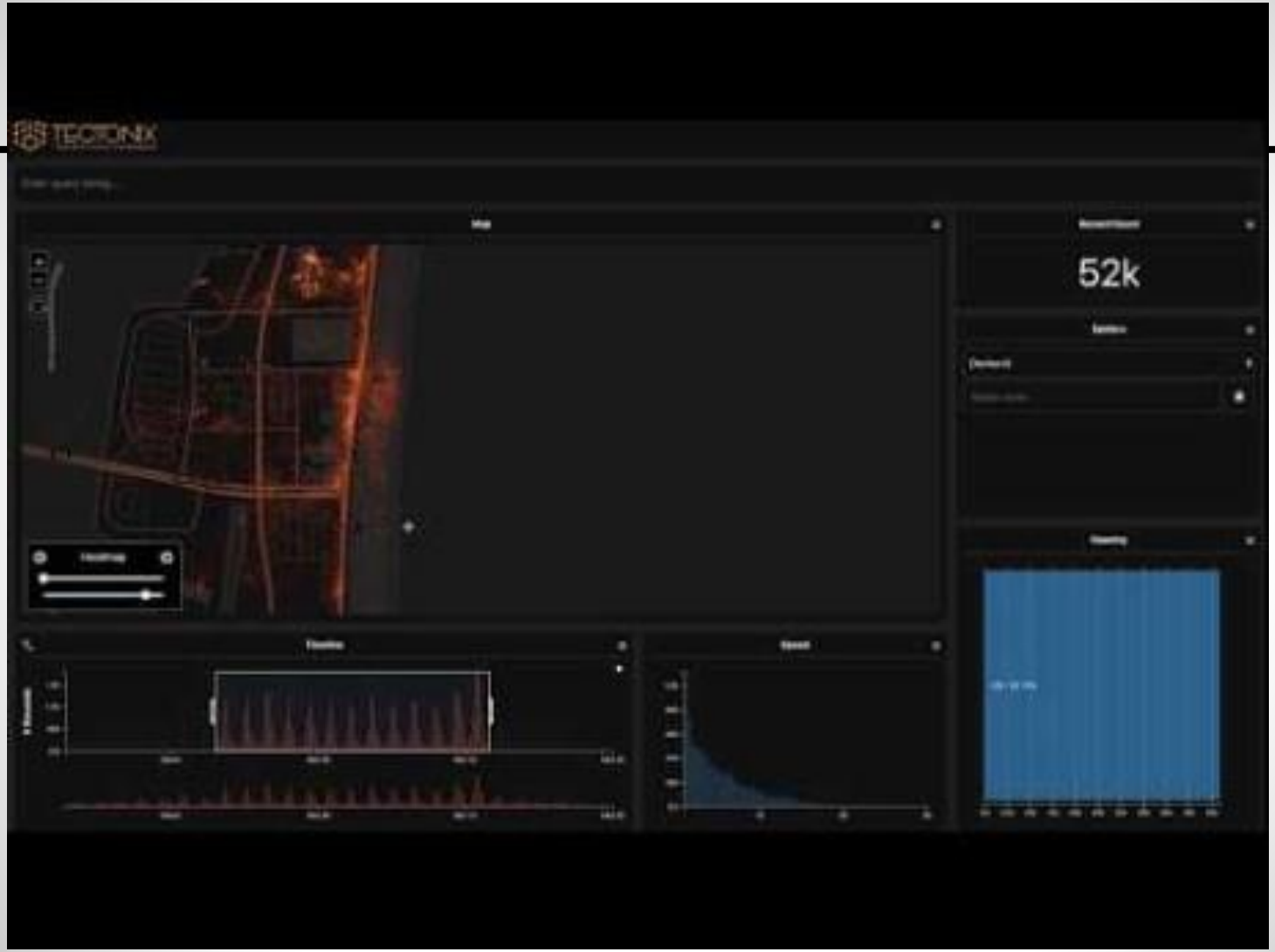
The Story is in the Data

Data Scientist

- Use trends to predict the future, explore data from numerous sources
- Emphasis on programming, statistical skills, machine learning, mathematics and algorithmic techniques
- Goal to derive insight by digging through large piles of raw data

Data Scientist

- Use this insight to develop “evidence-based analytical accuracy and strong decision capabilities
- Excellent communication skills and data visualization skills
- Develop the business questions that data looks to solve



Data Analyst

- Takes the business questions created by the data scientist and business team and finds the data and tools to solve them.
- Process and perform analysis on the data.
- Use the data to draw conclusions and solve problems.
- Package the data for use by others in the form of data reports.

Data Storyteller

- Use data visualization to communicate the information in a way that everyone can understand

Data discovery - Visualization

da·ta dis·cov·ery

/ˈdeɪtə dɪsˈkʌvəɹi/, *n* <comp>
is the business user driven and iterative process of discovering patterns and outliers in data.

What is data discovery?

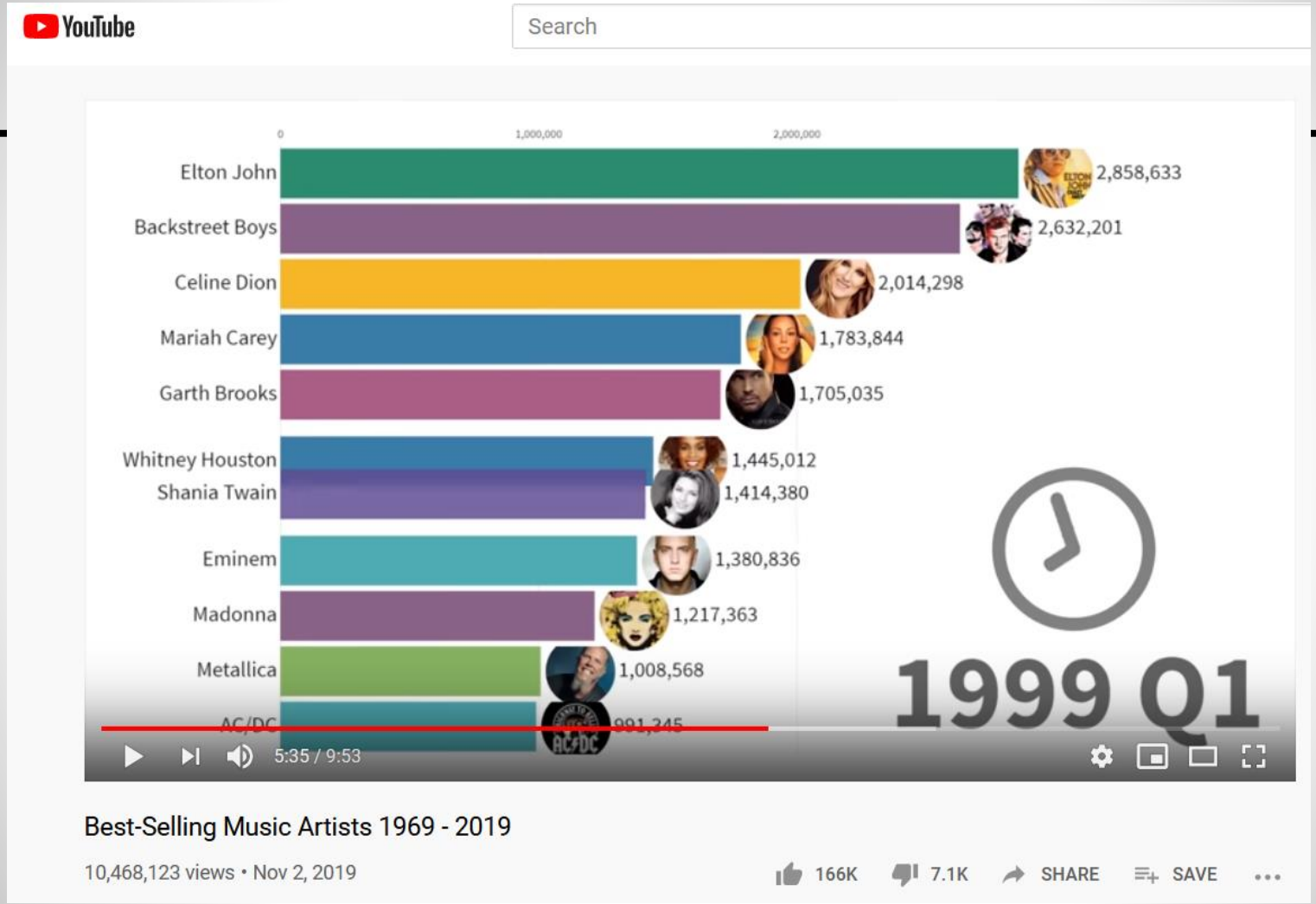
- **Data discovery** is not a tool. It is a business user oriented process for detecting patterns and outliers by visually navigating data or applying guided advanced analytics. Discovery is an iterative process that does not require extensive upfront model creation and has three main categories:
  - data preparation;
  - visual analysis; and
  - guided advanced analytics.

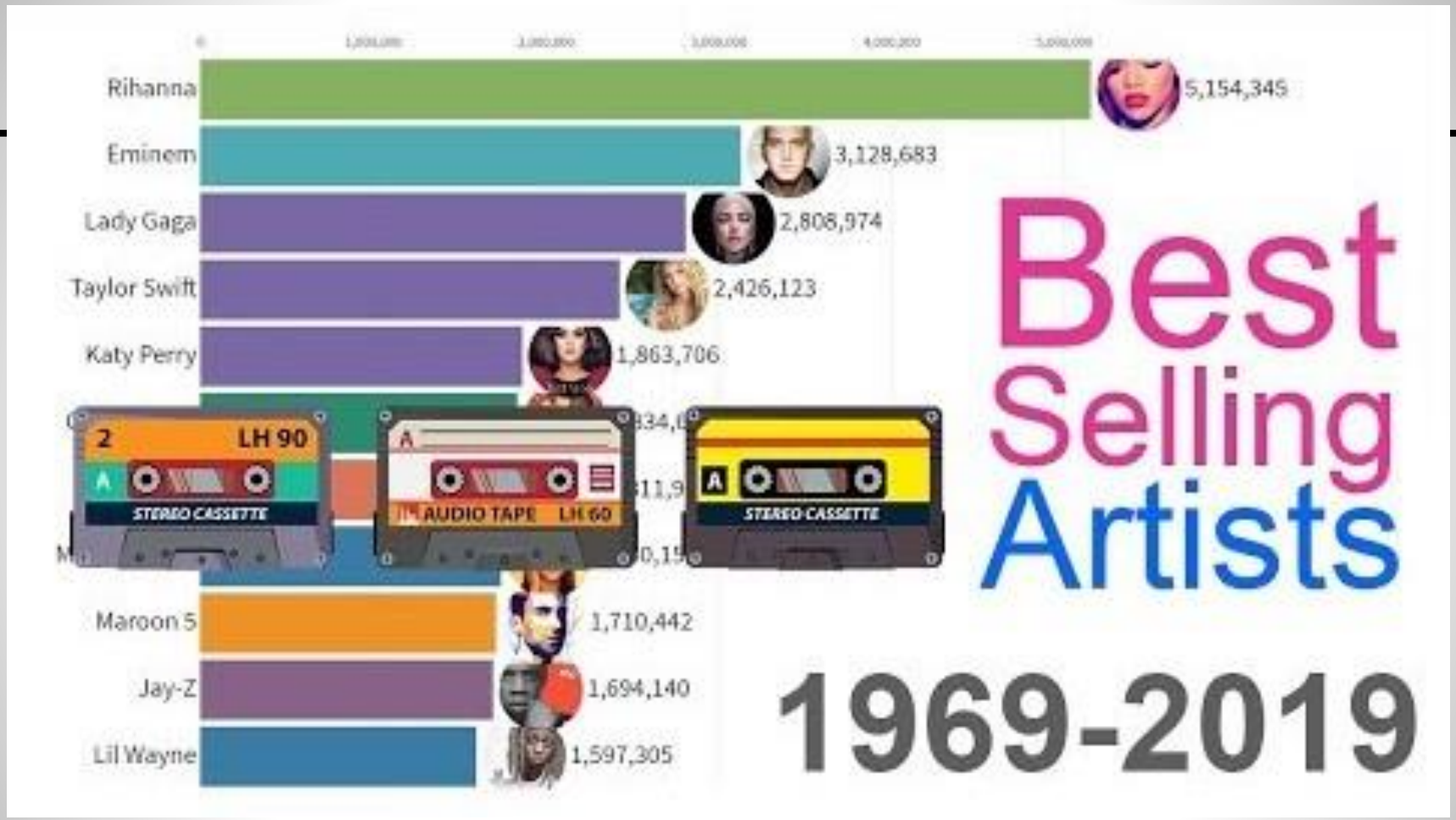
What is data discovery?

- Data discovery requires skills in understanding data relationships and data modeling as well as in using data analysis and guided advanced analytics functions to reveal insights.
- Data integration and data preparation capabilities.
- Interactive and new visualization types enable decision-makers to see, within an instant, major trends, as well as spot outliers.

What is data discovery?

- Visualizations make use of our brains' pattern recognition capabilities to digest information at a glance or even pre-attentively. Users are better at finding insights and detecting outliers if data is presented in charts and graphs on one page, versus being buried in data tables spanning multiple pages.
- Visual analysis is an important feature that is increasingly being sought by enterprises seeking more efficient ways for decision-makers to absorb and act on data.





Resources for Data Discovery

- CDC
- NIH
- FRED
- SEC
- Data.GOV
- SimFin

Software platforms & Trends

- Gartner Magic Quadrant
- Gartner Hype Cycles

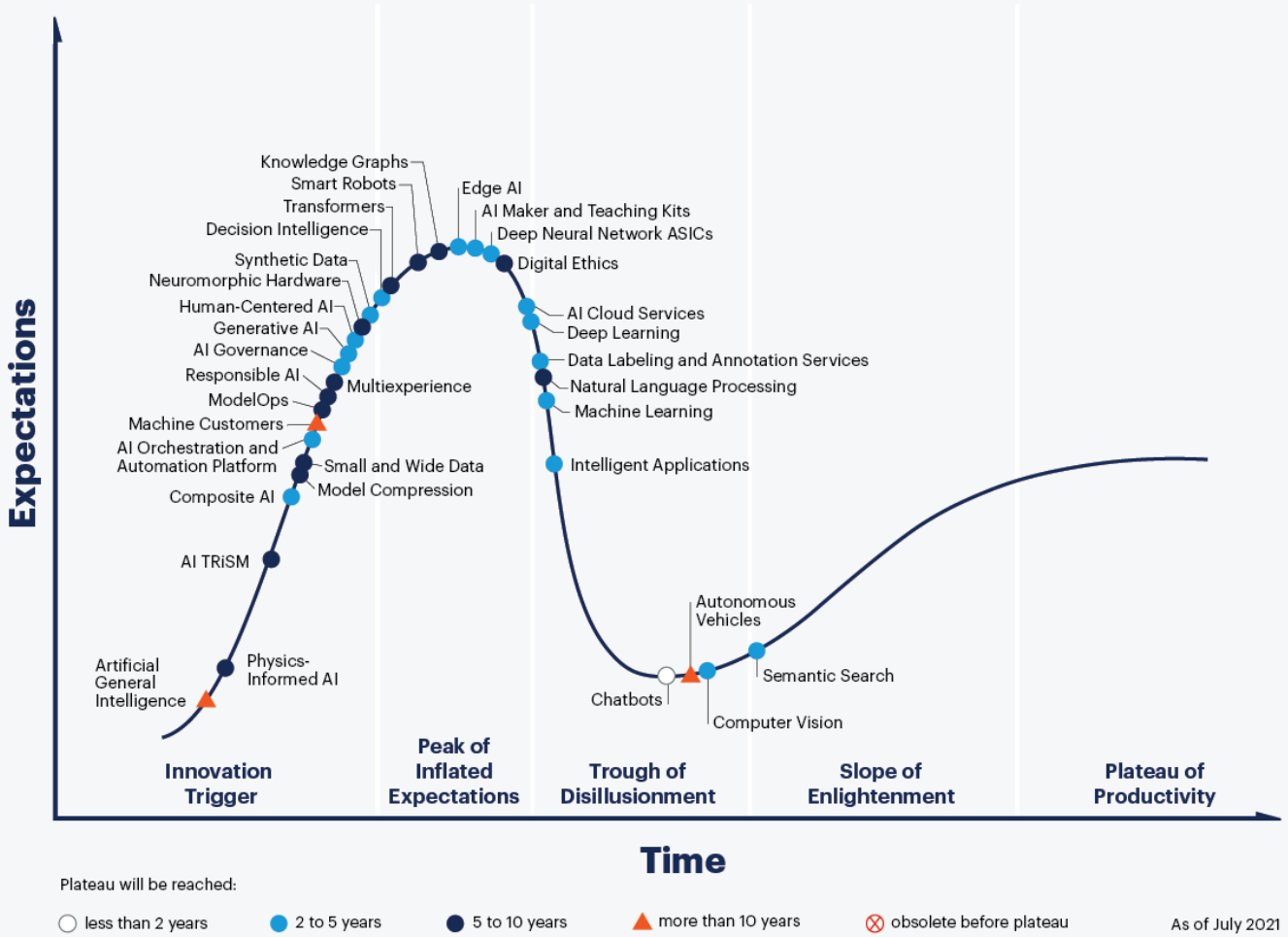
Figure 1: Magic Quadrant for Analytics and Business Intelligence Platforms

Source: Gartner (March 2022)

Magic Quadrant for Analytics and Business Intelligence Platforms.

Source: Gartner (Feb 2019 and 2020)

Hype Cycle for Artificial Intelligence, 2021



gartner.com

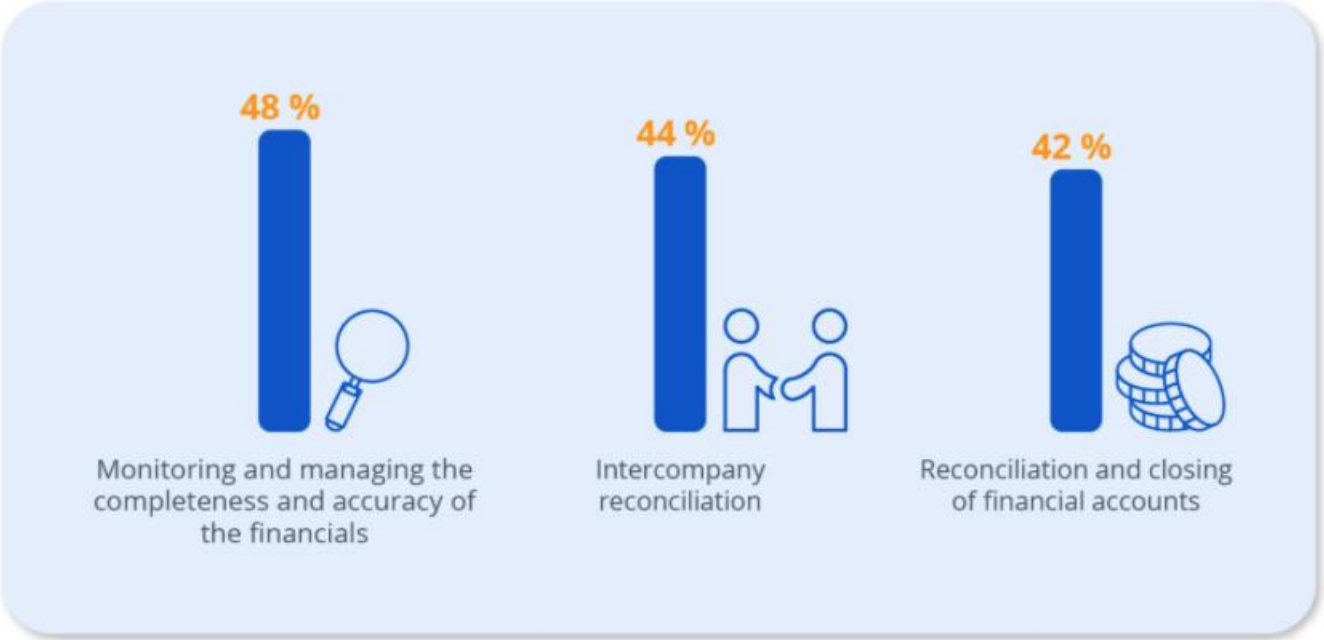
Source: Gartner

Gartner

BARC

Reconciliation and closing cause bottlenecks

Still the most critical processes in terms of processing time and effort are...



BARC

Home Research

The majority would like to standardize their ERP system, but in many cases this is not a realistic scenario. We recommend assessing alternative solutions.
The digitalization of group accounting is more than standardizing and automating repetitive, rule-based tasks. Automating recognition and closing is a major factor in driving satisfaction and increasing quality.

Automate routine and repetitive tasks

Harmonize finance IT system chain

Communication collaboration

Integrated framework compliance

Data availability and quality

Corporate culture and change management

Audit reliability and collaboration

Continuous monitoring and compliance

Group account process standardization

BARC Survey

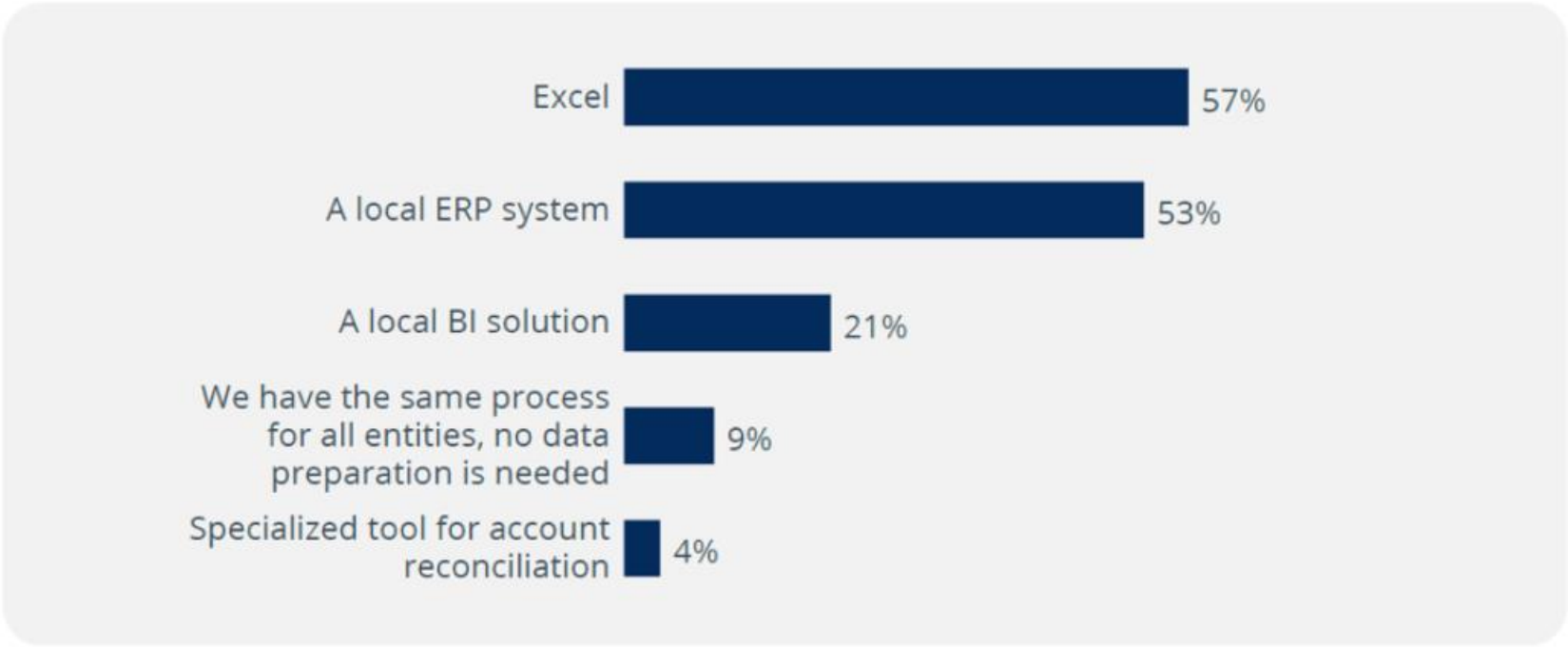


Figure 1: What are you using for data and closing preparation in single entities? (n=110) © BARC

http://barc-research.com/press-release-fast-close-movement-not-over/

BARC - Survey

http://barc-research.com/press-release-fast-close-movement-not-over/

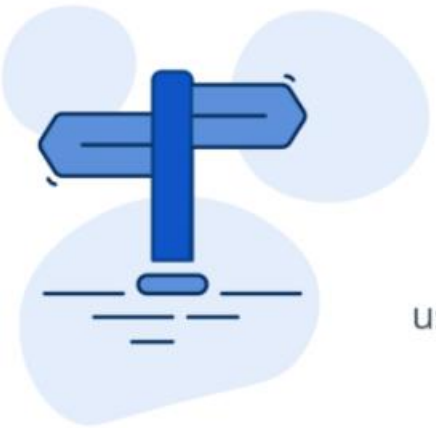
Figure 2: What challenges do you see for account closing and reconciliation in the next 3 years (n=59), by best-in-class © BARC

Excel – continued use in close

Data preparation and closing is still done in

57 %

of companies with Excel – regardless of the size of the company.



Only

4 %

use specialized IT tools.

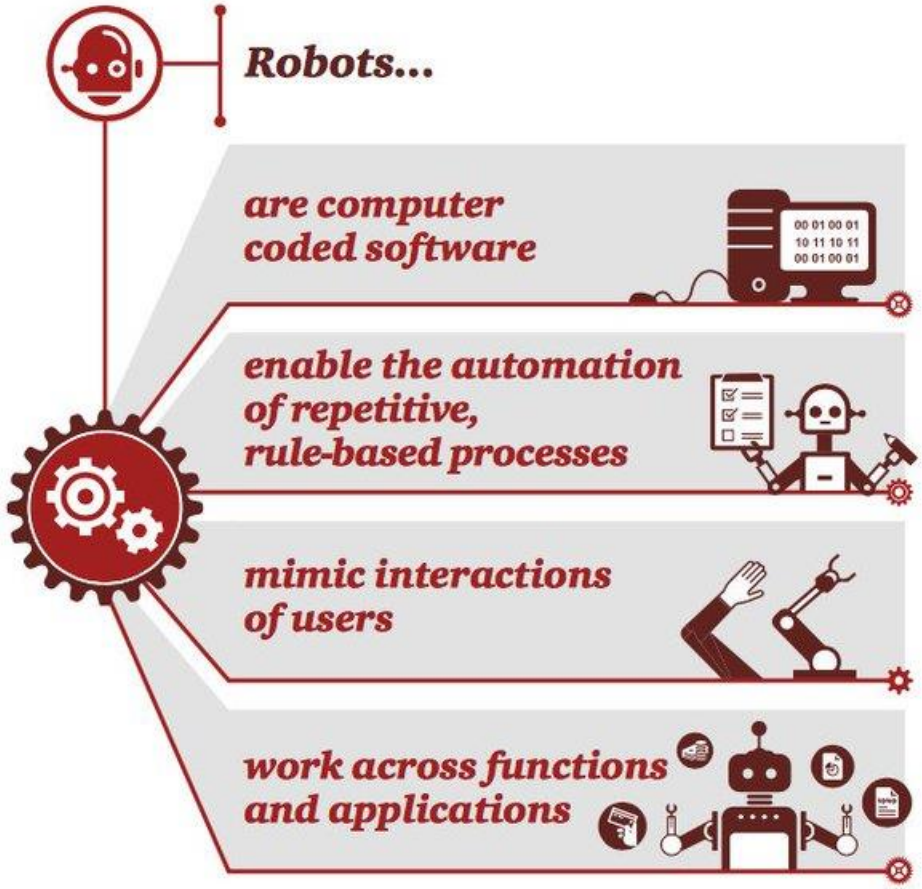
http://barc-research.com/press-release-fast-close-movement-not-over/

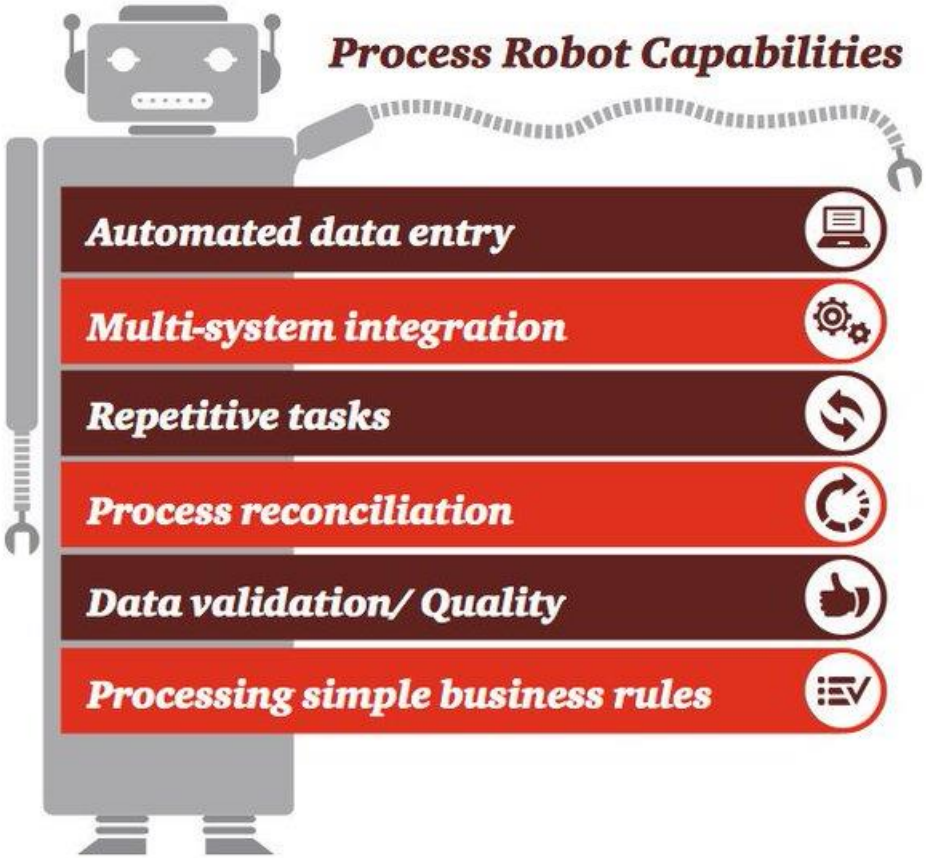
Accounting application of BI and DA

- 7 Ways AI helps to digitize the accounting & finance tasks.

What is Robotic Process Automation (RPA)?

RPA is a feature of intelligent process automation (IPA) that describes logic driven robots executing pre-programmed rules on mostly structured data. RPA takes productivity optimization to the next level by redefining work and reassigning employees to execute higher-value activities. Process bots are capable of independently performing simple human-like functions such as interpreting, deciding, acting, and learning.

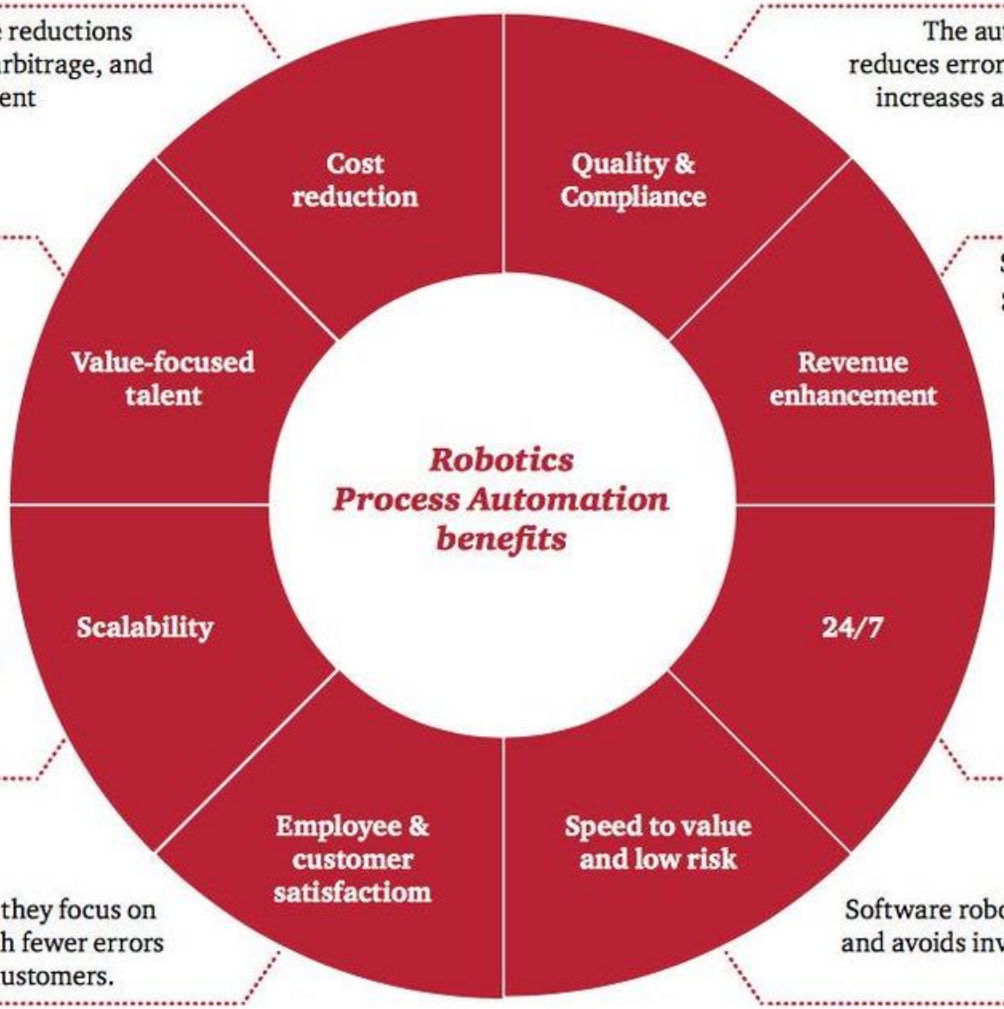




source pwc via @mikequindazzi

Automation and robotisation

The benefits of RPA are wide-ranging.



Software robotics brings immediate reductions in operational cost, beyond labour arbitrage, and generates a rapid return on investment (e.g. nine-month pay back).

The automated nature of software robotics reduces errors and leaves a digital audit trail that increases accuracy and regulatory compliance, enabling programmable controls.

The priorities of the employee workforce will shift to innovation, strategy and other business development activities.

Software robotics increases revenue growth by shortening the cycle time to serve customers.

A virtual workforce can respond to growth events (e.g. organic, acquisitive) with speed, agility, and resiliency. Robots are managed from the control room and require little IT expertise.

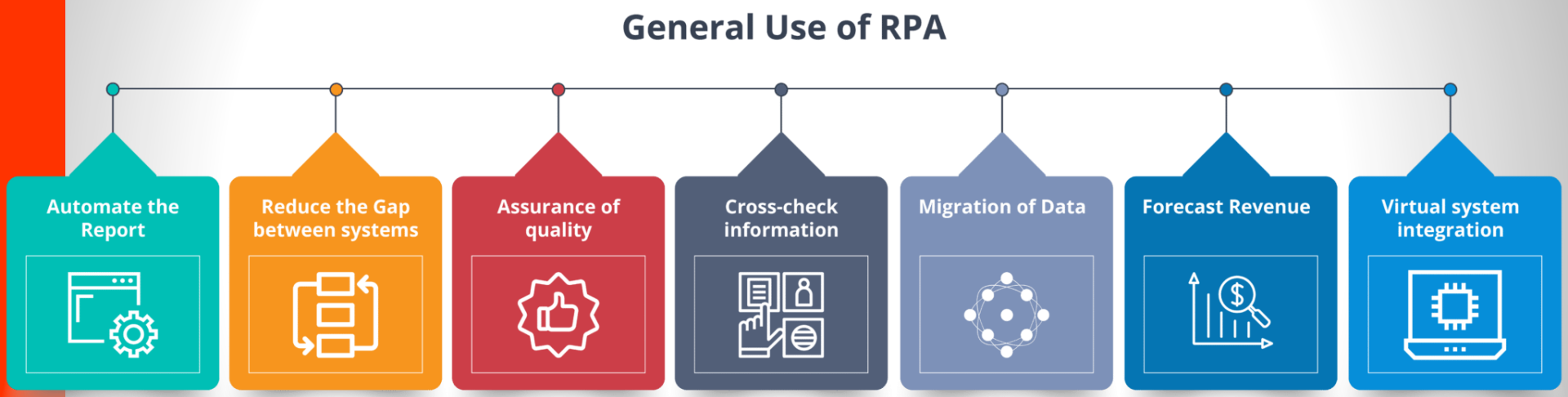
Robots never sleep and many of today's digitally-enabled processes can operate autonomously 24/7, driving real-time transactions.

Increased employee satisfaction (as they focus on higher-value activities) together with fewer errors will result in increasingly satisfied customers.

Software robotics accelerates the time to delivery and avoids invasive traditional system integration – weeks or months instead of years.

source pwc via @mikequindazzi

General Use of RPA



Robotic Process Automation

System based on Rules: Automate easy tasks

1. Access Legacy Systems
2. Screen Scrapping
3. Automate form fills
4. Copy data from one system to other

Make Data Available for Machine Learning

Machine Learning

Learn
Feature Extraction
Data Classification

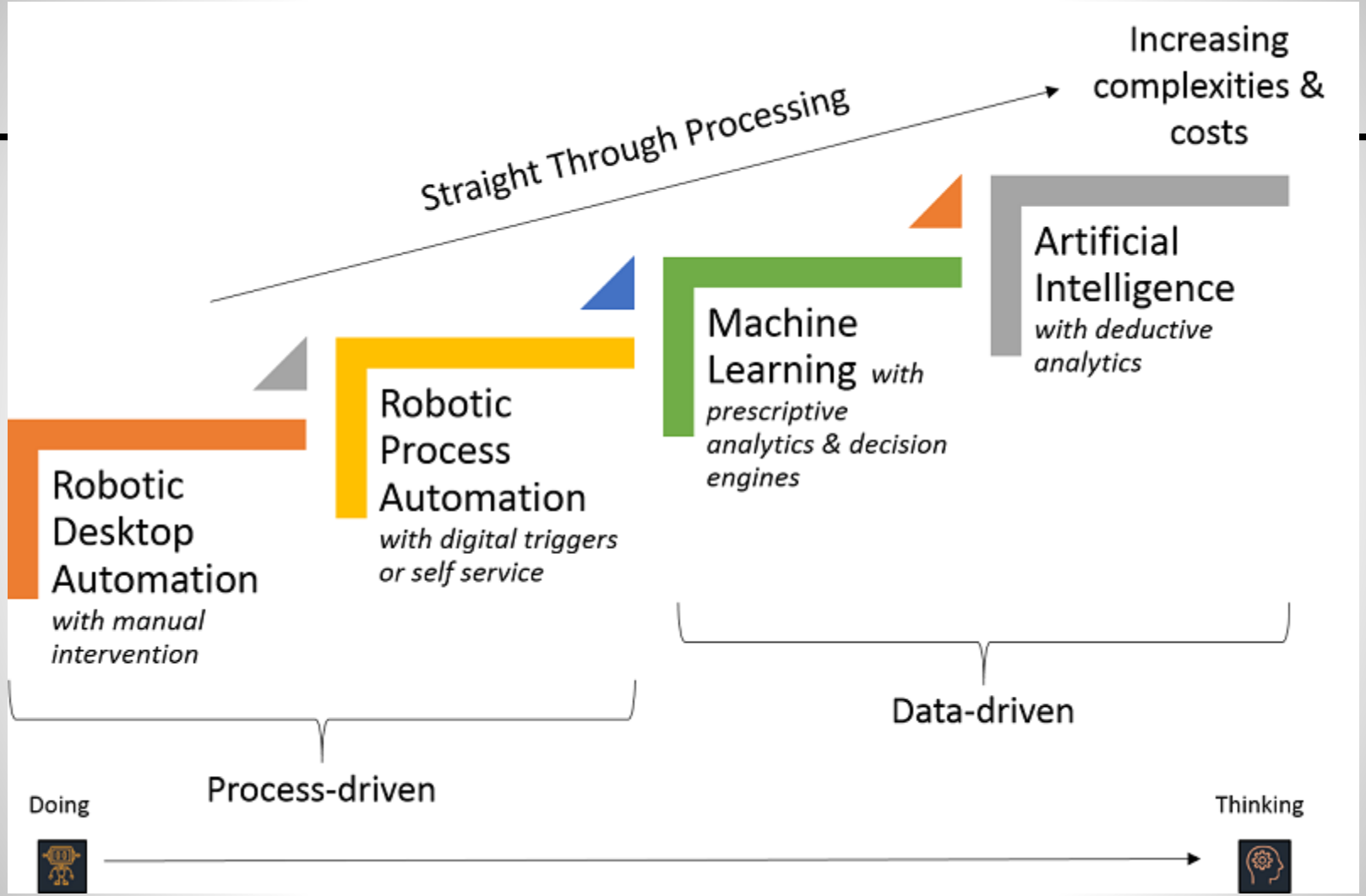
Artificial Intelligence

Mimic Humans

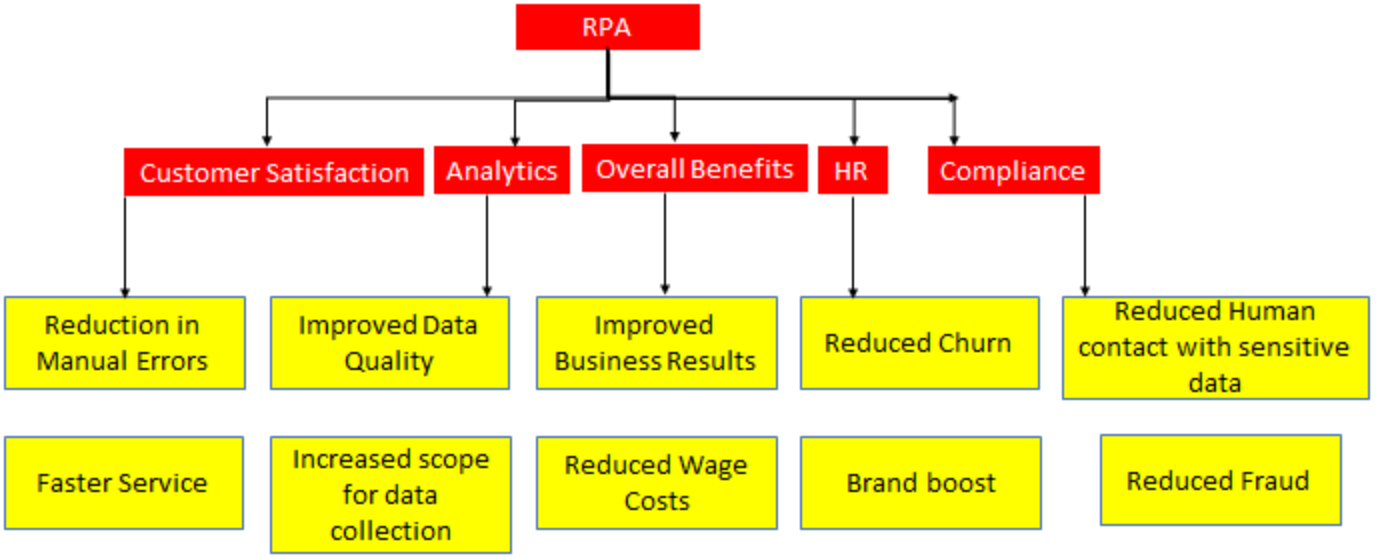
1. Making Fast Judgements
2. Interact with Humans
3. Perform Tasks

Continuously Improve Performance

Ashok Gairola



Benefits of Robotic Process Automation (RPA)



#Disrupt 4.0

CELLSTRAT

Why Robotic process automation?

- Frees accounting time up for more people-centric tasks
- Allows more room to create more value-added work

Robotic Process Automation

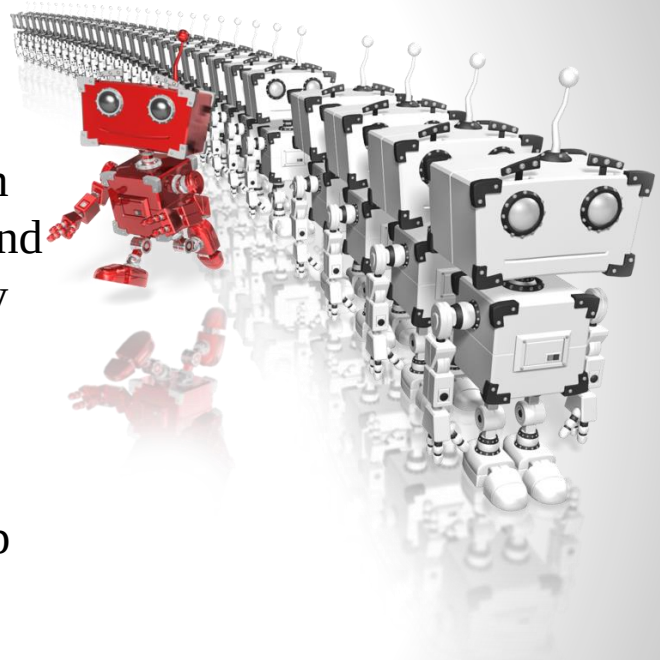
Machines mimic manual tasks:

- Chat bots
- Pepper PARLOR, a café in japan where three different types of robots serve customers (with a few humans).
  - Semi-humanoid robot named Pepper does most of the customer interaction, greeting, and taking orders.
- Baseball team is filling stadium with 500 robot spectators. Taiwan's CPBL (Chinese Professional Baseball League) Rakuten Monkeys have robotic mannequins sitting in the stadium for the upcoming game.

Kristin Houser, "Cafe Staffed by Robots Opens in Japan," Futurism, December 5, 2019, https://futurism.com/the-byte/cafe-robots-opens-japan.
Victor Tangermann, "A Baseball Team Is Filling Its Stadium with 500 Robot Spectators," Futurism, April 7, 2020, https://futurism.com/the-byte/baseball-team-robot-spectators.

Robotic Process Automation, cont.

- What Remote works means for RPA
- "A new employee needs to create a new task in a CRM system they have never used. Provide them with a bot that performs all the necessary clicks and keystrokes to take them to exactly to the spot they need to be in the CRM system."
- An example of what we will likely see is from Automation Anywhere. The company recently launched its Discovery Bot, which uses AI to map and optimize processes by tracking keystrokes, mouse movements and other actions within applications.



Tom Taulli, "Remote Working: What It Means for RPA (Robotic Process Automation)," Forbes, April 4, 2020, https://www.forbes.com/sites/tomtaulli/2020/04/04/remote-working-what-it-means-for-rpa-robotic-process-automation/#80562fc3f996.

Robotic Accounting and using RPA in the accounting department

Benefits of robotic accounting

- Non-invasive application
- Customizable workflow
- Nonstop performance
- Consistency and reduced errors in work
- Major lifting
- Ease and speed of installation

The Lab Consulting, "Robotic Accounting – 5 Use Cases, a Case Study, and Examples of RPA in Finance and Accounting Departments," The Lab Knowledge Work Factory, July 7, 2018, https://thelabconsulting.com/robotic-accounting-5-use-cases-case-study-examples-rpa-finance-accounting-departments/.

Case study of robotic accounting

THE LAB
KNOWLEDGE WORK FACTORY

HOME SERVICES ABOUT

Cathy works in Accounts Receivable, and she's responsible for uploading her company's invoices to a Sharepoint website for their customers to pay. She normally processes each invoice manually, which takes 5-10 minutes per invoice depending on the customer. In the current-state (pre-RPA) process, she has to separate Excel files from xml files (in a folder created automatically by SAP), zip the xml files (invoices) and then upload these invoices to a Sharepoint website for their customers to access.

The pre-RPA estimate use case process is as follows:

- SAP automatically saves invoices to a specific network folder, depending on the customer.
- Cathy opens Explorer and navigates to the folder created for today's invoices.
- She selects all xml files, being sure to not choose any Excel files.
- She zips these xml files into one folder.
- While Windows zips the folder, she waits.
- When the folder is zipped, she navigates to the appropriate website to upload the files.
- She logs into the website.
- She uploads the newly created zip folder containing the invoices to be paid.

This is tedious work, performed by multiple employees every day for numerous customers.

With the help of robotics, however, Cathy's repetitive job is going to be very different. The RPA use case will now process the work as follows:

- SAP automatically saves invoices to a specific network folder, depending on the customer.
- Cathy starts the UiPath AR robot.
- UiPath asks Cathy to choose the correct folder for today's invoices (folders change daily).
- UiPath then automatically navigates to the folder that Cathy has chosen.
- UiPath searches for and then selects all xml files.
- UiPath zips all xml files to one folder on the desktop.
- A pre-set delay allows Windows enough time to zip the folder (zip time depends on the number of files).
- UiPath then navigates to the company's invoice site, logs in with Cathy's username and password, chooses "upload file" and uploads the zip folder full of invoices.
- After uploading, UiPath deletes the zip folder from the desktop to reduce desktop clutter.

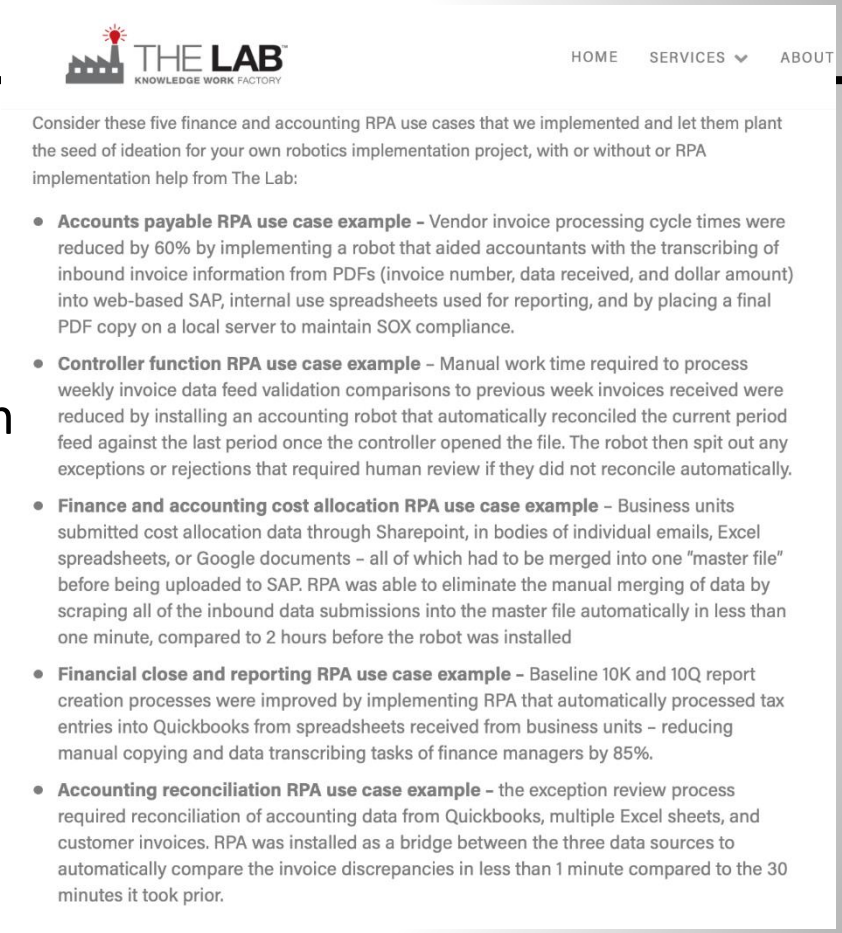
The above steps (1-9) only took a few clicks of a button compared to the 50+ clicks required before RPA.

It used to take Cathy 5-10 minutes to zip and upload invoices, but now it takes her 2 minutes—saving an average of 7 minutes per invoice. Cathy used to spend a large portion of her day just zipping and uploading invoices. Now she has time to focus on more important matters. With RPA, she can "set it and forget it." The AR robot does most of the work for her.

The Lab Consulting, "Robotic Accounting – 5 Use Cases, a Case Study, and Examples of RPA in Finance and Accounting Departments," The Lab Knowledge Work Factory, July 7, 2018, https://thelabconsulting.com/robotic-accounting-5-use-cases-case-study-examples-rpa-finance-accounting-departments/.

Other robotic accounting applications

- Accounts payable
- Controller function
- Finance and accounting cost allocation
- Financial close and reporting
- Accounting reconciliation



THE LAB KNOWLEDGE WORK FACTORY

HOME SERVICES ABOUT

Consider these five finance and accounting RPA use cases that we implemented and let them plant the seed of ideation for your own robotics implementation project, with or without or RPA implementation help from The Lab:

- **Accounts payable RPA use case example –** Vendor invoice processing cycle times were reduced by 60% by implementing a robot that aided accountants with the transcribing of inbound invoice information from PDFs (invoice number, data received, and dollar amount) into web-based SAP, internal use spreadsheets used for reporting, and by placing a final PDF copy on a local server to maintain SOX compliance.
- **Controller function RPA use case example** – Manual work time required to process weekly invoice data feed validation comparisons to previous week invoices received were reduced by installing an accounting robot that automatically reconciled the current period feed against the last period once the controller opened the file. The robot then spit out any exceptions or rejections that required human review if they did not reconcile automatically.
- **Finance and accounting cost allocation RPA use case example** – Business units submitted cost allocation data through Sharepoint, in bodies of individual emails, Excel spreadsheets, or Google documents – all of which had to be merged into one "master file" before being uploaded to SAP. RPA was able to eliminate the manual merging of data by scraping all of the inbound data submissions into the master file automatically in less than one minute, compared to 2 hours before the robot was installed
- **Financial close and reporting RPA use case example –** Baseline 10K and 10Q report creation processes were improved by implementing RPA that automatically processed tax entries into Quickbooks from spreadsheets received from business units – reducing manual copying and data transcribing tasks of finance managers by 85%.
- **Accounting reconciliation RPA use case example –** the exception review process required reconciliation of accounting data from Quickbooks, multiple Excel sheets, and customer invoices. RPA was installed as a bridge between the three data sources to automatically compare the invoice discrepancies in less than 1 minute compared to the 30 minutes it took prior.

The Lab Consulting, "Robotic Accounting – 5 Use Cases, a Case Study, and Examples of RPA in Finance and Accounting Departments," The Lab Knowledge Work Factory, July 7, 2018, https://thelabconsulting.com/robotic-accounting-5-use-cases-case-study-examples-rpa-finance-accounting-departments/.

Gartner 2020 Morphing RPA

Overview

Key Findings

- Organizations have paid for an expensive patchwork quilt of applications and systems. Business executives are demanding a path to digital operational excellence. The net result is a tremendous pent-up demand to democratize process automation and data integration. Robotic process automation (RPA) fulfills a need but requires strategy, guardrails and governance.
- Hyperautomation refers to an approach in which organizations rapidly identify and automate as many business processes as possible. It involves the use of a combination of technology tools, including but not limited to machine learning, packaged software and automation tools to deliver work.
- RPA offerings are in the midst of market disruption. New offerings, new vendors and new commercial models are emerging rapidly. The largest RPA providers are using their significant capital resources to add complementary components in an attempt to distinguish themselves. Similarly, vendors in adjacent categories are delivering new RPA-oriented functionality.

Gartner Morphing RPA (cont.)

Recommendations

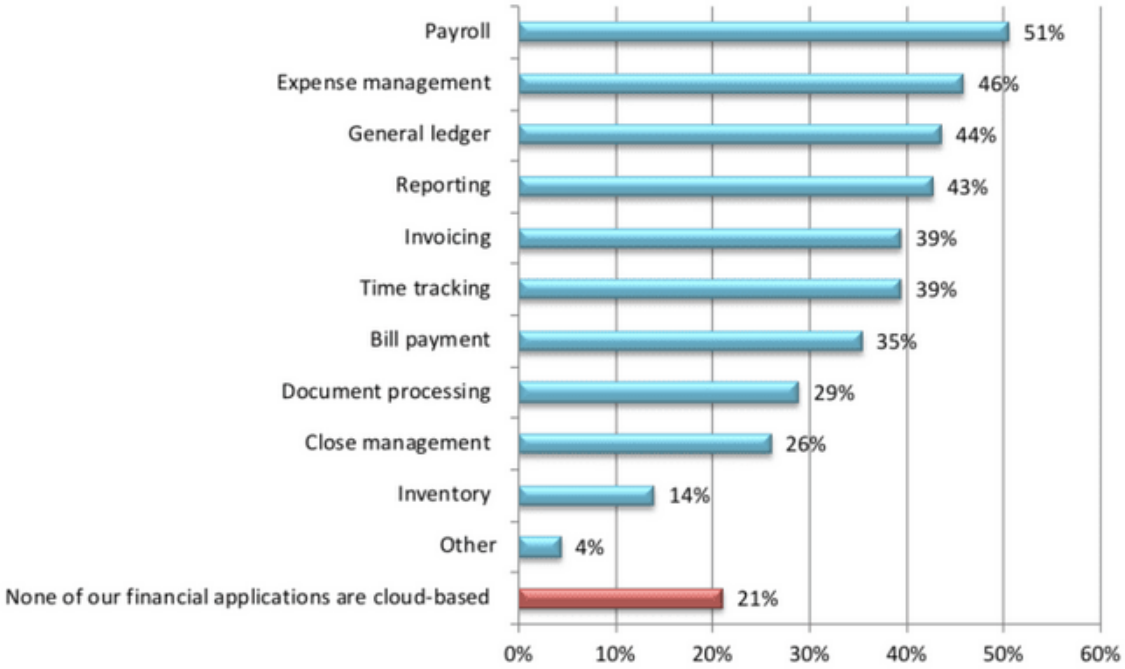
IT leaders responsible for sourcing RPA offerings (services and solutions) should:

- Drive organizational adoption and avoid potential missteps on the hyperautomation journey by engaging business units, IT, security and assurance functions into a process automation governance board. This will help drive organizational adoption and avoid potential missteps on the hyperautomation journey.
- Plan your hyperautomation journey by focusing on a wider spectrum of business functions and knowledge work. Strategize and architect across the toolbox of options, including RPA, iBPMS, iPaaS and decision management tools. This is the only way to effectively leverage related components (for example, process mining, analytics, user experience and machine learning).
- Avoid the hype with rigorous due diligence of RPA offerings and their ecosystems. Focus on the providers' abilities to address outcomes critical to your organization across multiple areas. Assess vendor process models carefully as seen with Microsoft's entry into these offerings that changed the marketplace dynamics significantly — especially for the small and midsize business (SMB) sector.

HERE'S WHAT IT MEANS TO BE A "CLOUD ACCOUNTANT"

According to a new survey of 506 accounting and finance professionals commissioned by FloQast and conducted by Dimensional Research, 79 percent of accountants are using at least one cloud-based financial application. However, most of them are not yet what we would call true "cloud accountants."

What types of cloud-based or SaaS financial applications does your company use?



Accountants — Ffamiliarity

Familiar with the following:

- **Account name**
- **Account G/L code**
- **Transaction amount**
- **Vendor name**
- **SKU number**

Not familiar with the following:

- **Memo fields**
- **Miscellaneous fields that have not been accessed by traditional reports or databases**
- **Systems (like email) that are built with the data in an unstructured format**
- **Streaming data:**
  - **Social media discussions**
  - **Machine sensor data**

IMPROVING PEOPLE'S LIVES AND THEIR BUSINESSES

Examples — Big Data helps CFO

- Planning and forecasting
- Minimizing risk and fraud
- Advanced financial and management analytics and variance analysis
- Profitability modeling and optimization
- Financial system administration with comprehensive score carding using innovative data visualization
- Previously impossible financial, ratio and related information analysis that can lead to new insights, applications and enhanced company profitability and value

Specific areas

- AR
- AP
- Duplicate payment detection
- Sampling
- Data imports, extractions, and analysis of large data sets
- Continuous auditing and monitoring
- Fraud detection and monitoring
- Analysis of procurement cards
- Payroll and time sheets
- Joins and comparisons
- Inventory audits

Improving People's Lives and Their Businesses

Creative uses

- Hourly energy bidding analysis
- Analyzing client behaviors around periods of renewal
- Analyzing surveys provided by customers
- Measuring the adequacy of a promotional program
- Analyzing student enrollment
- Reviewing billing
- Foreign Corrupt Practice Act monitoring
- Evaluating fixed assets
- Integration of student data with online learning systems
- Appraising risks
- Medical bad debt analysis
- Testing data in different system logs
- Analyzing wire exceptions in banking
- Evaluating loans and analyzing portfolios

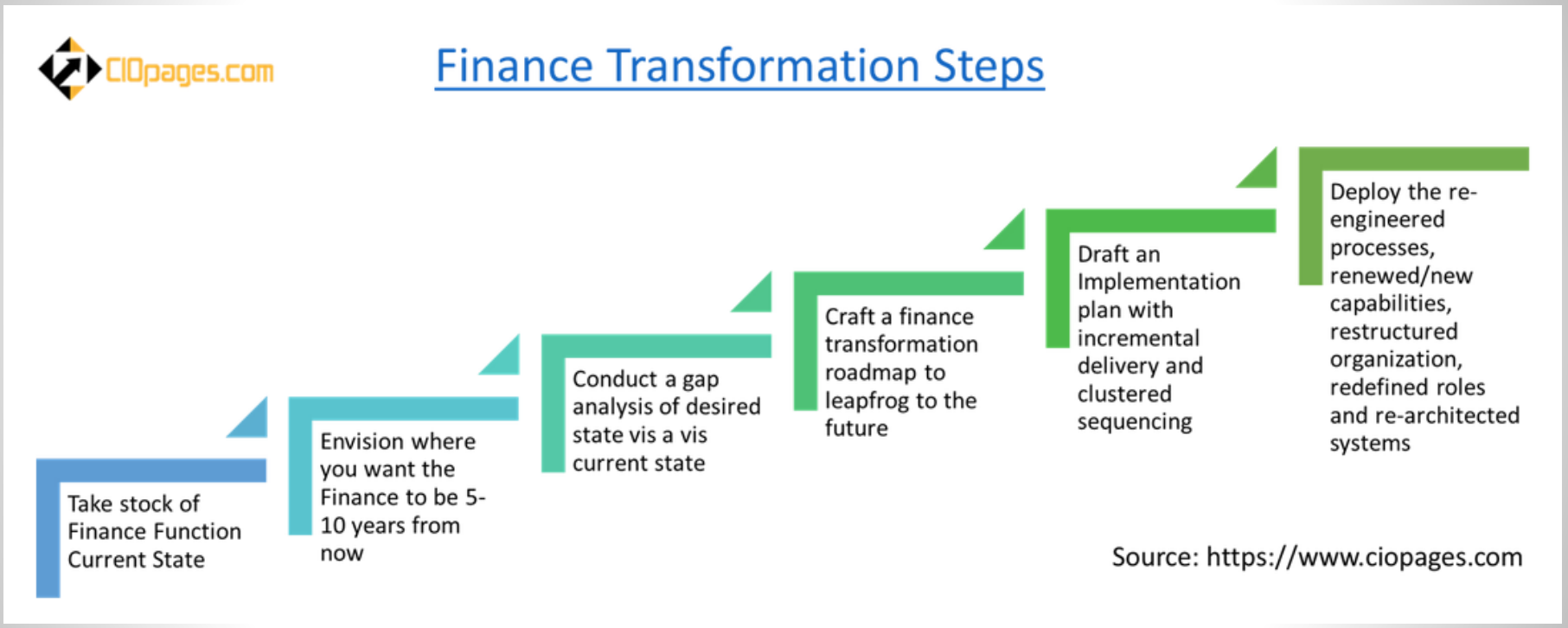
Other uses — Big Data and Analytics

- **Data Visualization**
- **AI and accounting**
- **Chatbots**
- **Reporting and data mining**
- **Natural language processing**

Reorienting accounting to a future-looking role

- Increase forecasting role
- Seek out industry trends on a regular basis
- Use historical data in novel ways
- Become an invaluable asset to the decision-making process
- Harness predictive analytics

Finance Transformation



How do you drive finance transformation?

- **Finance as a Strategic Enabling Function:**
- Long-term planning
- Strategic level Project budgeting
- Growth path alternatives analysis
- Management accounting
- M&A and divestiture support
- ROI Analysis on significant, strategic investments
- Optimal financing (to lower average cost of capital and hence stakeholder value)
- Risk management

How do you drive finance transformation?

- **Finance as a Back-Office Service Provider:**
- General Ledger
- Accounts Payable
- Accounts Receivable
- Payroll
- Cash management
- Revenue accounting
- Credit management

How do you drive finance transformation?

- **Finance as a Business Enabler:**
- Pricing analysis
- Business intelligence and decision support
- Forecasting
- Budgeting
- Profitability and margin analysis
- Working Capital management
- Management reporting

How do you drive finance transformation?

- **Finance as a Control Function:**
- Internal Audit
- Regulatory reporting
- Compliance management
- Internal controls
- Policies and procedures and guidelines
- Stress testing and business reviews

Ethical Considerations

- What data do you have in your organization that is sensitive? What data do you not realize that you have in your organization but may exist in Big Data unstructured format?

Ethical Considerations (cont.)

- Email archive
- Research and development
- Pricing and product expansion discussions
- Merger and acquisition
- Mobile device location
- Internet location history
- Unanalyzed transaction history components

Ethical Considerations (cont.)

- Data that are pushed by the owner to a provider (even with access permission) that the data owner is unaware of.
- Data that the user is aware of but has not given permission to access (like personal photos).
- Data that the user is aware of but never thought it would be used for such purposes, for example:
  - Insurance and health information, or
  - Texting status (especially when there is an accident).

Ethical questions (continued)

- Data that are collected from internet surfing patterns.
- Data embedded in other objects such as video, audio, or photo
- Ownership of Big Data generated by the individual that becomes part of a larger database
- Are the assumptions and conclusions that you or your company make about employees or prospective employees appropriate?
- What unstructured Big Data does your organization have that it is not using but could be used by someone else if they obtained access to it? (Think email.)

Self-Service BI

- What happens when end users replace the services that accountants used to provide?

Scotty

https://www.youtube.com/watch?v=LkqiDu1BQXY&feature=youtu.be

Data Analytics – The Story is in the Data!

- Microsoft BI
- Qlik
- Tableau

Power BI Desktop

With Power BI Desktop, you can:

- Connect securely to hundreds of data sources —in the cloud and on-premises
- Transform and mash up data from multiple sources—in just a few clicks
- Extend your data models with DAX formulas
- Choose from more than 100 cutting-edge data visuals—or create your own
- Dig deep into data to find patterns and discover insights
- Build out your design with intuitive formatting tools and themes
- Create mobile reports for on-the-go users
- Share visual analytics with everyone in your organization
- Publish securely to the web or an on-premises report server, or embed visuals in your website or app

Source:Microsoft.com

Power BI Desktop

Get data

Recent sources

SEC Dataset for Text prune...
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SEC Dataset for Text prune...
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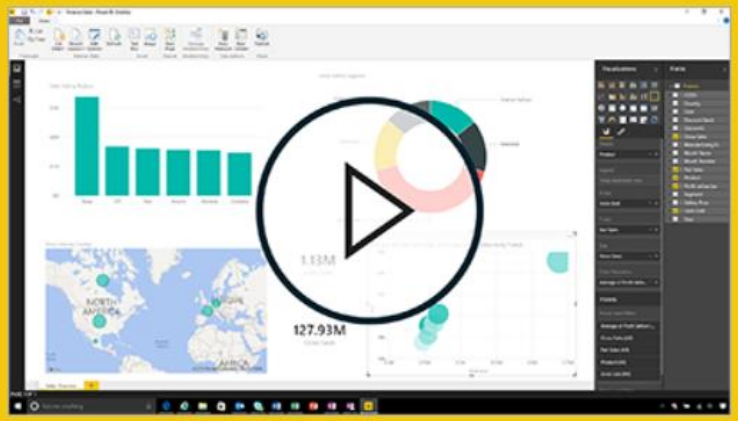
Open other reports

jim lindell



Getting started with Power BI Desktop

Building reports

Query view concepts

Uploading your reports

Create a Phone report

VIEW ALL VIDEOS

✓ Show this screen on startup

WHAT'S NEW

Take a look at what's new and improved in Power BI in this month's update.

FORUMS

Visit the Power BI Forum to ask questions or interact with other users in the Power BI community.

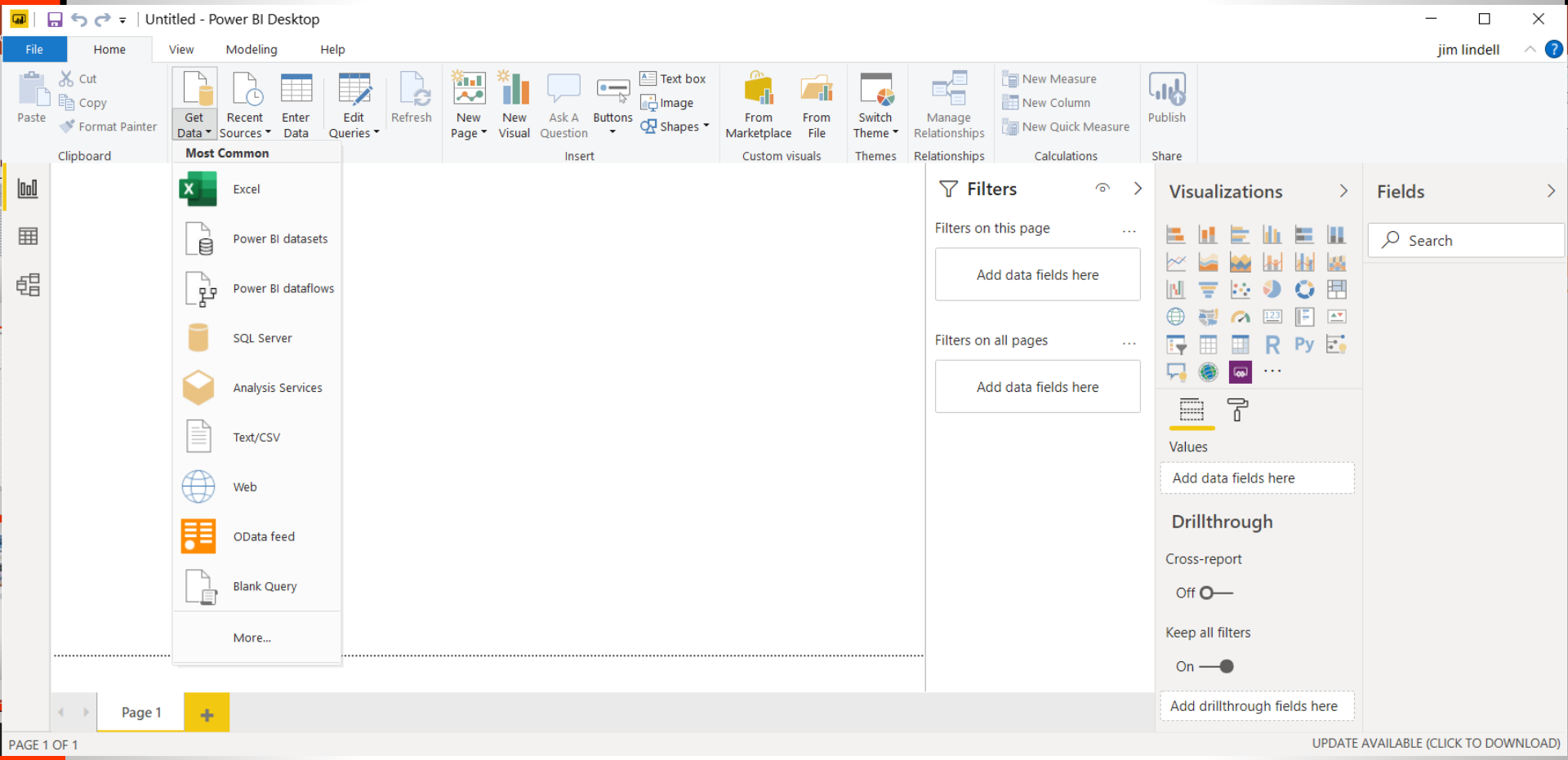
POWER BI BLOG

Keep up to date with the latest news, resources, and updates from the Power BI team.

TUTORIALS

Ready to learn more about Power BI?

- Get started with Power BI Desktop
- Download a sample
- Watch our training videos
- See what others have built
- All guided learning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Power BI dataflows
SQL Server
Analysis Services
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Filters
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Add data fields here
Filters on all pages
Add data fields here
Visualizations
Values
Add data fields here
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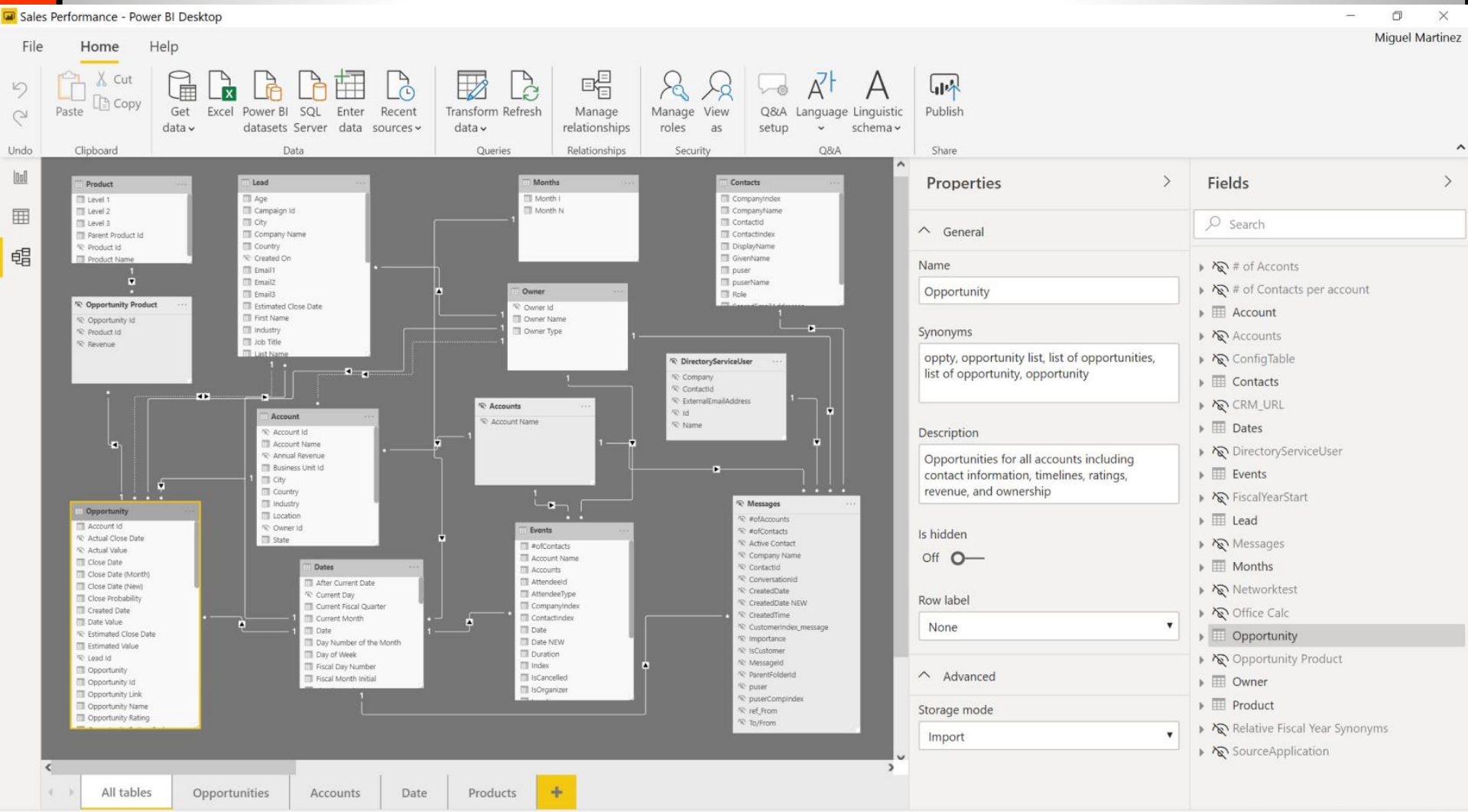
PAGE 1 OF 1
UPDATE AVAILABLE (CLICK TO DOWNLOAD)


Sales Performance - Power BI Desktop
Miguel Martinez
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Email3
Estimated Close Date
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Company Name
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Synonyms
oppty, opportunity list, list of opportunities, list of opportunity, opportunity
Description
Opportunities for all accounts including contact information, timelines, ratings, revenue, and ownership
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# of Contacts per account
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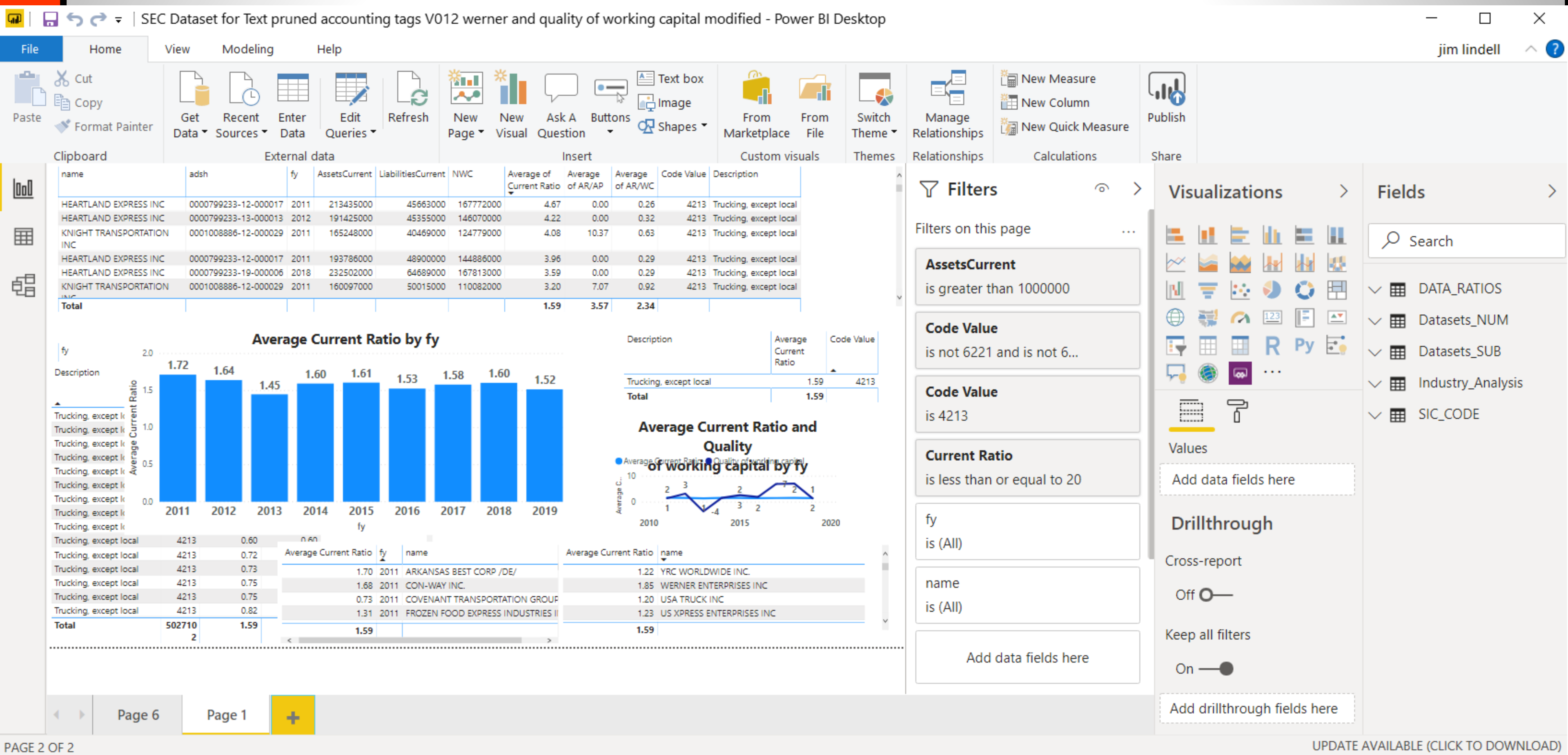
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From Marketplace
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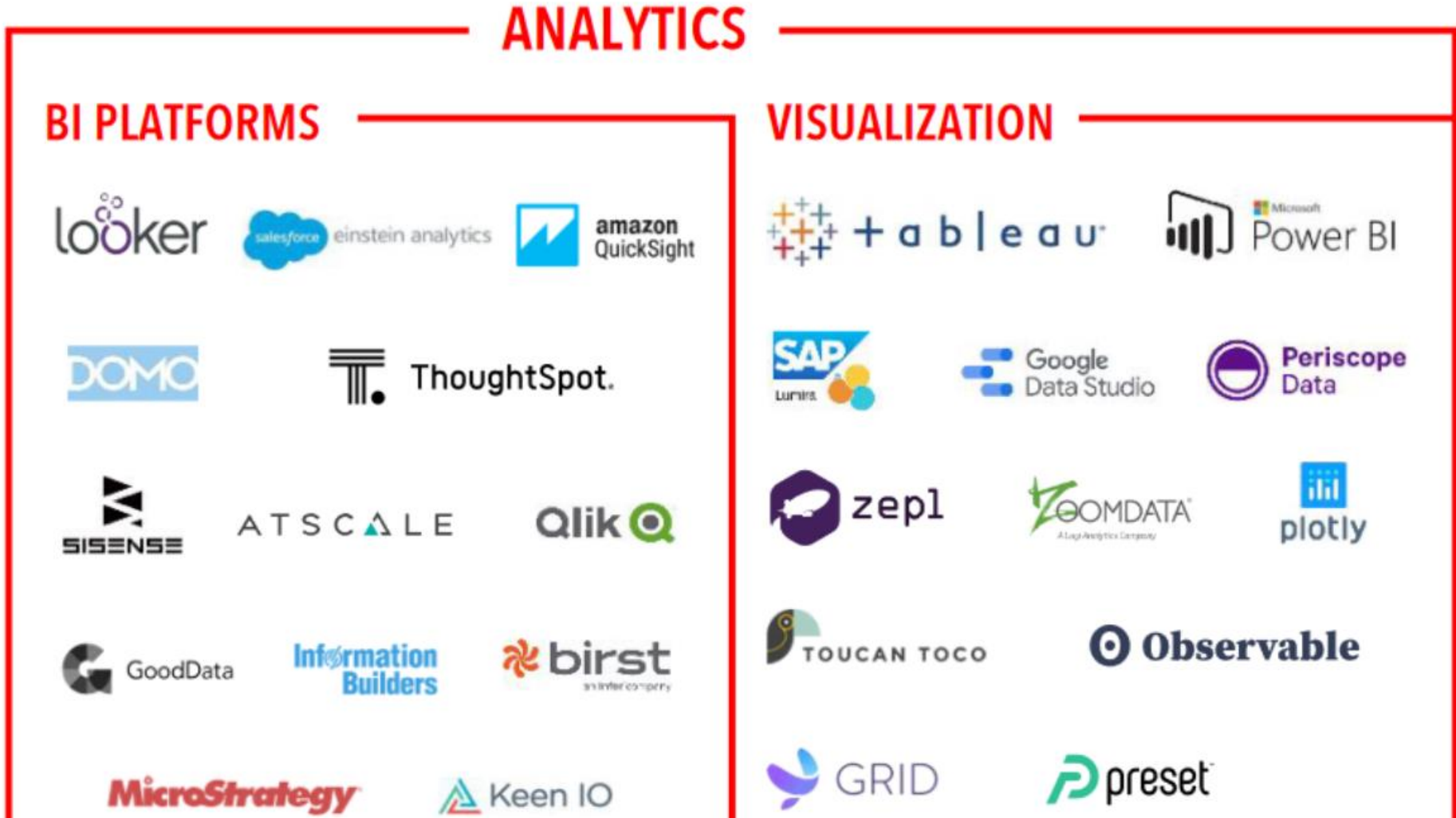
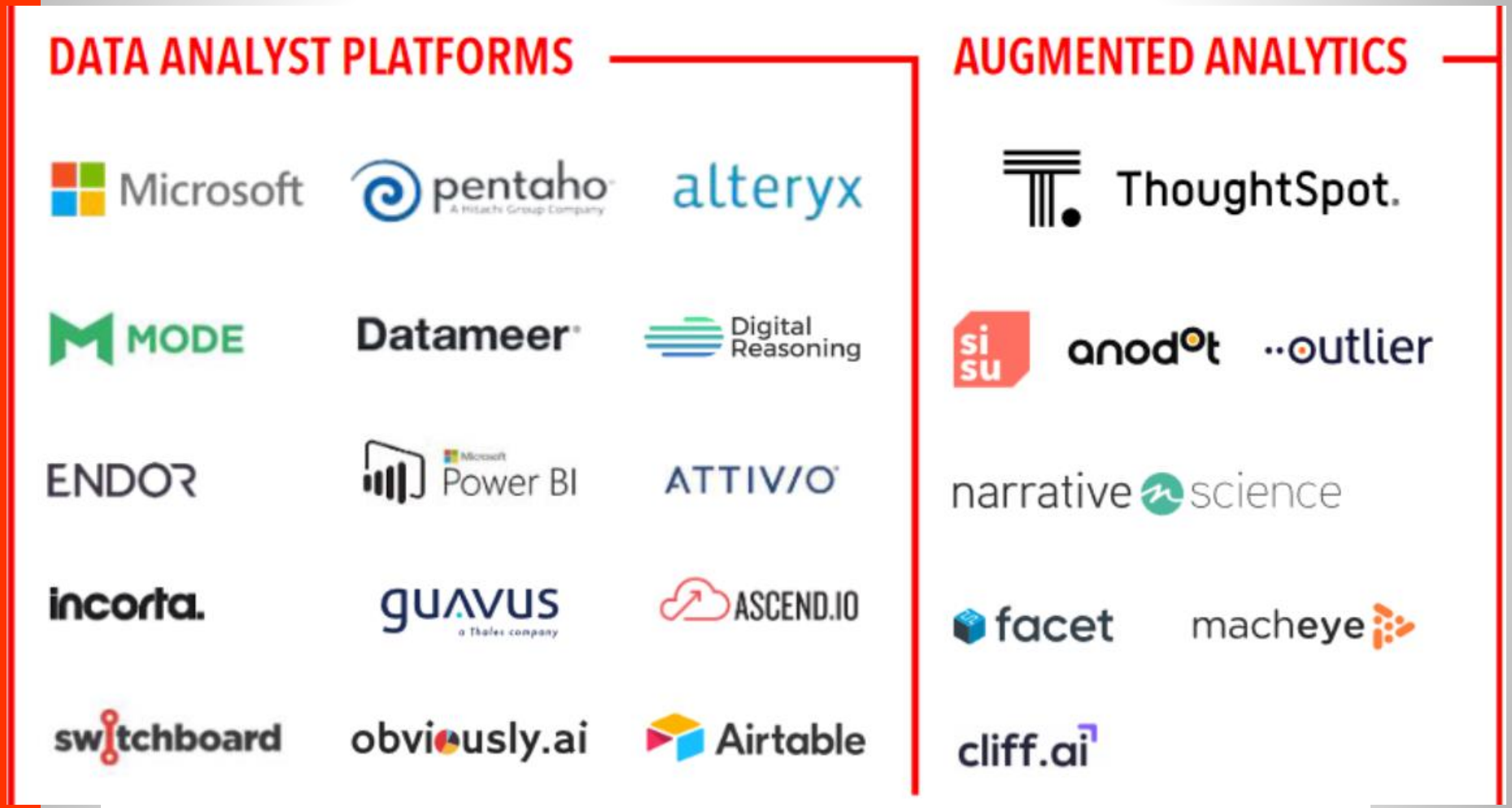
MACHINE LEARNING, ARTIFICIAL INTELLIGENCE, AND DATA (MAD) LANDSCAPE 2021





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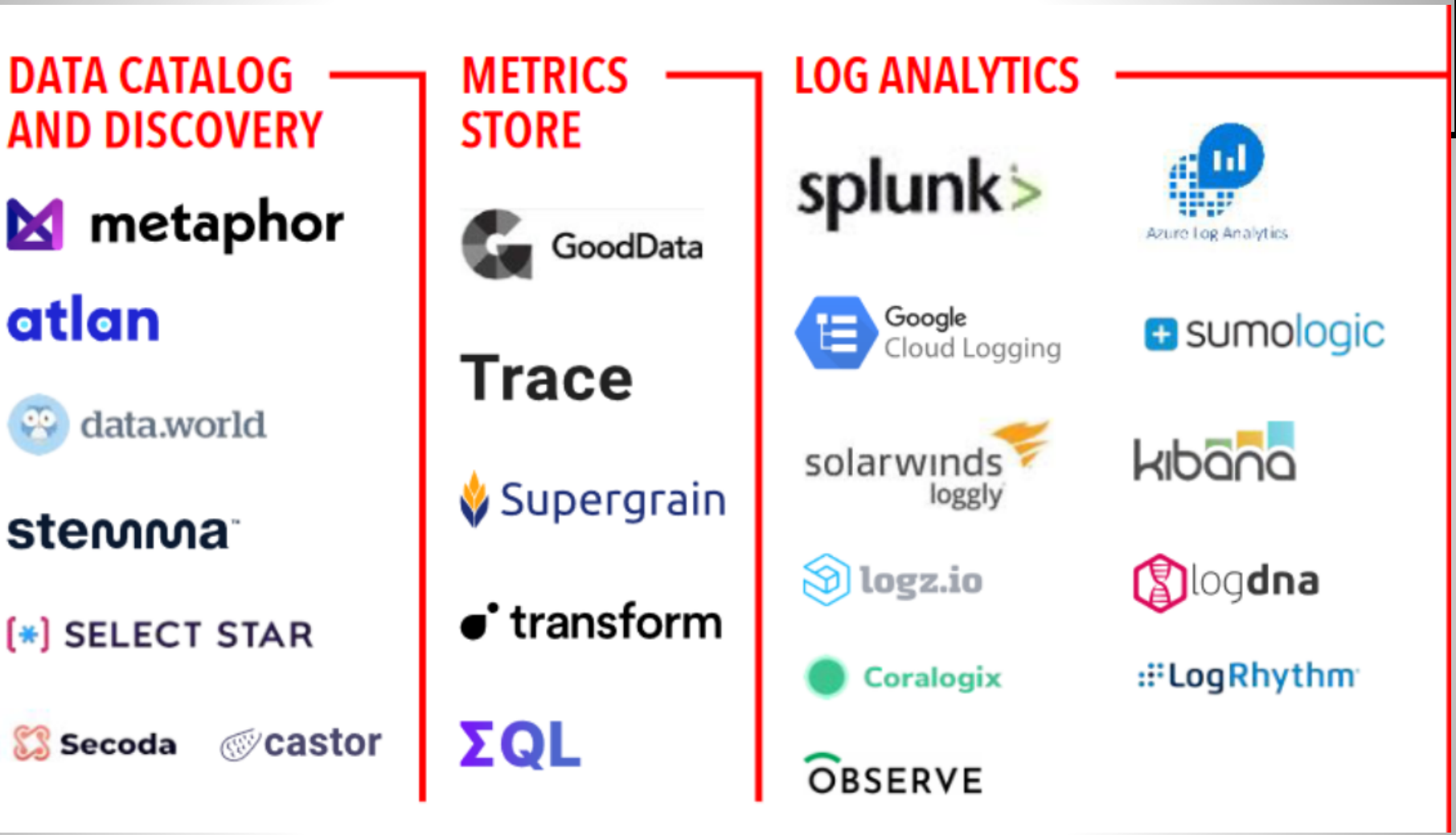

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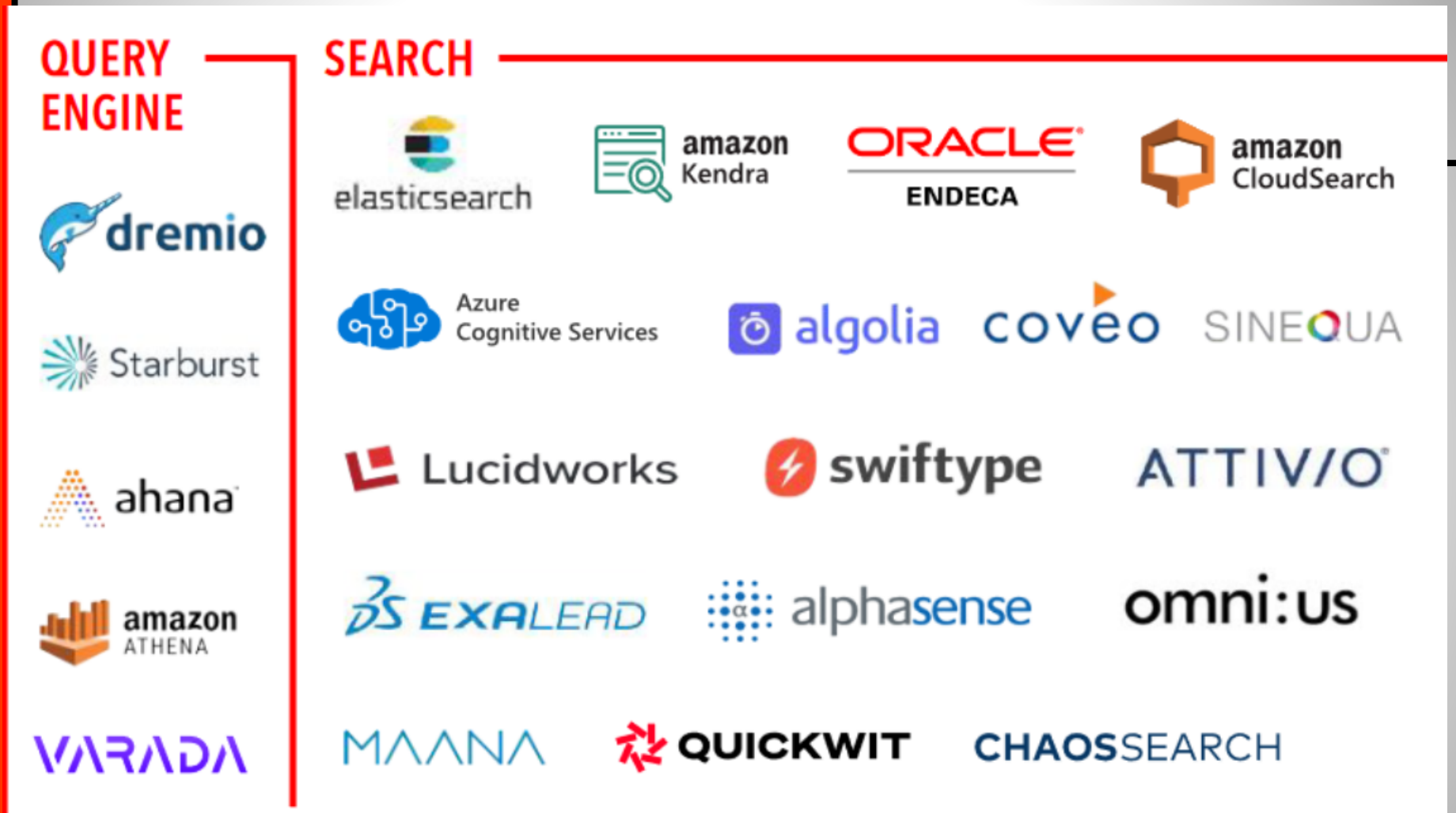

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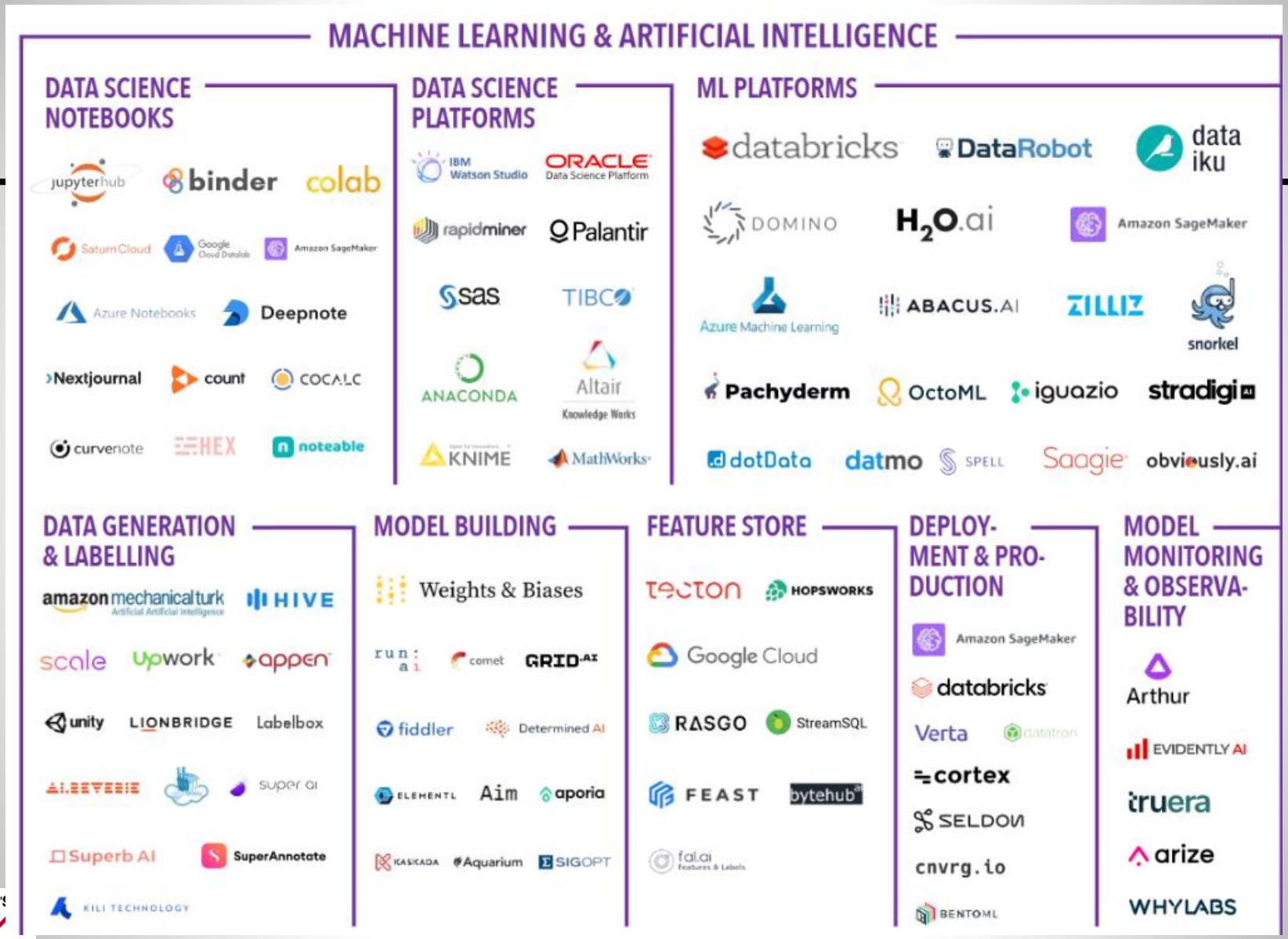

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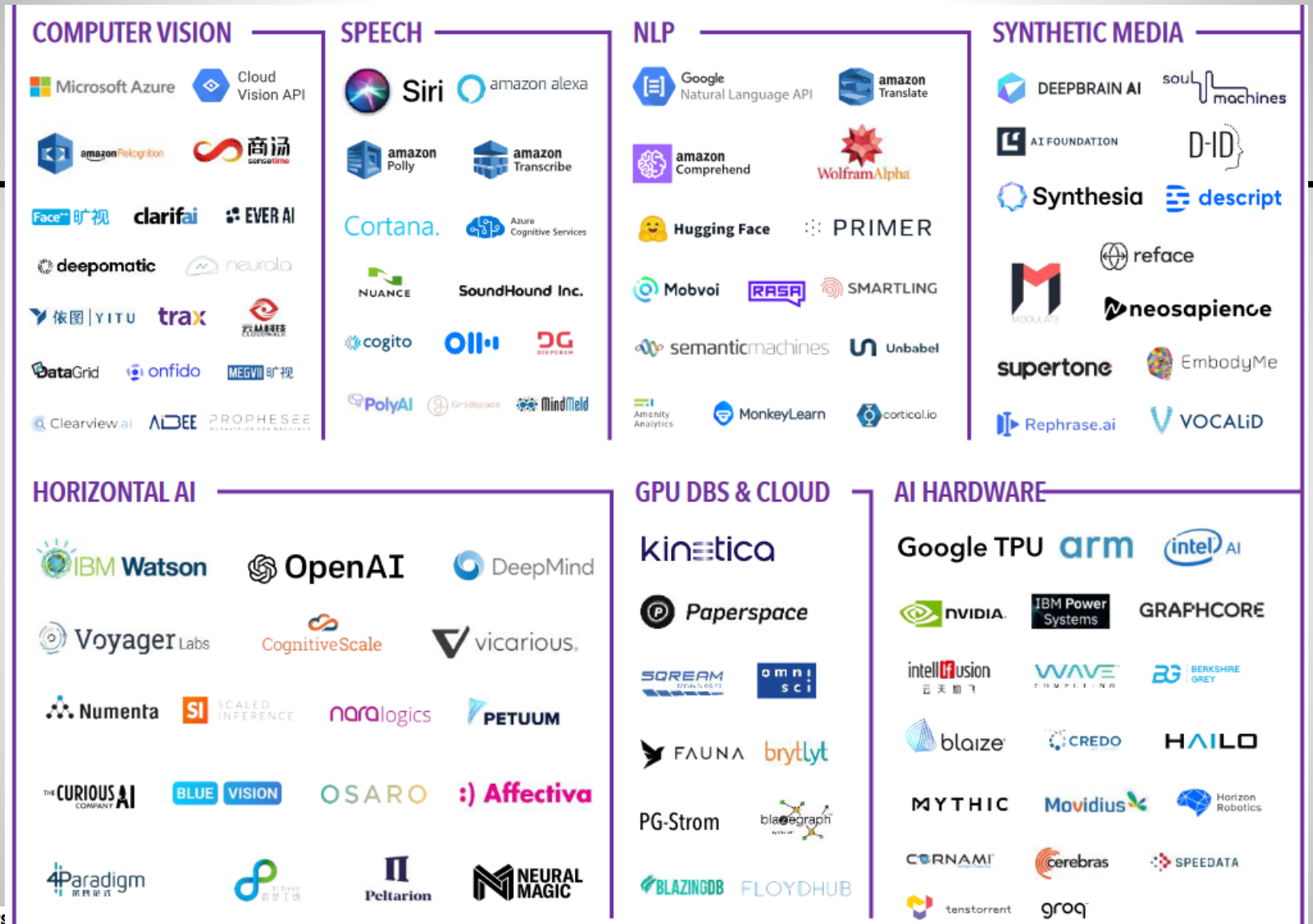


Analytics in Healthcare - Example

Data analytics - Defined

The simplest definition of data analytics is the science of identifying patterns in data and gaining insights from that data. Use data analytics to make evidence-based decisions that are transparent, verifiable, and robust. This involves using techniques, tools, and systems that help:

- Identify and clarify patterns in data
- Identify trends and changes
- Validate the next best action to achieve desired change

Source: Independence

Independence

- Ability to create models to predict future hospitalizations and readmissions, the onset of diabetes, and the likelihood of high-risk pregnancies — issues that affect communities of color at a higher rate — to make more informed decisions to help reduce racial health disparities and improve health outcomes.
- Advanced analytics have the potential for use in many different realms of health care. These range from clinical and operations research to clinical decision support, population health management, fraud prevention, and evaluating the effectiveness of specific programs.

Top use cases of analytics in healthcare for clinical, financial, and operational improvement:

1. Detecting fraud risk
2. Ensuring data security
3. Forecasting patient loads
4. Monitoring real-time data
5. Predicting disease outcomes
6. Predicting treatment plans
7. Predicting benefits of certain drugs
8. Prescription auditing
9. Tracking patient prescriptions and refills
10. Identify patient risk of substance abuse

Fraud Analytics - Healthcare

- Growth in patients, uninformed, complexity of billing and services, accessories
- COVID 19 – shutdowns, uncertainties, greed, false pretense of patient needs
- On-Demand services
- Healthcare fraud analytics market: insurance claims review, medical and pharmacy billing exploitation and misuse, payment honesty, and other applications

Common examples of fraud and abuse in healthcare

- Illegal medical billing practices in which claims are falsified.
- Multiple claims are filed by different providers for the same patient.
- Patient identities are stolen and used to gain reimbursement for medical services never provided.
- Collusion between unprincipled providers and their patients in which money from claims is shared.
- It is estimated that 3%-10% of annual healthcare costs in the U.S. can be attributed specifically to fraudulent billing.
- recent GAO report states that 68% of all medical fraud is the result of false billing and that healthcare providers are complicit in 62% of those cases, while patients are complicit in 14% of those.

https://www.romexsoft.com/blog/healthcare-fraud-detection/

Healthcare fraud auditing and detection system

- Identify inconsistencies and “rule-breaking” behaviors.
- Detect and prevent potentially improper payments, by flagging them for review.
- Continually mine data to identify new fraudulent patterns and develop new “rules” for those as well.

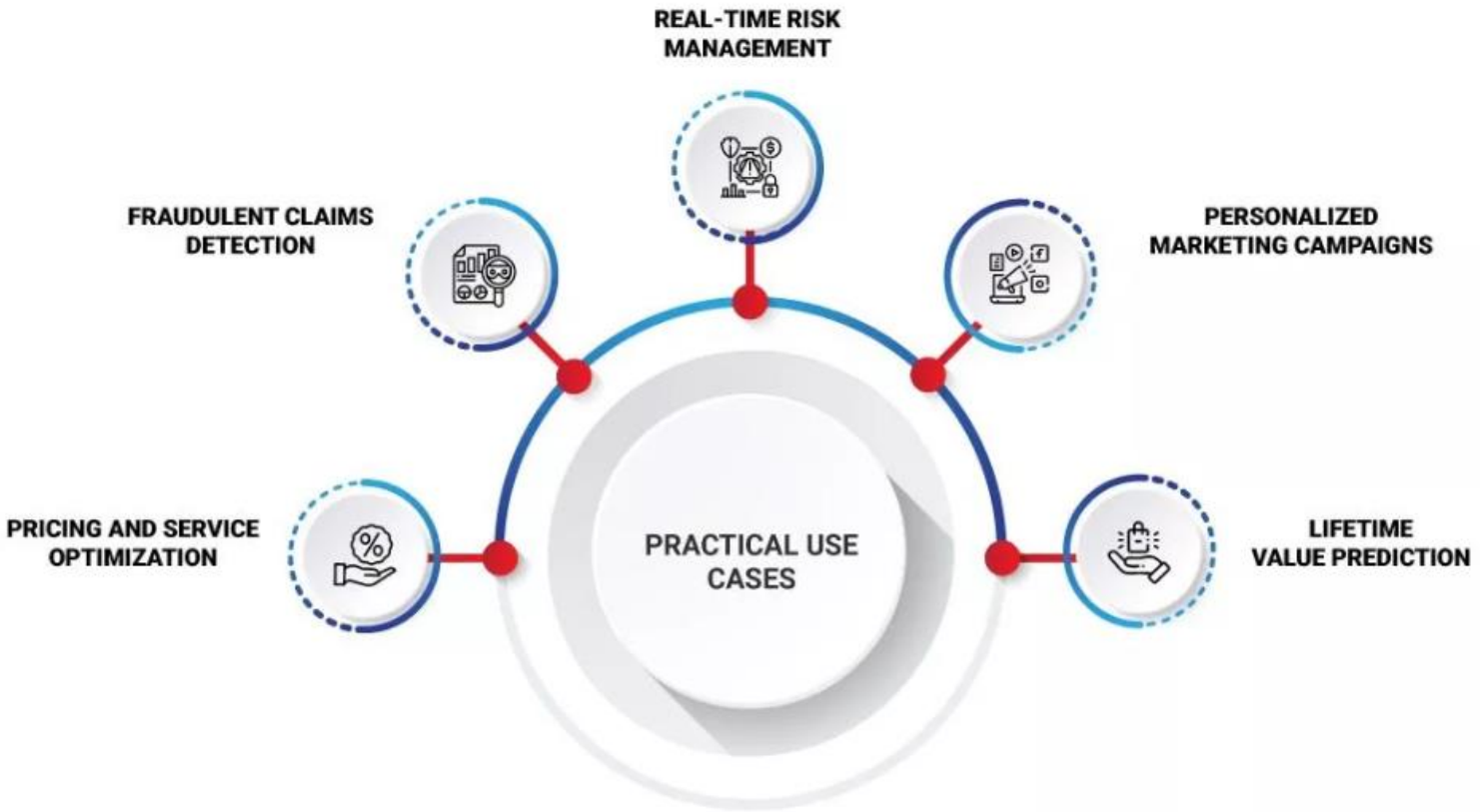
Analytic Approaches

- Predictive modeling
- Link analysis
- Duplicate and gap testing
- Entry date validation
- Risk scoring
- Spike analysis (consider COVID)
- Cluster analysis
- Trend analysis

Challenges – Integrating Analytics

- Diversity in data formats
- Data storage
- Data technologies and staff

Top Use Cases of Data Analytics in Insurance



Source: https://www.rishabhsoft.com/blog/data-analytics-in-insurance

TOPICS

- Campus News
- Arts & Design
- Business & Economy
- Education & Society
- Engineering & Technology
- Environment
- Law & Politics
- Science & Health
- All News

FOR THE MEDIA

- Find an Expert
- Public Records Requests
- Quick Facts

SCIENCE & HEALTH

Relationship Between Low Income and Obesity is Relatively New

DECEMBER 11, 2018

It's a fact: poverty and obesity are intimately connected.

But this relationship is only about 30 years old, according to a new study coauthored by UT researchers and published in *Palgrave Communications,* an open-access, online journal.

"We found that the relationship between low income and high rates of

Monthly Archives

Select Month

Popular Posts

Robot Food Delivery Service Officially Launches on Rocky Top
posted on March 8, 2022

Forbes Names UT One of America's Best Employers
posted on February 10, 2022

Students Headed to LA to Work Super Bowl
posted on February 10, 2022

Celebrating "Twosday" with Tennessee Traditions

U of TN (extract)

- Poverty and obesity are intimately connected.
- Relationship is only about 30 years old, new study coauthored by UT researchers and published in *Palgrave Communications*, an open-access, online journal.
- "We found that the relationship between low income and high rates of adult obesity in the U.S. is not observable until the early 1990s, as recently as 1990, this was not a detectable problem,"
- For the research, scientists analyzed obesity data collected by the Centers of Disease Control and the Robert Wood Johnson Foundation between 1990 and 2017 at state level, and 2004 and 2013 at county level. Researchers then compared these obesity rates with the median household income from the U.S. Census.
- The study shows that since 1990, the correlation between household income and the obesity rate has grown steadily, from virtually no correlation to a very strong correlation by 2016.

Division for Heart Disease and Stroke Prevention

Interactive Atlas Home
View Tables
Sample Maps
How to Use the Atlas
Data Sources
Statistical Methods

Related CDC Web Sites

Heart Disease
Stroke
High Blood Pressure
Salt
Cholesterol
Million Hearts®
WISEWOMAN

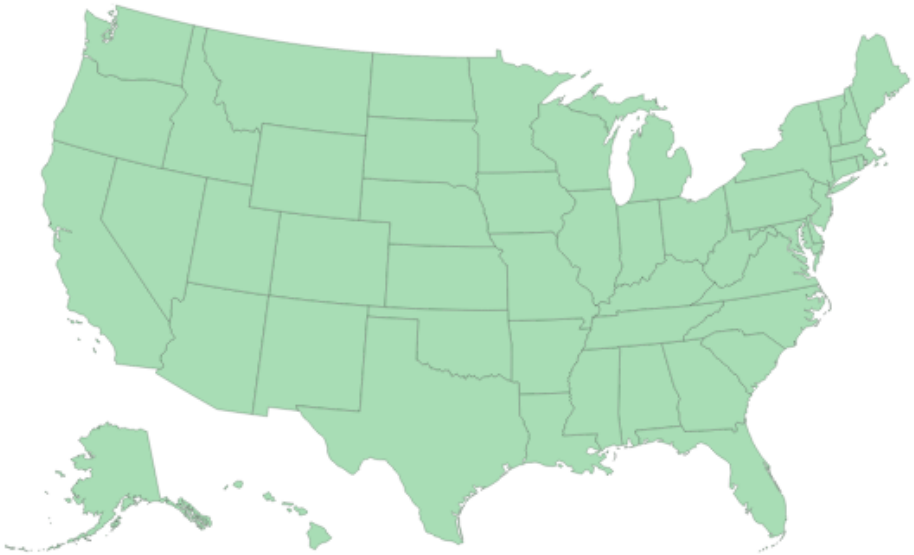
Interactive Atlas of Heart Disease and Stroke

CDC's Interactive Atlas of Heart Disease and Stroke is an online mapping tool that allows users to create and customize county-level maps of heart disease and stroke by race and ethnicity, gender, age group, and more.

Launch the Interactive Atlas

Select one of the buttons below to view a map of the complete US, or select a state/territory in the map or from the dropdown below.

US Map - County Level US Map - State Level

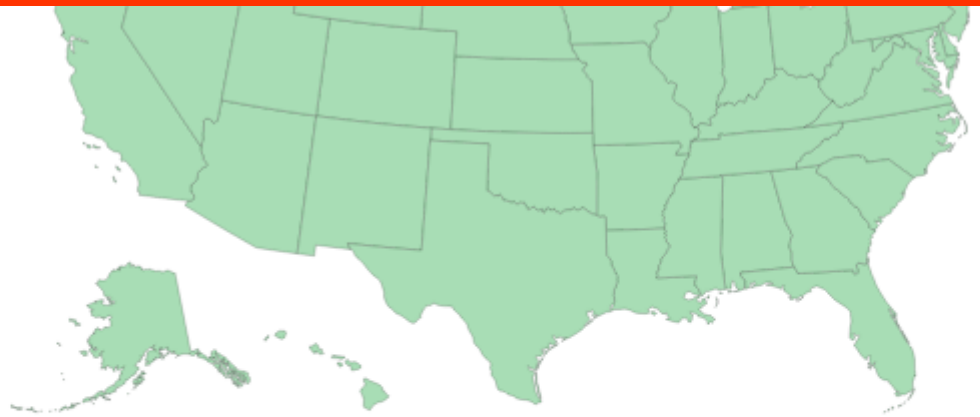


Territories AS GU PR VI MP

Select an Item

Alabama Go

- Stroke
- High Blood Pressure
- Salt
- Cholesterol
- Million Hearts®
- WISEWOMAN



Territories AS GU PR VI MP

Select an Item

Alabama Go

View Tables by Geographic Area or Report Data

Sample Maps

How to Use the Atlas

Other Map Resources

Data Sources

Download the Data

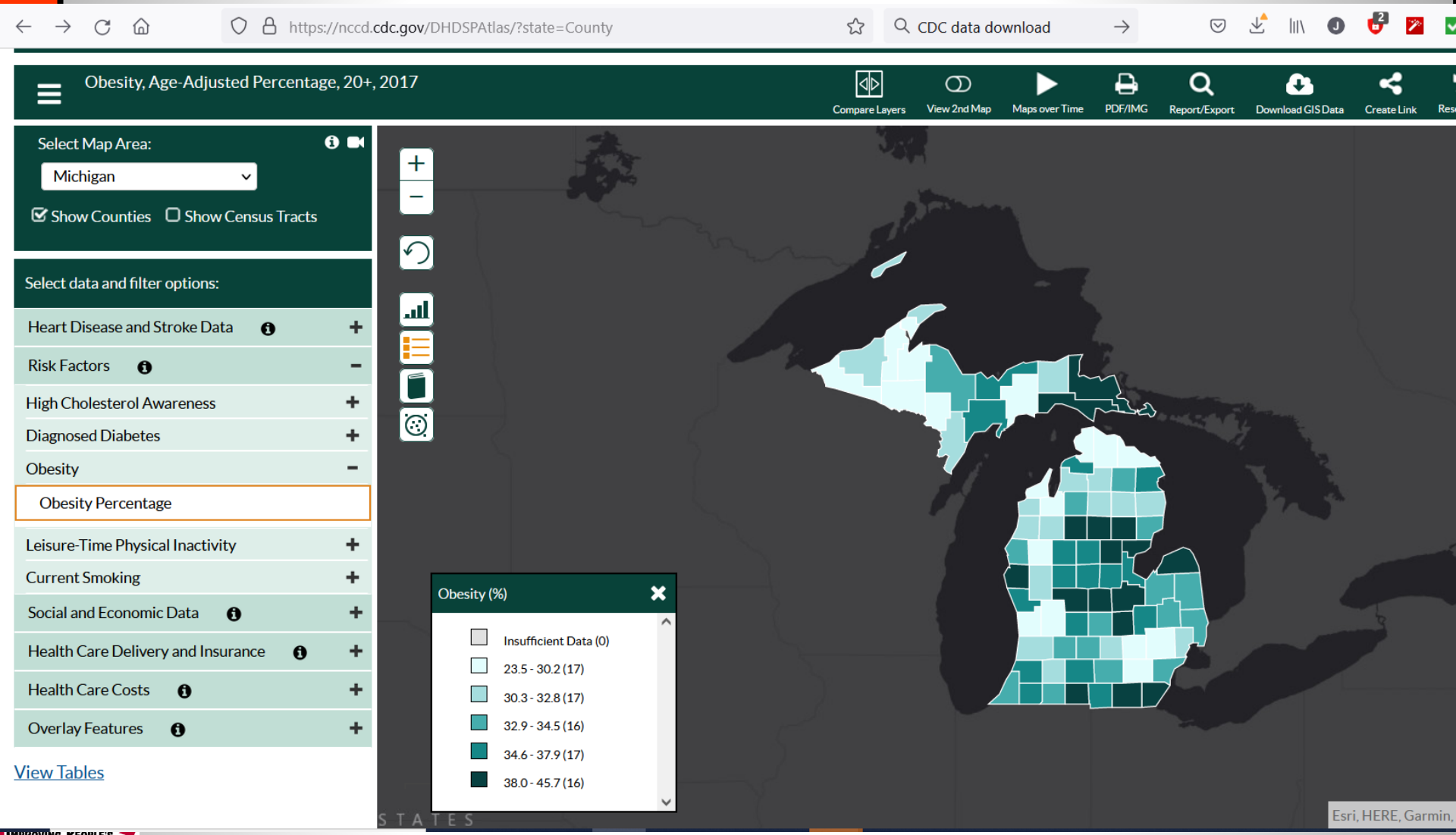
Statistical Methods

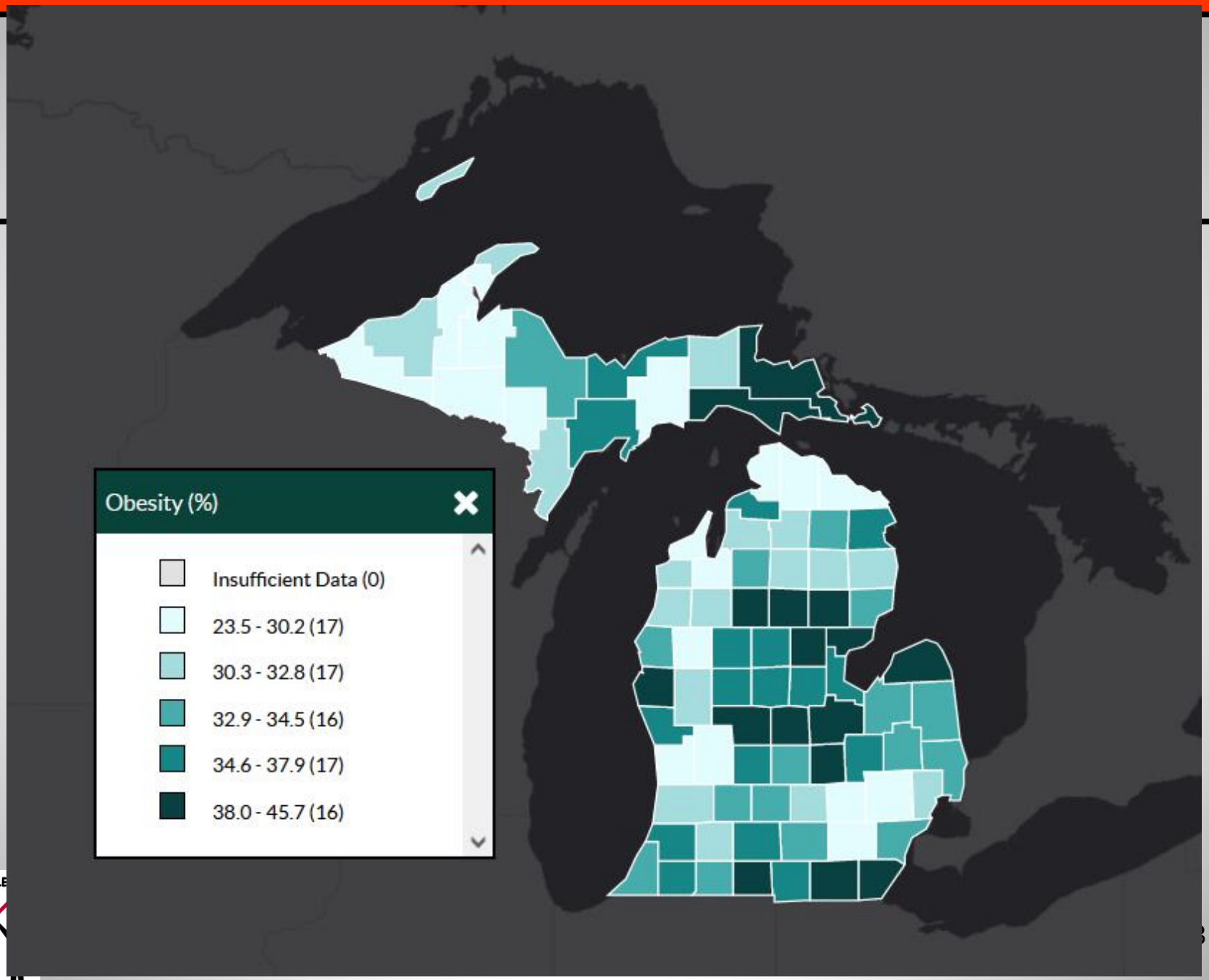
Citation

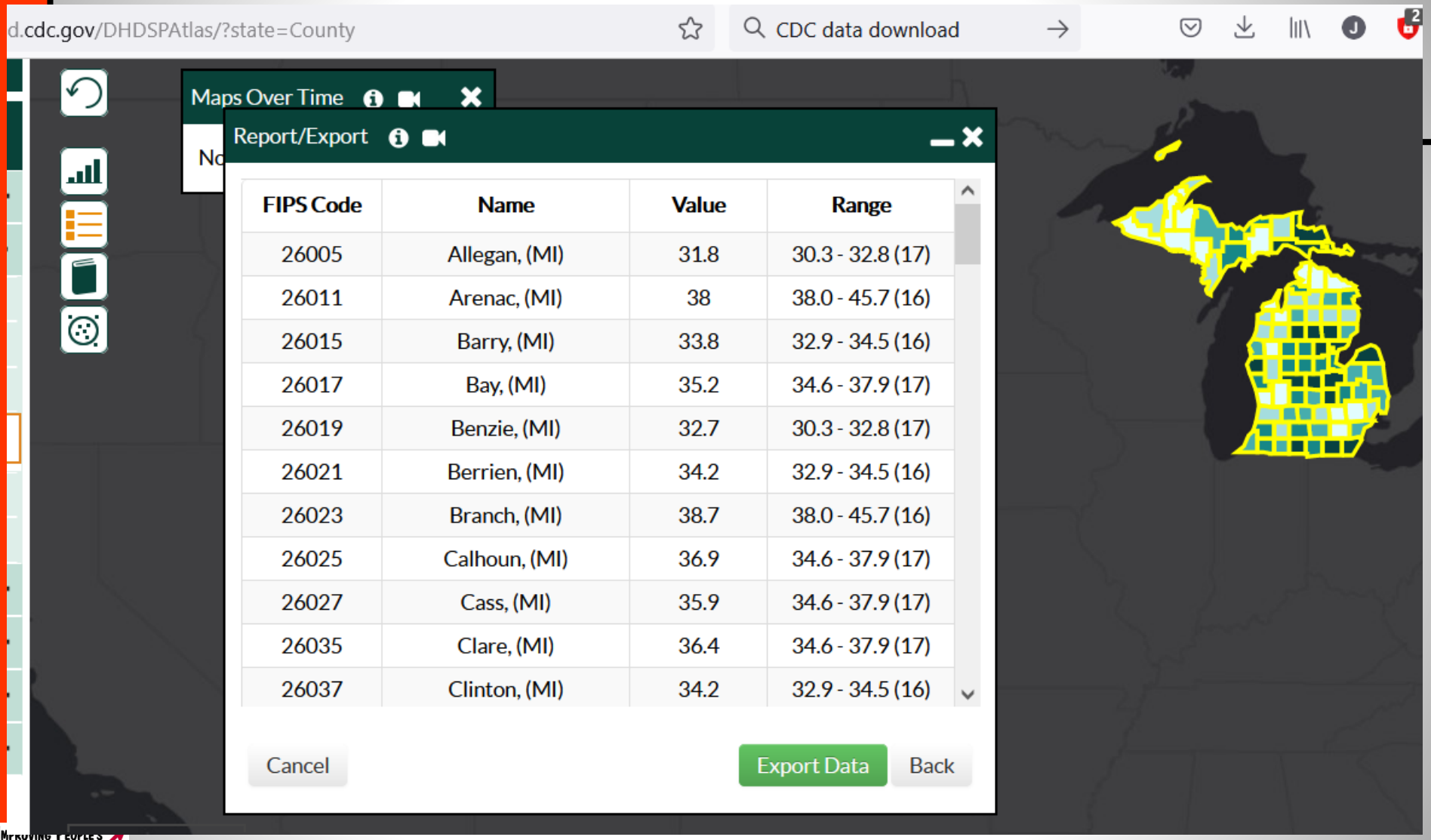
Recommended Citation: Centers for Disease Control and Prevention. Interactive Atlas of Heart Disease and Stroke. http://nccd.cdc.gov/DHDSPAtlas. Accessed on [insert date].

Page last reviewed: March 13, 2020

Content source: National Center for Chronic Disease Prevention and Health Promotion , Division for Heart Disease and Stroke Prevention


https://nccd.cdc.gov/DHDSPAtlas/?state=County
CDC data download
Obesity, Age-Adjusted Percentage, 20+, 2017
Compare Layers
View 2nd Map
Maps over Time
PDF/IMG
Report/Export
Download GIS Data
Create Link
Select Map Area:
Michigan
Show Counties
Show Census Tracts
Select data and filter options:
Heart Disease and Stroke Data
Risk Factors
High Cholesterol Awareness
Diagnosed Diabetes
Obesity
Obesity Percentage
Leisure-Time Physical Inactivity
Current Smoking
Social and Economic Data
Health Care Delivery and Insurance
Health Care Costs
Overlay Features
View Tables
Obesity (%)
Insufficient Data (0)
23.5 - 30.2 (17)
30.3 - 32.8 (17)
32.9 - 34.5 (16)
34.6 - 37.9 (17)
38.0 - 45.7 (16)
Esri, HERE, Garmin,





report.csv - Notepad

File Edit Format View Help

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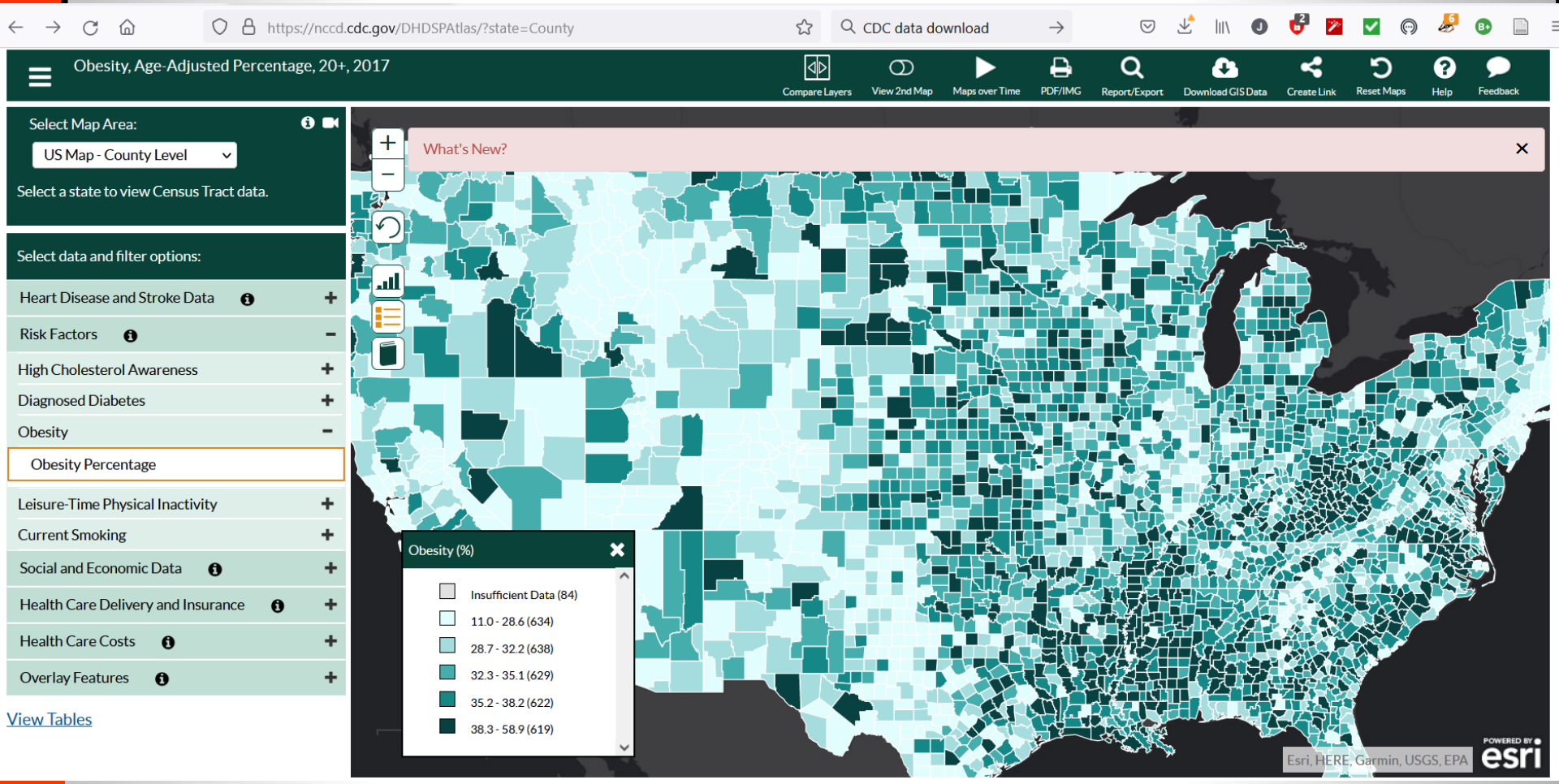
Improving People's Lives and Their Businesses


https://nccd.cdc.gov/DHDSPAtlas/?state=County
CDC data download
Obesity, Age-Adjusted Percentage, 20+, 2017
Compare Layers
View 2nd Map
Maps over Time
PDF/IMG
Report/Export
Download GIS Data
Create Link
Reset Maps
Help
Feedback
Select Map Area:
US Map - County Level
Select a state to view Census Tract data.
Select data and filter options:
Heart Disease and Stroke Data
Risk Factors
High Cholesterol Awareness
Diagnosed Diabetes
Obesity
Obesity Percentage
Leisure-Time Physical Inactivity
Current Smoking
Social and Economic Data
Health Care Delivery and Insurance
Health Care Costs
Overlay Features
View Tables
What's New?
Obesity (%)
Insufficient Data (84)
11.0 - 28.6 (634)
28.7 - 32.2 (638)
32.3 - 35.1 (629)
35.2 - 38.2 (622)
38.3 - 58.9 (619)
Esri, HERE, Garmin, USGS, EPA
POWERED BY esri

Powering Better Health Care: Da × Interactive Atlas of Heart Diseas ×

https://nccd.cdc.gov/DHDSPAtlas/Reports.aspx

CDC data download

Filters:

Year: 2017-2019

Race/Ethnicity: All Races/Ethnicities

Gender: Both Genders

Age: 35+

Spatial Smoothing: Smoothed

Show Results

Summary Statistics | **County Statistics**

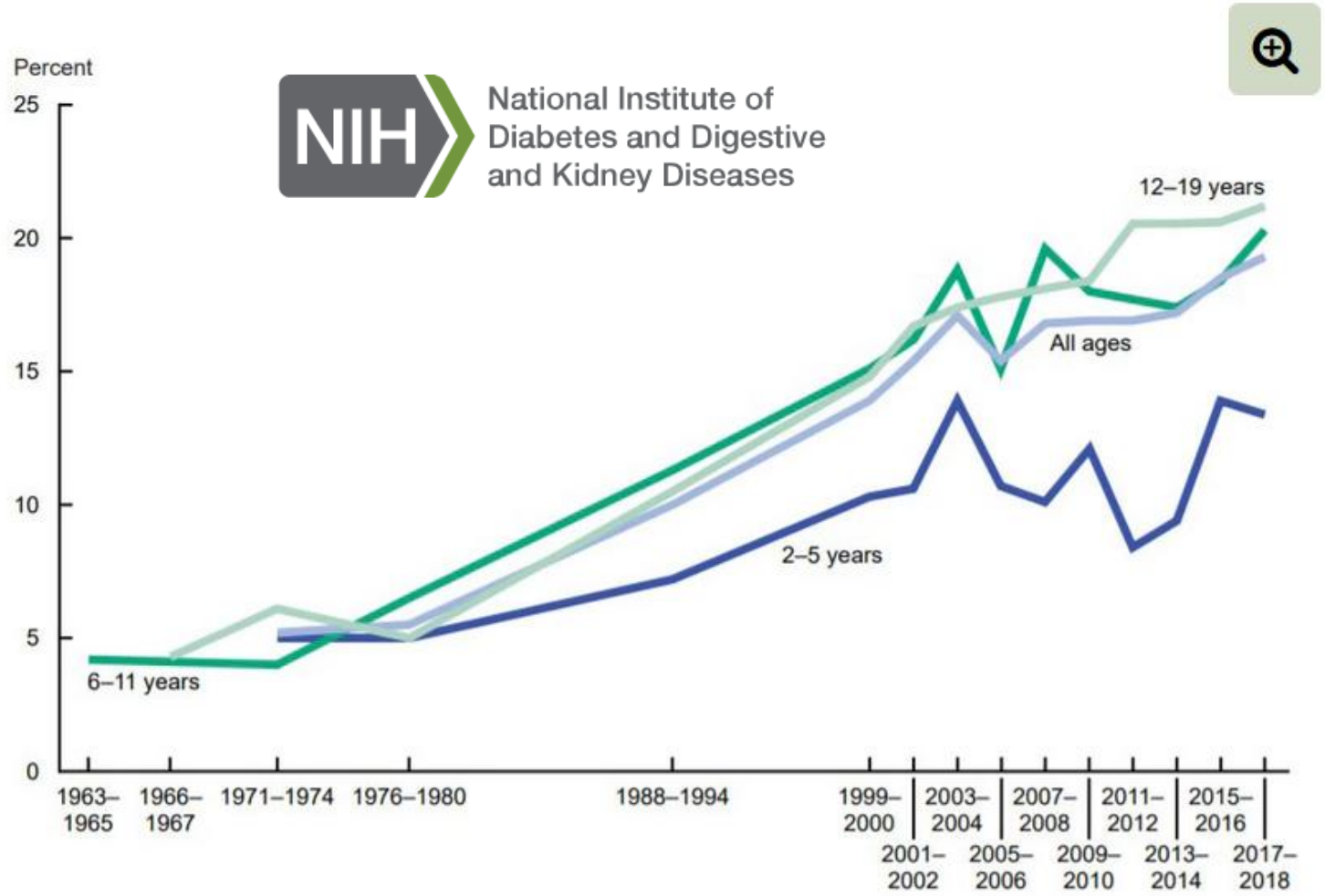
National Statistics

Total Cardiovascular Disease Death Rate per 100,000, 35+, All Races/Ethnicities, Both Genders, 2017-2019

Race or Ethnicity	National Value
All Races/Ethnicities	419.2
Black (Non-Hispanic)	553.6
White (Non-Hispanic)	424.4
Hispanic	307.1
American Indian and Alaskan Native	370
Asian and Pacific Islander	248.1

Youth

Trends in obesity among children and adolescents ages 2–19 years, by age: United States, 1963–1965 through 2017–2018[3]



NOTE: Obesity is defined as body mass index (BMI) at or above the 95th percentile from the sex-specific BMI-for-age 2000 CDC Growth Charts.

- https://www.slate.com/content/dam/slate/articles/news_and_politics/map_of_the_week/2013/04/130417-MOTW-obesity-map.gif

File Edit View History Bookmarks Tools Help

Powering Better Health Care: | Interactive Atlas of Heart Dise | How to Download the Data | GIS.XL | How to Import Shape | SHP to XLSX Converter Online | DNPAO Data, Trends and Map | 5 Meth

https://nccd.cdc.gov/dnpao_dtm/rdPage.aspx?rdReport=DNPAO_DTM.ExploreByTo

obesity by year scroll

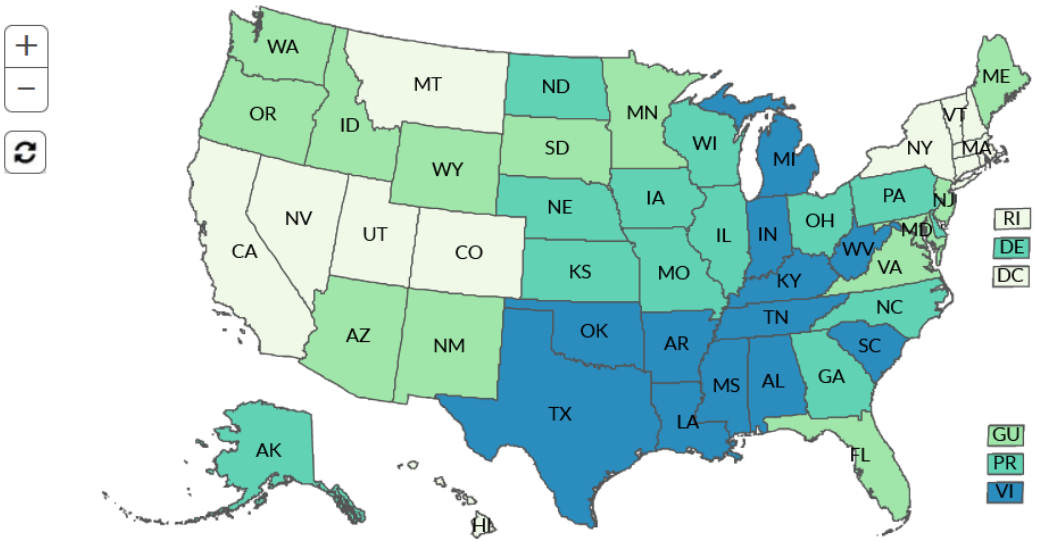
View by Total

Year 2016

2016

Percent of adults aged 18 years and older who have obesity †

View by: Total



Value

- 22.3 - 27.1
- 27.2 - 29.9
- 30.0 - 32.0
- 32.1 - 37.7
- Data unavailable

Quantile

Legend Settings

† Obesity is defined as body mass index (BMI) ≥ 30.0; BMI was calculated from self-reported weight and height (weight [kg]/ height [m²]).Respondents reporting weight < 50 pounds or ≥ 650 pounds; height < 3 feet or ≥ 8 feet; or BMI: <12 or ≥ 100 were excluded.Pregnant respondents were also excluded.

Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

Data Source

File Edit View History Bookmarks Tools Help

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https://nccd.cdc.gov/dnpao_dtm/rdPage.aspx?rdReport=DNPAO_DTM.ExploreByTo

obesity by year scroll

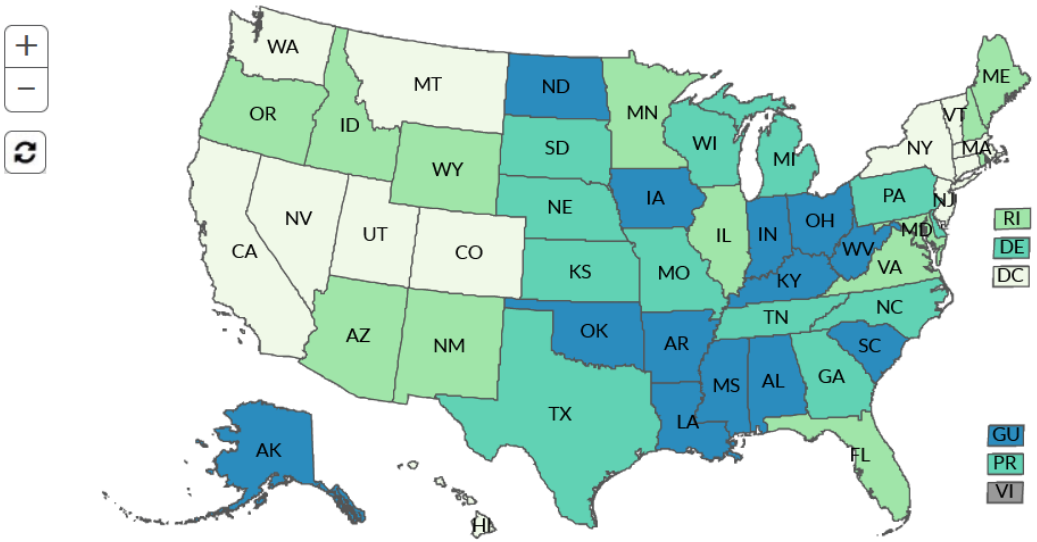
View by Total

Year 2017

2017

Percent of adults aged 18 years and older who have obesity †

View by: Total



Value

- 22.6 - 27.7
- 27.8 - 31.3
- 31.4 - 33.0
- 33.1 - 38.1
- Data unavailable

Quantile

Legend Settings

† Obesity is defined as body mass index (BMI) ≥ 30.0; BMI was calculated from self-reported weight and height (weight [kg]/ height [m²]).Respondents reporting weight < 50 pounds or ≥ 650 pounds; height < 3 feet or ≥ 8 feet; or BMI: <12 or ≥ 100 were excluded.Pregnant respondents were also excluded.

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https://nccd.cdc.gov/dnpao_dtm/rdPage.aspx?rdReport=DNPAO_DTM.ExploreByTo

obesity by year scroll

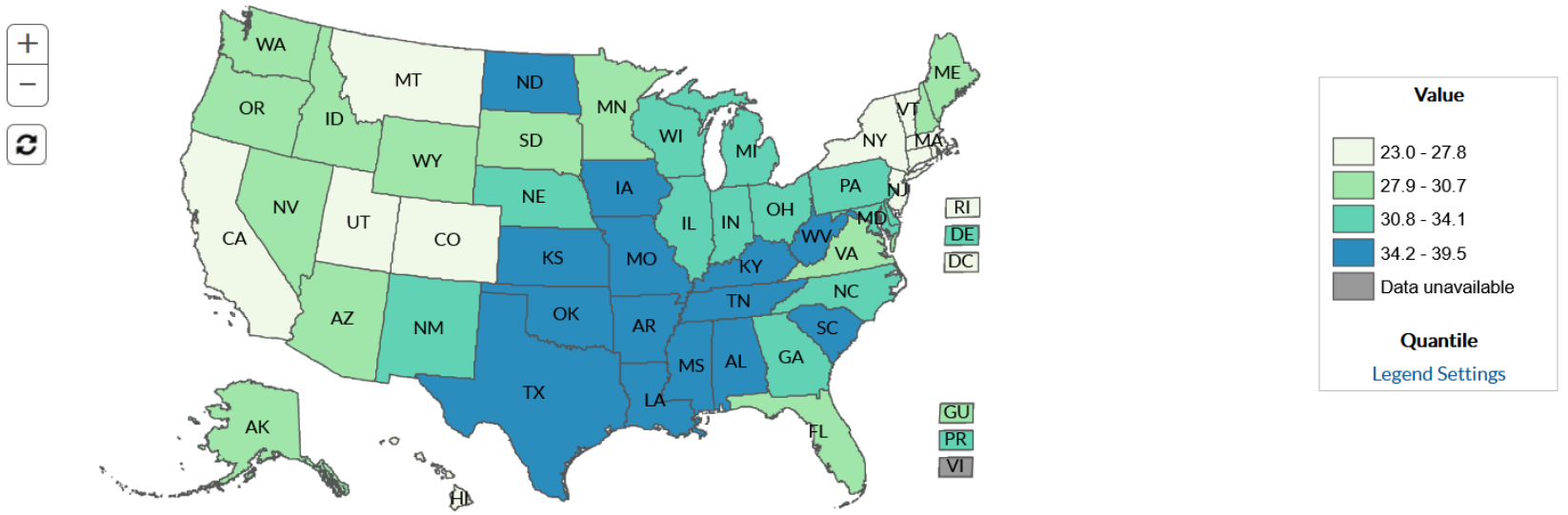
View by Total

Year 2018

2018

Percent of adults aged 18 years and older who have obesity †

View by: Total



† Obesity is defined as body mass index (BMI) ≥ 30.0; BMI was calculated from self-reported weight and height (weight [kg]/ height [m²]).Respondents reporting weight < 50 pounds or ≥ 650 pounds; height < 3 feet or ≥ 8 feet; or BMI: <12 or ≥ 100 were excluded.Pregnant respondents were also excluded.

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https://nccd.cdc.gov/dnpao_dtm/rdPage.aspx?rdReport=DNPAO_DTM.ExploreByTo

obesity by year scroll

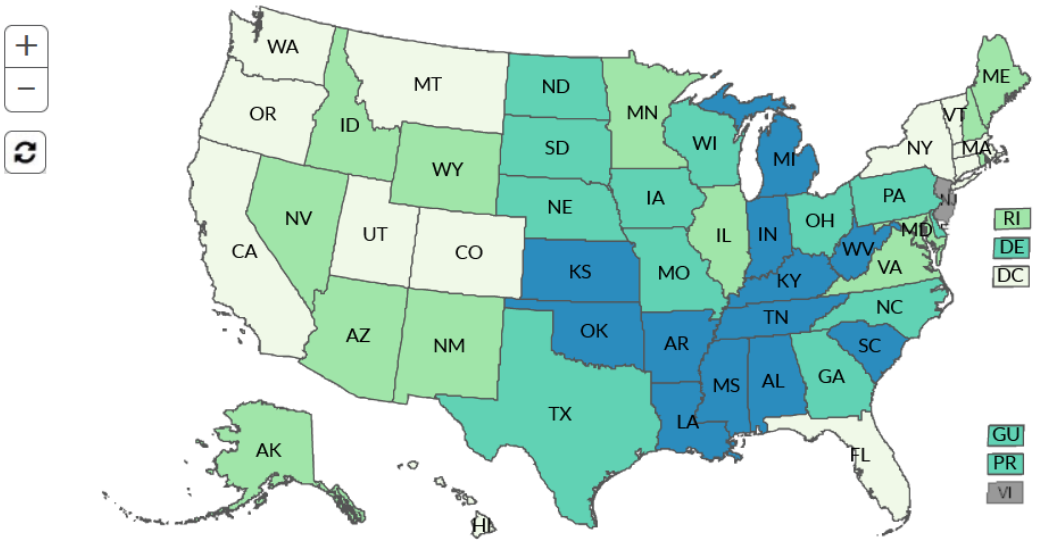
View by Total

Year 2019

2019

Percent of adults aged 18 years and older who have obesity †

View by: Total



Value

- 23.8 - 29.2
- 29.3 - 32.3
- 32.4 - 34.8
- 34.9 - 40.8
- Data unavailable

Quantile

Legend Settings

† Obesity is defined as body mass index (BMI) ≥ 30.0; BMI was calculated from self-reported weight and height (weight [kg]/ height [m²]).Respondents reporting weight < 50 pounds or ≥ 650 pounds; height < 3 feet or ≥ 8 feet; or BMI: <12 or ≥ 100 were excluded.Pregnant respondents were also excluded.

Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

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https://nccd.cdc.gov/dnpao_dtm/rdPage.aspx?rdReport=DNPAO_DTM.ExploreByTo

obesity by year scroll

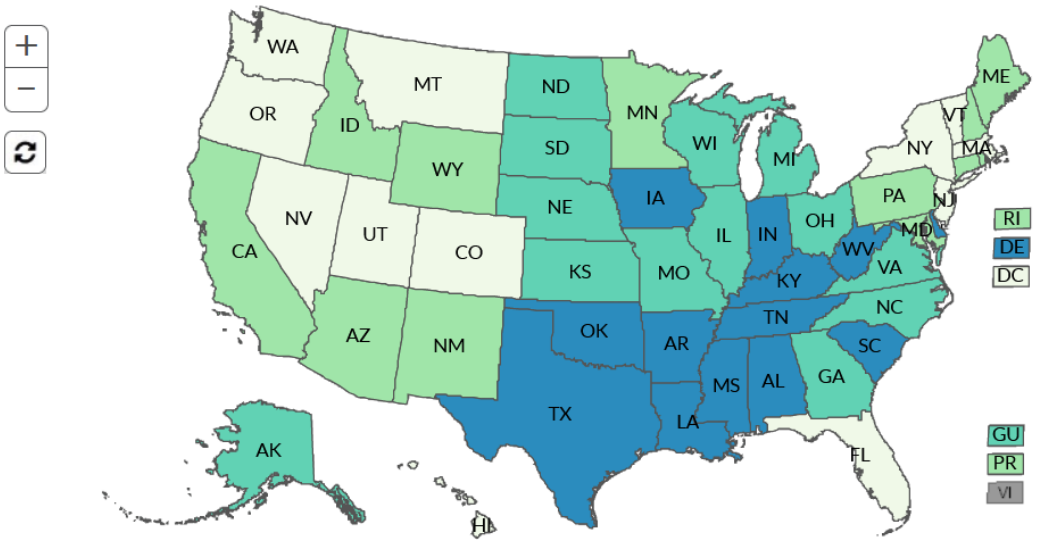
View by Total

Year 2020

2020

Percent of adults aged 18 years and older who have obesity †

View by: Total



Value

- 24.2 - 28.7
- 28.8 - 31.5
- 31.6 - 35.5
- 35.6 - 39.7
- Data unavailable

Quantile

Legend Settings

† Obesity is defined as body mass index (BMI) ≥ 30.0; BMI was calculated from self-reported weight and height (weight [kg]/ height [m²]).Respondents reporting weight < 50 pounds or ≥ 650 pounds; height < 3 feet or ≥ 8 feet; or BMI: <12 or ≥ 100 were excluded.Pregnant respondents were also excluded.

Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

Data Source

Search Results

Displaying 31 series for **michigan income saginaw.**

Refine your search:

Concepts

- Poverty (21)
- Child (20)
- Persons (12)
- Income (9)
- Percent (9)
- 5 to 17 Years (6)
- Family (6)
- Under 18 Years (6)
- Personal (5)
- Personal Income (5)

Geography Types

Geographies

Sort by Relevance

Estimate of Median Household Income for Saginaw County, MI
Dollars, Annual, Not Seasonally Adjusted — 1989 to 2020 (Dec 16)

The U.S. Census Bureau provides annual estimates of income and poverty statistics for all school districts, counties, and states through the Small Area Income and Poverty Estimates (https://www.census.gov/programs-surveys/saipe...

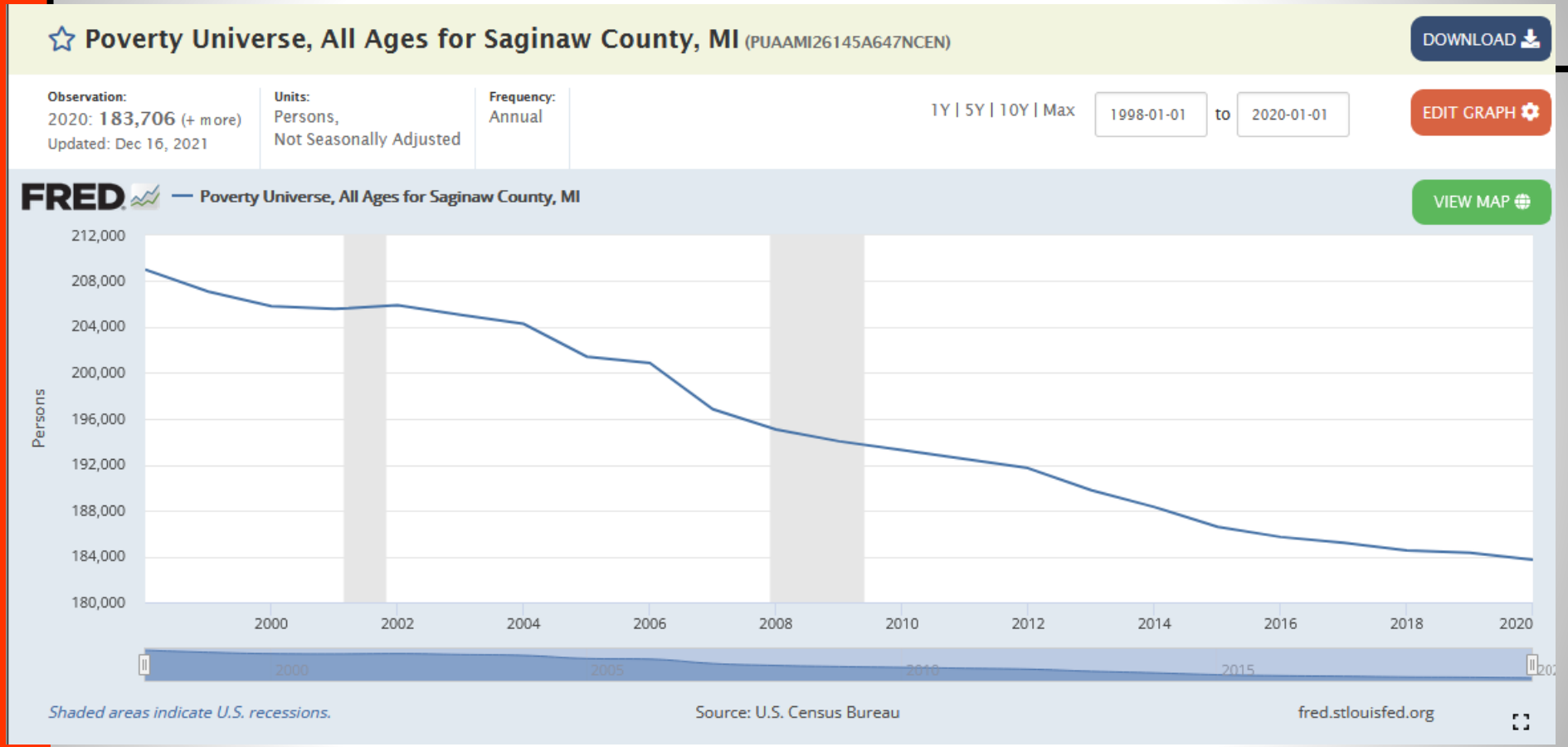
Real Personal Income for Saginaw, MI (MSA)
Thousands of Chained 2012 Dollars, Annual, Not Seasonally Adjusted — 2008 to 2020 (Dec 14)

Real personal income is personal income at RPPs divided by the national PCE price index. It is estimated for states, state metro/nonmetro portions, metropolitan statistical areas, and the combined nonmetropolitan portion of the United...

Per Capita Personal Income in Saginaw, MI (MSA)
Dollars, Annual, Not Seasonally Adjusted — 1969 to 2020 (Nov 16)

Real Per Capita Personal Income for Saginaw, MI (MSA)
Chained 2012 Dollars, Annual, Not Seasonally Adjusted — 2008 to 2020 (Dec 14)

Real per capita personal income is the real personal income divided by midyear population. Real personal income is personal income at RPPs divided by the national PCE price index. It is estimated for states, state metro/nonmetro...


Poverty Universe, All Ages for Saginaw County, MI (PUAAMI26145A647NCEN)
DOWNLOAD
Observation:
2020: 183,706 (+ more)
Updated: Dec 16, 2021
Units:
Persons,
Not Seasonally Adjusted
Frequency:
Annual
1Y | 5Y | 10Y | Max
1998-01-01
to
2020-01-01
EDIT GRAPH
FRED
Poverty Universe, All Ages for Saginaw County, MI
VIEW MAP
212,000
208,000
204,000
200,000
196,000
192,000
188,000
184,000
180,000
Persons
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
Shaded areas indicate U.S. recessions.
Source: U.S. Census Bureau
fred.stlouisfed.org

Overdose Death Rates Involving Opioids, by Type, United States, 1999–2019

(Deaths per 100,000 people)

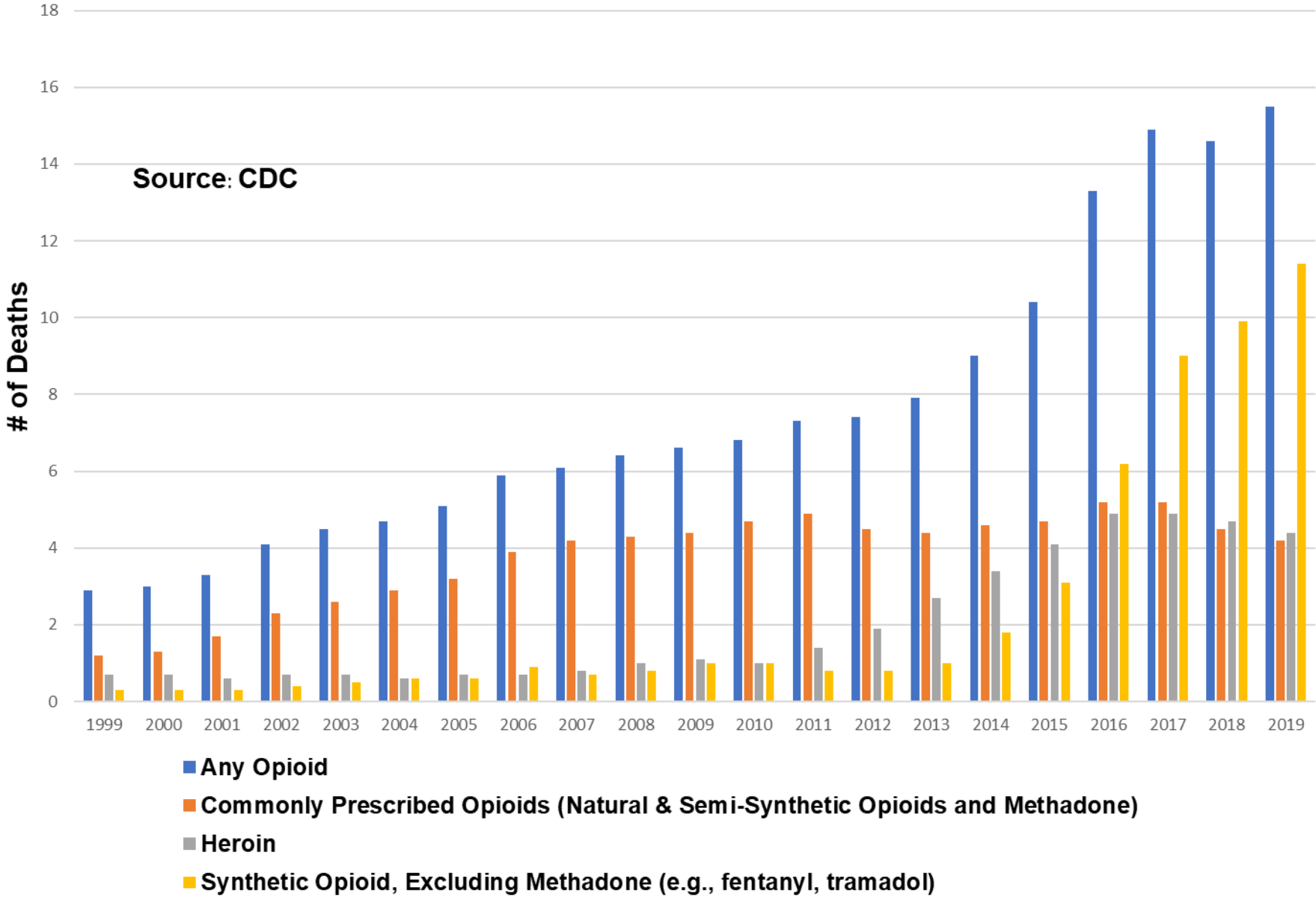
Year	Any Opioid	Commonly Prescribed Opioids (Natural & Semi-Synthetic Opioids and Methadone)	Heroin	Synthetic Opioid, Excluding Methadone (e.g., fentanyl, tramadol)
1999	2.9	1.2	0.7	0.3
2000	3	1.3	0.7	0.3
2001	3.3	1.7	0.6	0.3
2002	4.1	2.3	0.7	0.4
2003	4.5	2.6	0.7	0.5
2004	4.7	2.9	0.6	0.6
2005	5.1	3.2	0.7	0.6
2006	5.9	3.9	0.7	0.9
2007	6.1	4.2	0.8	0.7
2008	6.4	4.3	1	0.8
2009	6.6	4.4	1.1	1
2010	6.8	4.7	1	1
2011	7.3	4.9	1.4	0.8
2012	7.4	4.5	1.9	0.8
2013	7.9	4.4	2.7	1
2014	9	4.6	3.4	1.8
2015	10.4	4.7	4.1	3.1
2016	13.3	5.2	4.9	6.2
2017	14.9	5.2	4.9	9
2018	14.6	4.5	4.7	9.9
2019	15.5	4.2	4.4	11.4

***Note**: Deaths are classified using the International Classification of Diseases, Tenth Revision (ICD-10). Drug overdose deaths are identified using underlying cause of death codes X40-X44, X60-X64, X85, and Y10-Y14. The following multiple cause of death codes were used to identify specific drug types: T40.2 for natural and semi-synthetic opioid analgesics, T40.3 for methadone, T40.4 for synthetic opioid analgesics excluding methadone, T40.1 for heroin, and T40.0, T40.1, T40.2, T40.3, T40.4 or T40.6 for any opioid, and T40.2, T40.3 for prescription opioids. Approximately one-fifth of drug poisoning deaths lack information on the specific drugs involved. Some of these deaths may involve opioid analgesics or heroin. Age-adjusted death rates were calculated using the direct method and the 2000 standard population.*

***Source**: CDC/NCHS, National Vital Statistics System, Mortality.*

IMPROVING PEOPLE'S LIVES AND THEIR BUSINESSES

Deaths per 100,000 people - 1919-2019

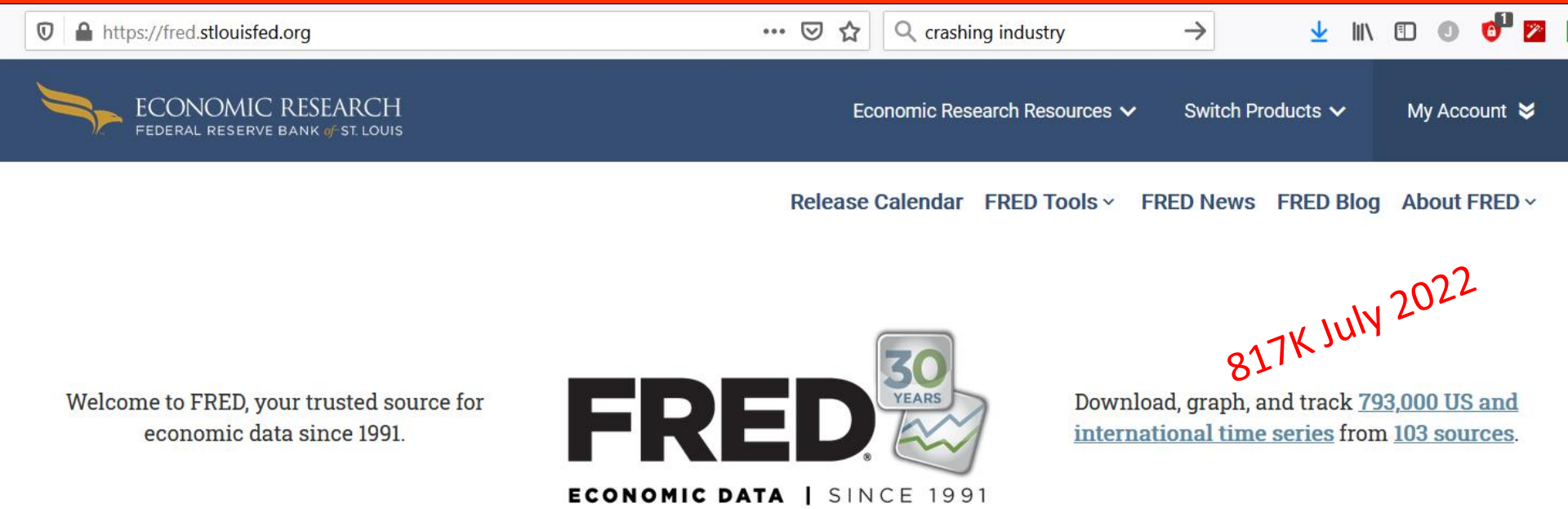


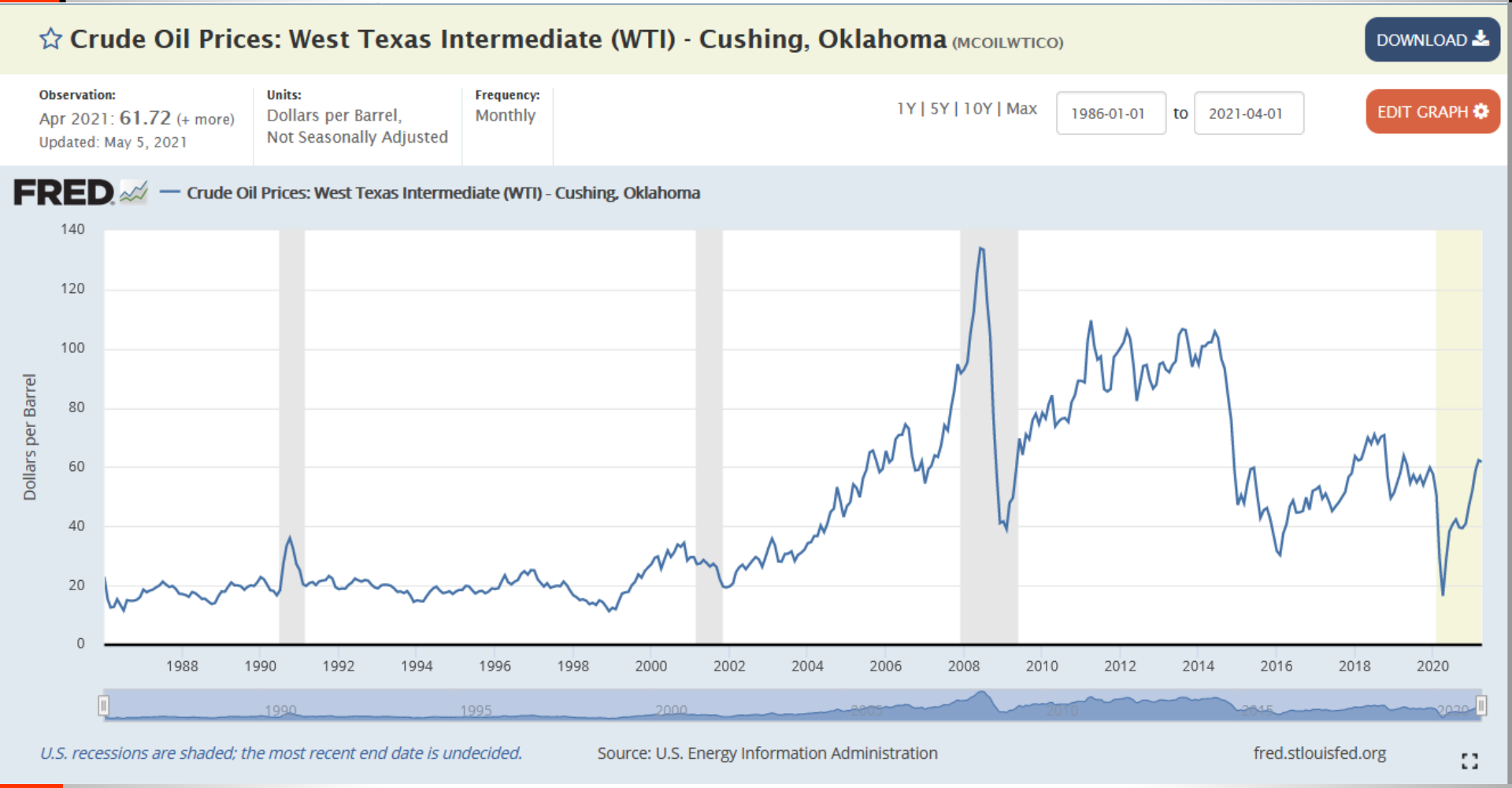
Resources for Data Discovery

- CDC
- NIH
- FRED
- SEC
- Data.GOV
- SimFin

Tools & Resources

- Federal Data
- Sparklines
- Excel add-in FRED
- Power BI Desktop




☆ Crude Oil Prices: West Texas Intermediate (WTI) - Cushing, Oklahoma (MCOILWTICO)
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Observation:
Apr 2021: 61.72 (+ more)
Updated: May 5, 2021
Units:
Dollars per Barrel,
Not Seasonally Adjusted
Frequency:
Monthly
1Y | 5Y | 10Y | Max
1986-01-01
to
2021-04-01
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Crude Oil Prices: West Texas Intermediate (WTI) - Cushing, Oklahoma
Dollars per Barrel
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U.S. recessions are shaded; the most recent end date is undecided.
Source: U.S. Energy Information Administration
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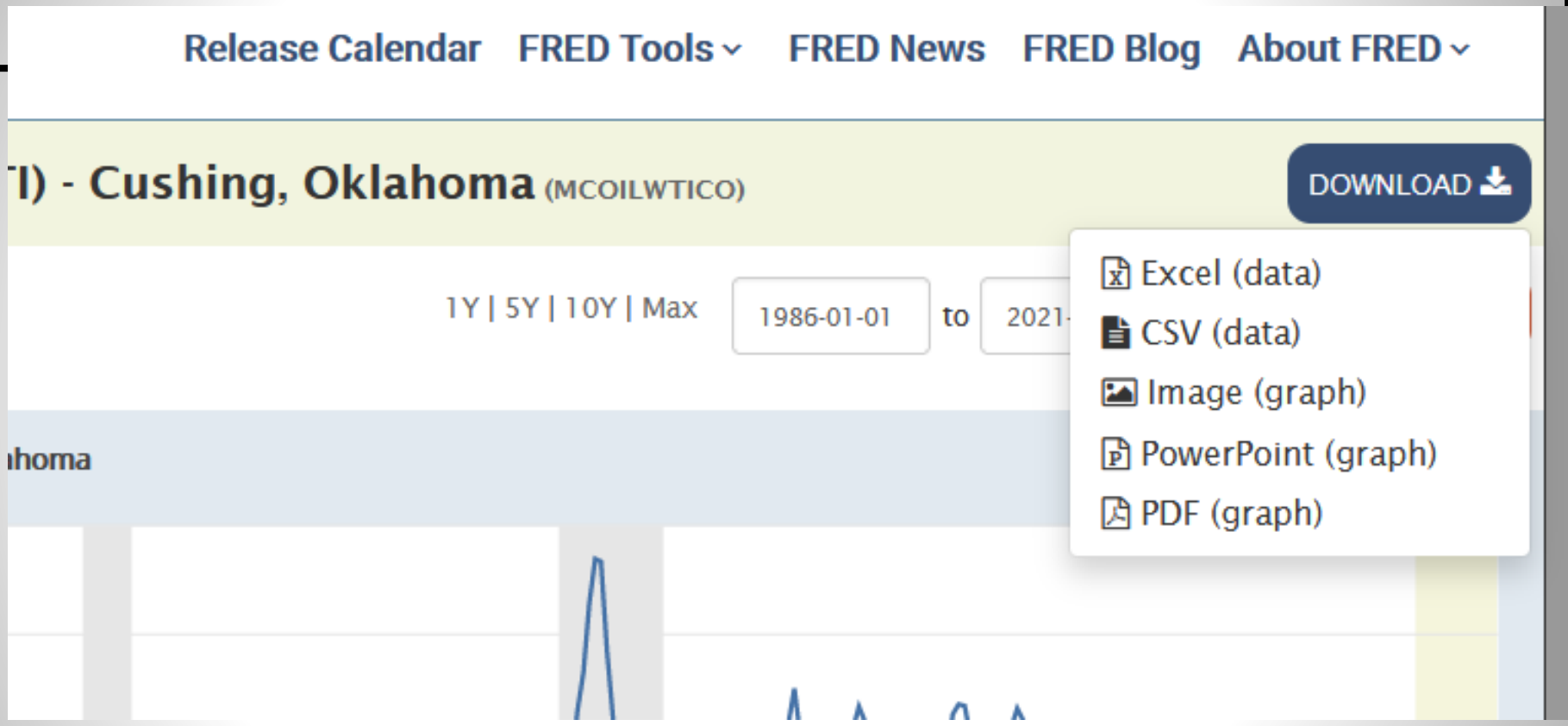

Categories > Production & Business Activity > Transportation > Motor Vehicles

☆ Auto Inventory/Sales Ratio (AISRSA)

DOWNLOAD

Observation: Mar 2021: 1.363 (+ more)
Updated: Apr 30, 2021

Units: Ratio, Seasonally Adjusted

Frequency: Monthly

1Y | 5Y | 10Y | Max 1993-01-01 to 2021-03-01

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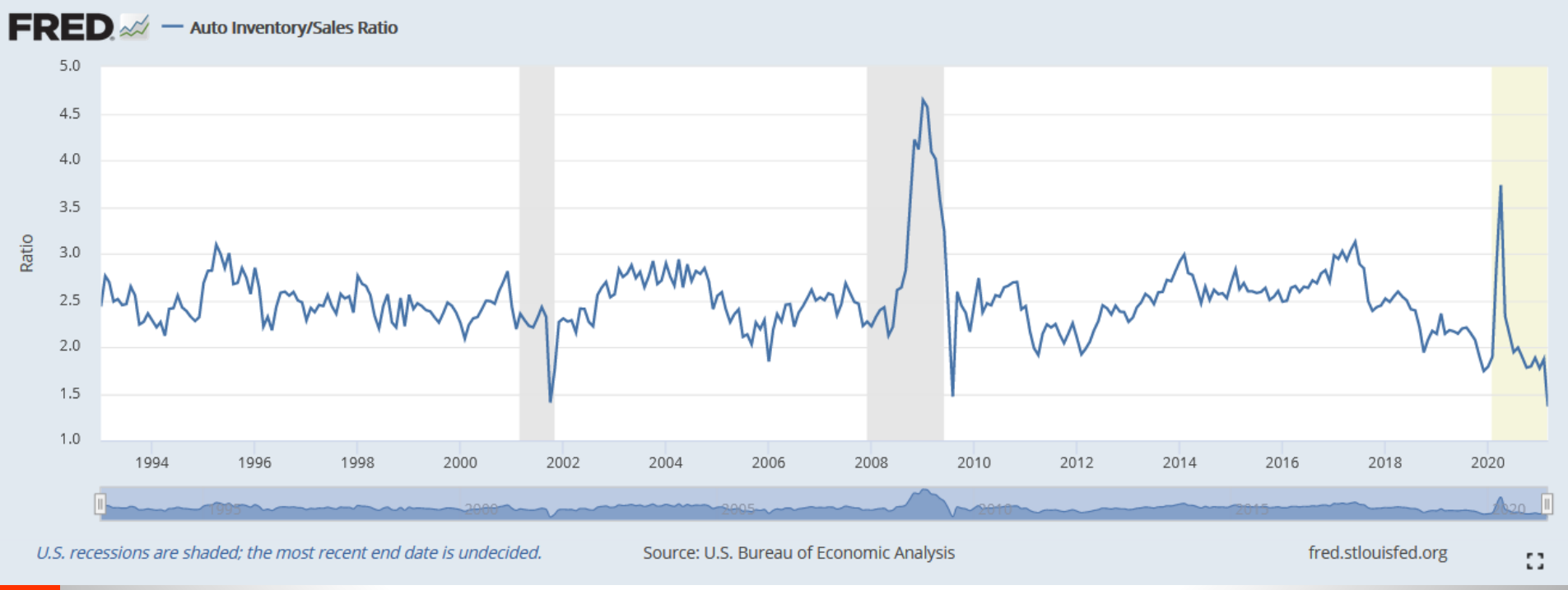

U.S. recessions are shaded; the most recent end date is undecided.

Source: U.S. Bureau of Economic Analysis

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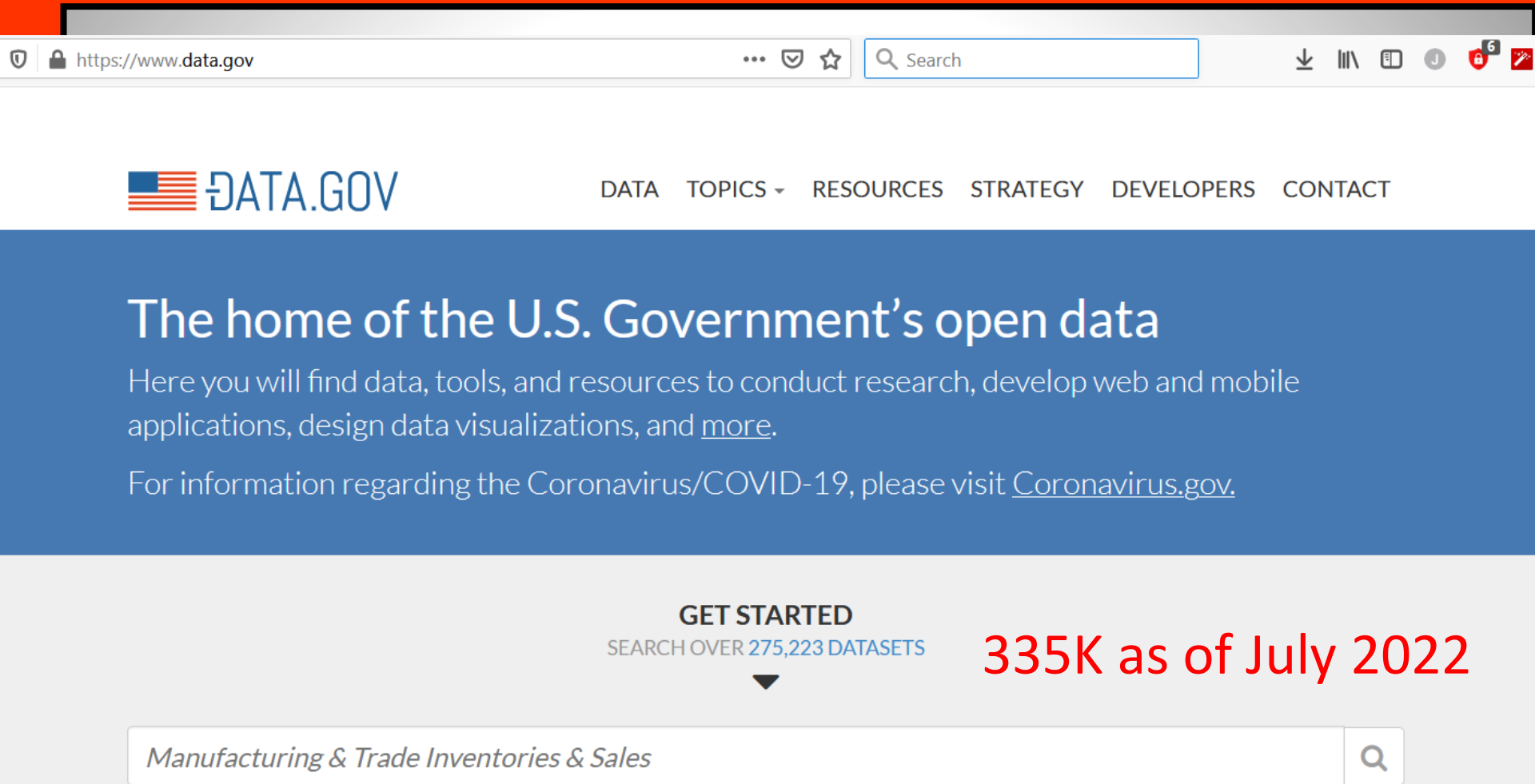

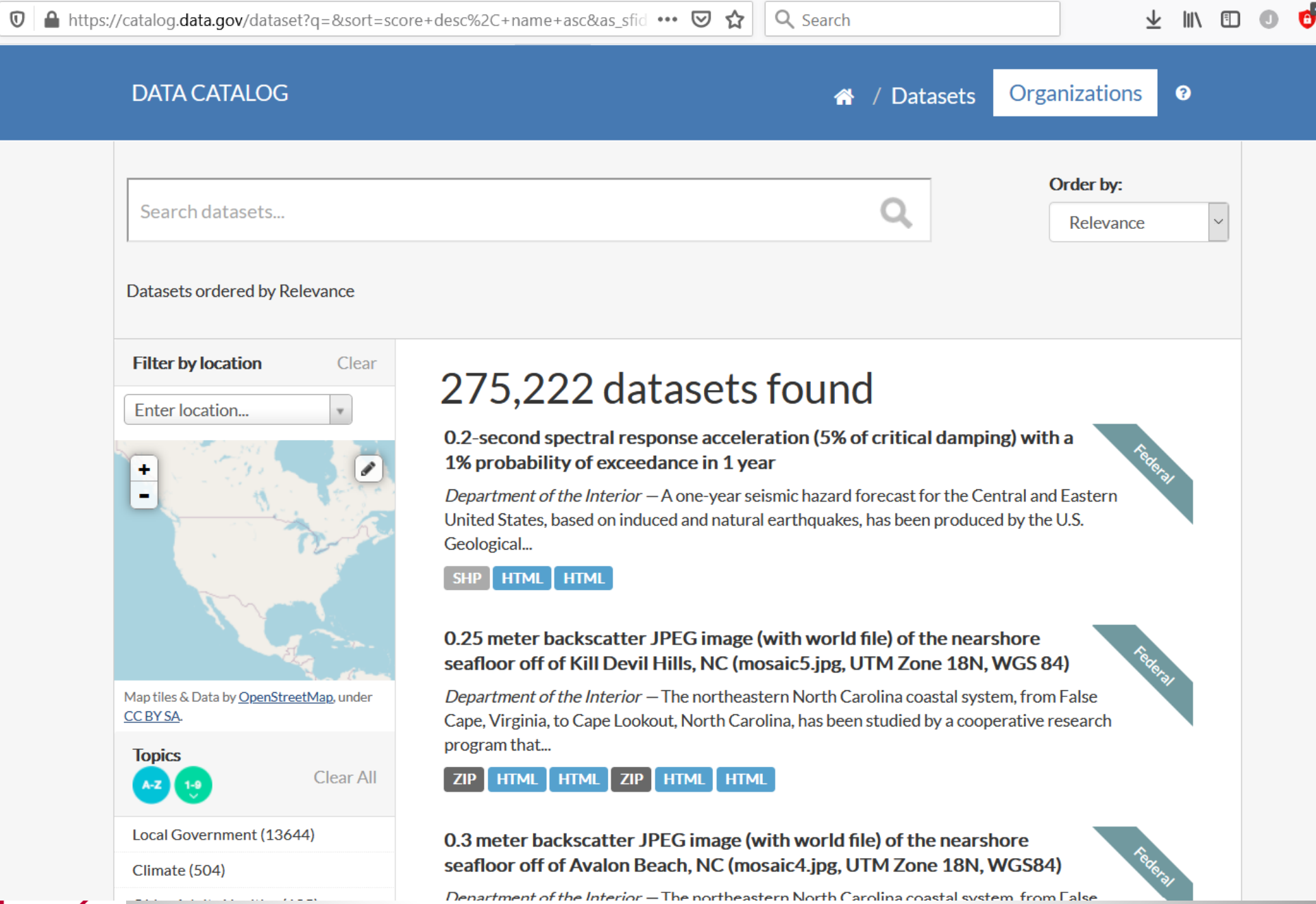
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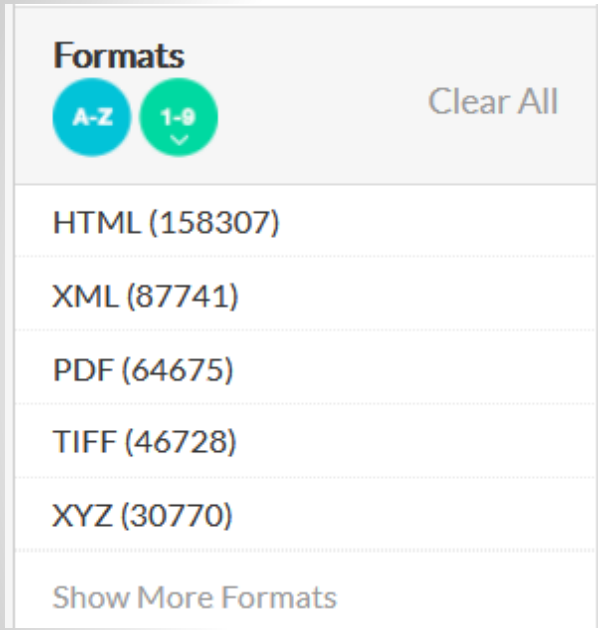
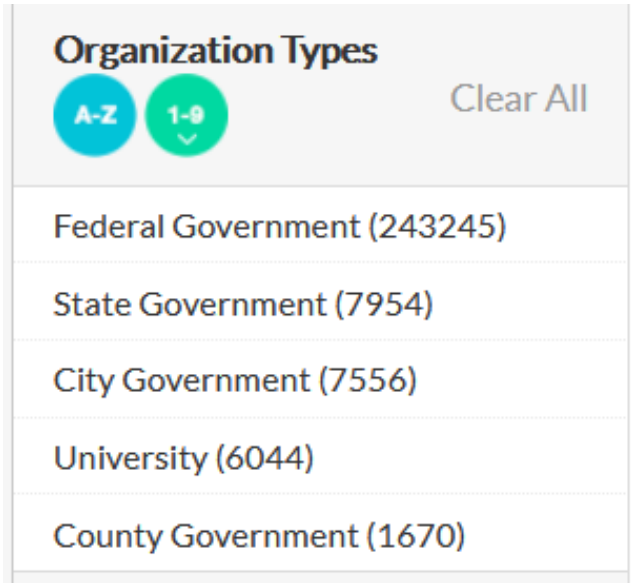
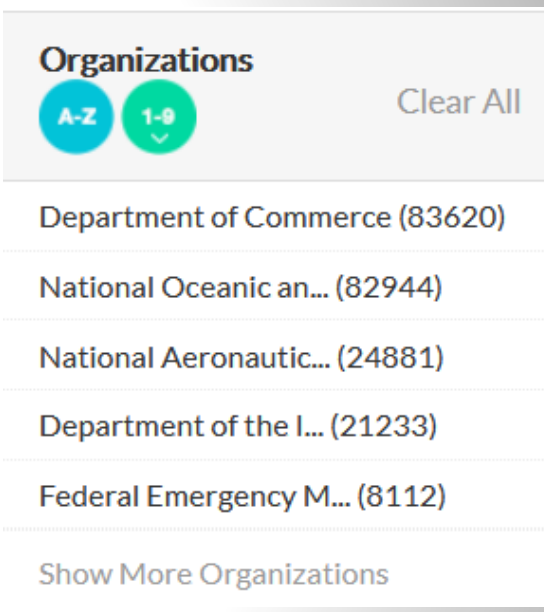
Examples of Data







https://www.census.gov/retail/index.html

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Monthly Retail Trade

Advance Monthly Retail Trade Report

Notice of Revision: This report no longer contains the most up to date estimates. Monthly retail sales estimates were revised on April 26, 2021 based on the results of the 2019 Annual Retail Trade Survey and Service Annual Survey and the results of the 2017 Economic Census.

Statement Regarding COVID-19 Impact: The Census Bureau continues to monitor response and data quality and has determined that estimates in this release meet publication standards. For more information, see COVID-19 FAQs.

The **March 2021** Advance Monthly Sales for Retail Trade and Food Services report was released on April 15, 2021 at 8:30 a.m., and available as:

- Full Publication in Excel [86KB] | PDF [320KB]
- Time Series (Adjusted Sales Data/Seasonal Factors—1992 to present)

Time Series/Trend Charts: Create your own customizable time series.

Monthly Retail Trade Report

Notice of Revision: Monthly retail sales, inventories, and inventories-to-sales ratios were revised on April 26, 2021 at 10:00 a.m. based on the results of the 2019 Annual Retail Trade Survey and Service Annual Survey and the results of the 2017 Economic Census.

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- Adjustment Factors for Seasonal and Other Variations of Monthly Estimates: Sales [8KB] | Inventories [3KB]
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NOW AVAILABLE! New monthly state retail sales data were published as an experimental data product for the first time on September 30, 2020. Please visit here for the data, interactive

Monthly Retail Trade

Advance Monthly Retail Trade Report

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Retail Trade Survey and Service Annual Survey and the results

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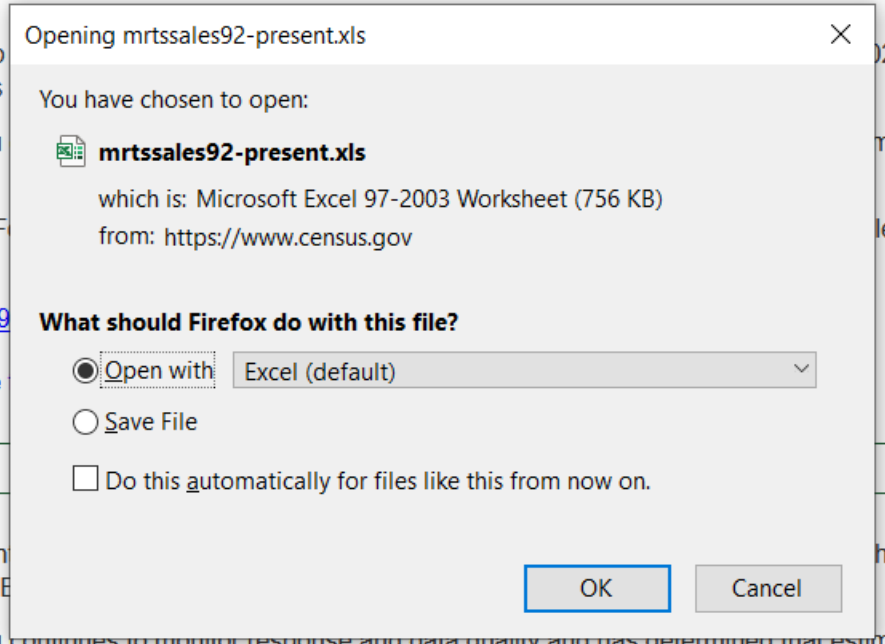

Monthly Retail Trade Report

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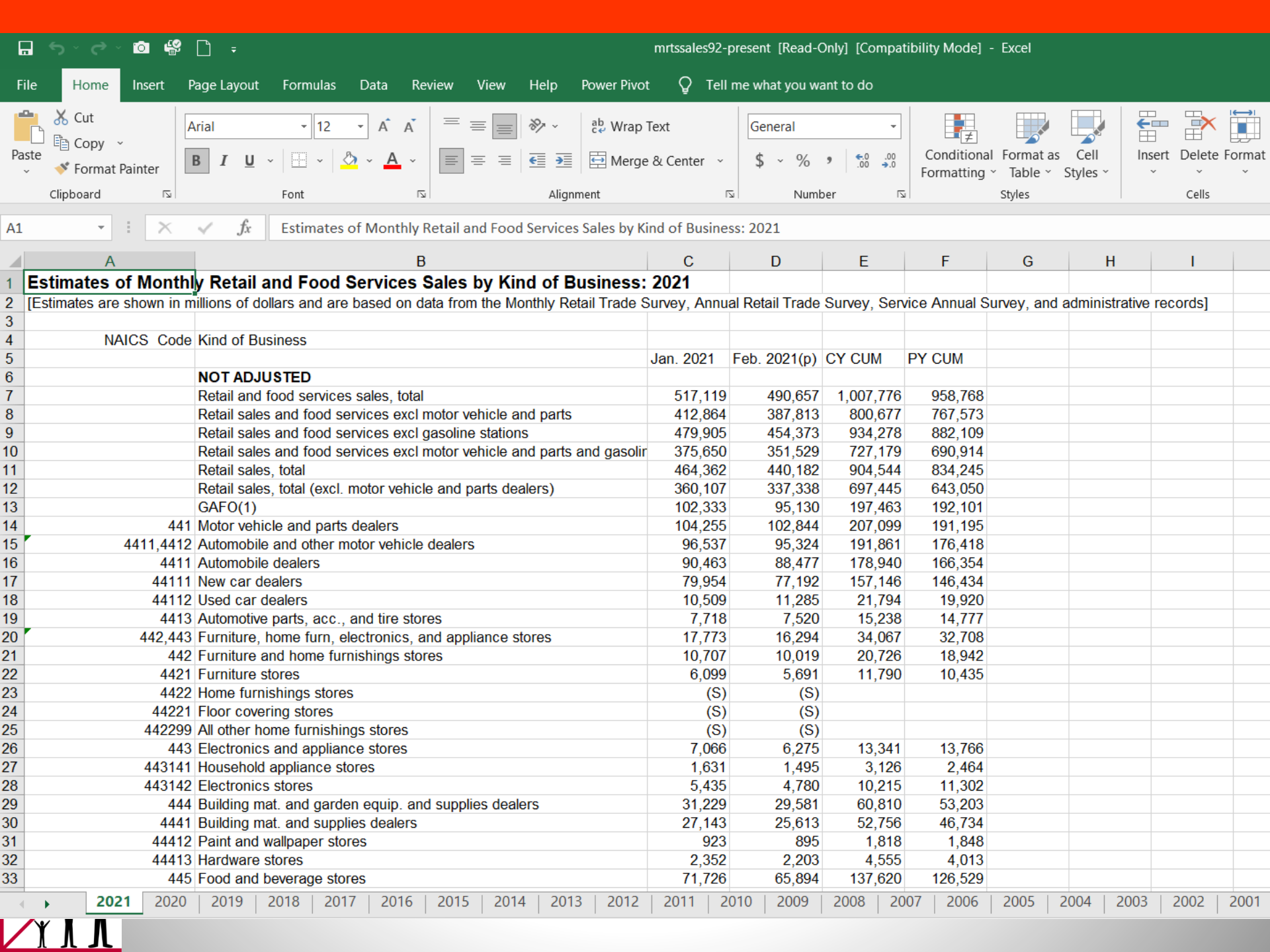
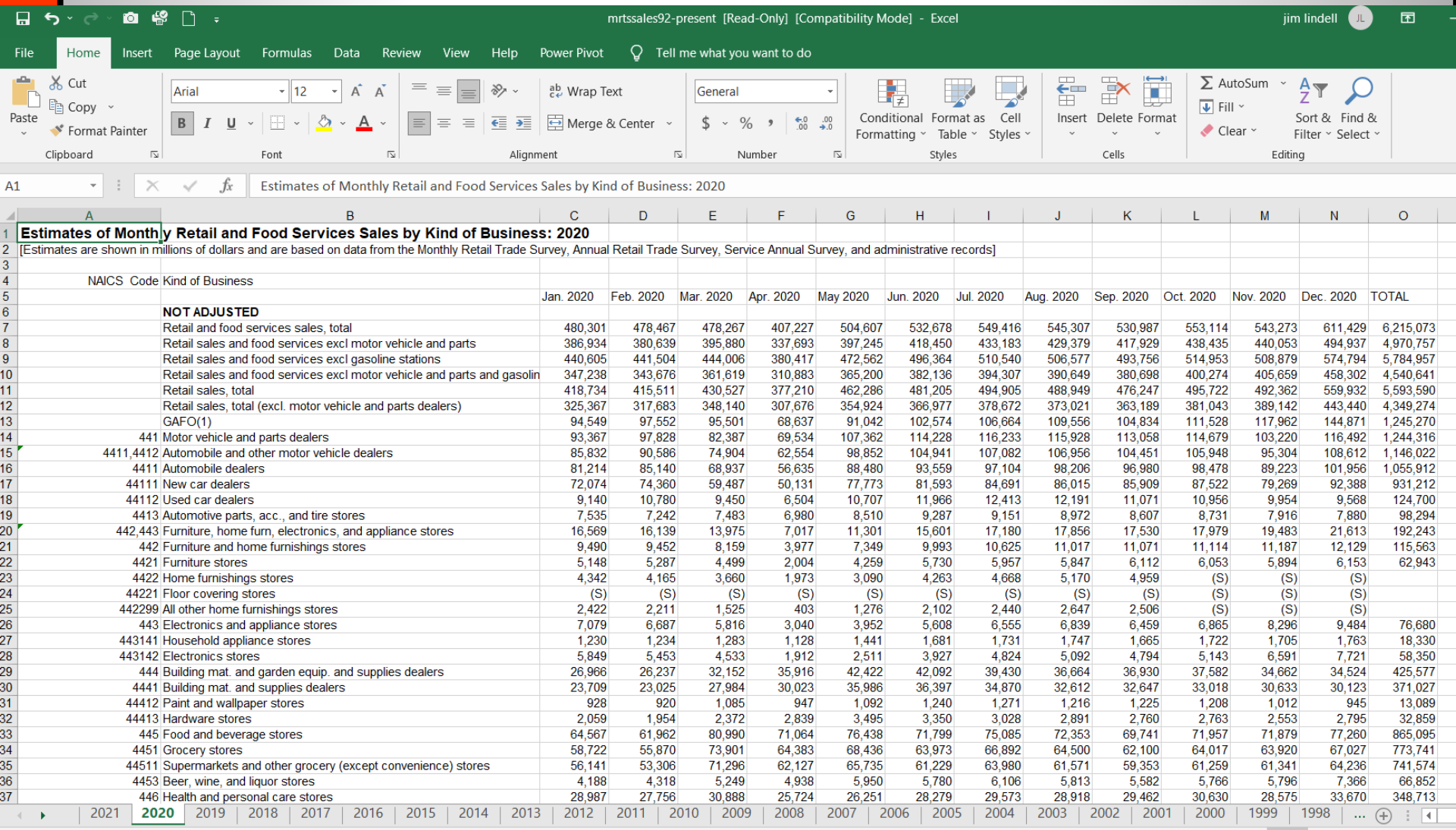
visualization, and documentation



Estimates of Monthly Retail and Food Services Sales by Kind of Business: 2021

[Estimates are shown in millions of dollars and are based on data from the Monthly Retail Trade Survey, Annual Retail Trade Survey, Service Annual Survey, and administrative records]

NAICS Code	Kind of Business	Jan. 2021	Feb. 2021(p)	CY CUM	PY CUM
	NOT ADJUSTED				
	Retail and food services sales, total	517,119	490,657	1,007,776	958,768
	Retail sales and food services excl motor vehicle and parts	412,864	387,813	800,677	767,573
	Retail sales and food services excl gasoline stations	479,905	454,373	934,278	882,109
	Retail sales and food services excl motor vehicle and parts and gasolin	375,650	351,529	727,179	690,914
	Retail sales, total	464,362	440,182	904,544	834,245
	Retail sales, total (excl. motor vehicle and parts dealers)	360,107	337,338	697,445	643,050
	GAFO(1)	102,333	95,130	197,463	192,101
441	Motor vehicle and parts dealers	104,255	102,844	207,099	191,195
4411,4412	Automobile and other motor vehicle dealers	96,537	95,324	191,861	176,418
4411	Automobile dealers	90,463	88,477	178,940	166,354
44111	New car dealers	79,954	77,192	157,146	146,434
44112	Used car dealers	10,509	11,285	21,794	19,920
4413	Automotive parts, acc., and tire stores	7,718	7,520	15,238	14,777
442,443	Furniture, home furn, electronics, and appliance stores	17,773	16,294	34,067	32,708
442	Furniture and home furnishings stores	10,707	10,019	20,726	18,942
4421	Furniture stores	6,099	5,691	11,790	10,435
4422	Home furnishings stores	(S)	(S)		
44221	Floor covering stores	(S)	(S)		
442299	All other home furnishings stores	(S)	(S)		
443	Electronics and appliance stores	7,066	6,275	13,341	13,766
443141	Household appliance stores	1,631	1,495	3,126	2,464
443142	Electronics stores	5,435	4,780	10,215	11,302
444	Building mat. and garden equip. and supplies dealers	31,229	29,581	60,810	53,203
4441	Building mat. and supplies dealers	27,143	25,613	52,756	46,734
44412	Paint and wallpaper stores	923	895	1,818	1,848
44413	Hardware stores	2,352	2,203	4,555	4,013
445	Food and beverage stores	71,726	65,894	137,620	126,529



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A1 Estimates of Monthly Retail and Food Services Sales by Kind of Business: 2020

Estimates of Monthly Retail and Food Services Sales by Kind of Business: 2020

[Estimates are shown in millions of dollars and are based on data from the Monthly Retail Trade Survey, Annual Retail Trade Survey, Service Annual Survey, and administrative records]

NAICS Code	Kind of Business	Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May 2020	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	TOTAL
	NOT ADJUSTED													
	Retail and food services sales, total	480,301	478,467	478,267	407,227	504,607	532,678	549,416	545,307	530,987	553,114	543,273	611,429	6,215,073
	Retail sales and food services excl motor vehicle and parts	386,934	380,639	395,880	337,693	397,245	418,450	433,183	429,379	417,929	438,435	440,053	494,937	4,970,757
	Retail sales and food services excl gasoline stations	440,605	441,504	444,006	380,417	472,562	496,364	510,540	506,577	493,756	514,953	508,879	574,794	5,784,957
	Retail sales and food services excl motor vehicle and parts and gasolin	347,238	343,676	361,619	310,883	365,200	382,136	394,307	390,649	380,698	400,274	405,659	458,302	4,540,641
	Retail sales, total	418,734	415,511	430,527	377,210	462,286	481,205	494,905	488,949	476,247	495,722	492,362	559,932	5,593,590
	Retail sales, total (excl. motor vehicle and parts dealers)	325,367	317,683	348,140	307,676	354,924	366,977	378,672	373,021	363,189	381,043	389,142	443,440	4,349,274
	GAFO(1)	94,549	97,552	95,501	68,637	91,042	102,574	106,664	109,556	104,834	111,528	117,962	144,871	1,245,270
441	Motor vehicle and parts dealers	93,367	97,828	82,387	69,534	107,362	114,228	116,233	115,928	113,058	114,679	103,220	116,492	1,244,316
4411,4412	Automobile and other motor vehicle dealers	85,832	90,586	74,904	62,554	98,852	104,941	107,082	106,956	104,451	105,948	95,304	108,612	1,146,022
4411	Automobile dealers	81,214	85,140	68,937	56,635	88,480	93,559	97,104	98,206	96,980	98,478	89,223	101,956	1,055,912
44111	New car dealers	72,074	74,360	59,487	50,131	77,773	81,593	84,691	86,015	85,909	87,522	79,269	92,388	931,212
44112	Used car dealers	9,140	10,780	9,450	6,504	10,707	11,966	12,413	12,191	11,071	10,956	9,954	9,568	124,700
4413	Automotive parts, acc., and tire stores	7,535	7,242	7,483	6,980	8,510	9,287	9,151	8,972	8,607	8,731	7,916	7,880	98,294
442,443	Furniture, home furn, electronics, and appliance stores	16,569	16,139	13,975	7,017	11,301	15,601	17,180	17,856	17,530	17,979	19,483	21,613	192,243
442	Furniture and home furnishings stores	9,490	9,452	8,159	3,977	7,349	9,993	10,625	11,017	11,071	11,114	11,187	12,129	115,563
4421	Furniture stores	5,148	5,287	4,499	2,004	4,259	5,730	5,957	5,847	6,112	6,053	5,894	6,153	62,943
4422	Home furnishings stores	4,342	4,165	3,660	1,973	3,090	4,263	4,668	5,170	4,959	(S)	(S)	(S)	
44221	Floor covering stores	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	
442299	All other home furnishings stores	2,422	2,211	1,525	403	1,276	2,102	2,440	2,647	2,506	(S)	(S)	(S)	
443	Electronics and appliance stores	7,079	6,687	5,816	3,040	3,952	5,608	6,555	6,839	6,459	6,865	8,296	9,484	76,680
443141	Household appliance stores	1,230	1,234	1,283	1,128	1,441	1,681	1,731	1,747	1,665	1,722	1,705	1,763	18,330
443142	Electronics stores	5,849	5,453	4,533	1,912	2,511	3,927	4,824	5,092	4,794	5,143	6,591	7,721	58,350
444	Building mat. and garden equip. and supplies dealers	26,966	26,237	32,152	35,916	42,422	42,092	39,430	36,664	36,930	37,582	34,662	34,524	425,577
4441	Building mat. and supplies dealers	23,709	23,025	27,984	30,023	35,986	36,397	34,870	32,612	32,647	33,018	30,633	30,123	371,027
44412	Paint and wallpaper stores	928	920	1,085	947	1,092	1,240	1,271	1,216	1,225	1,208	1,012	945	13,089
44413	Hardware stores	2,059	1,954	2,372	2,839	3,495	3,350	3,028	2,891	2,760	2,763	2,553	2,795	32,859
445	Food and beverage stores	64,567	61,962	80,990	71,064	76,438	71,799	75,085	72,353	69,741	71,957	71,879	77,260	865,095
4451	Grocery stores	58,722	55,870	73,901	64,383	68,436	63,973	66,892	64,500	62,100	64,017	63,920	67,027	773,741
44511	Supermarkets and other grocery (except convenience) stores	56,141	53,306	71,296	62,127	65,735	61,229	63,980	61,571	59,353	61,259	61,341	64,236	741,574
4453	Beer, wine, and liquor stores	4,188	4,318	5,249	4,938	5,950	5,780	6,106	5,813	5,582	5,766	5,796	7,366	66,852
446	Health and personal care stores	28,987	27,756	30,888	25,724	26,251	28,279	29,573	28,918	29,462	30,630	28,575	33,670	348,713

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Monthly Retail Trade

Advance Monthly Retail Trade Report

Notice of Revision: This report no longer contains the most up 021 based on the results of the 20
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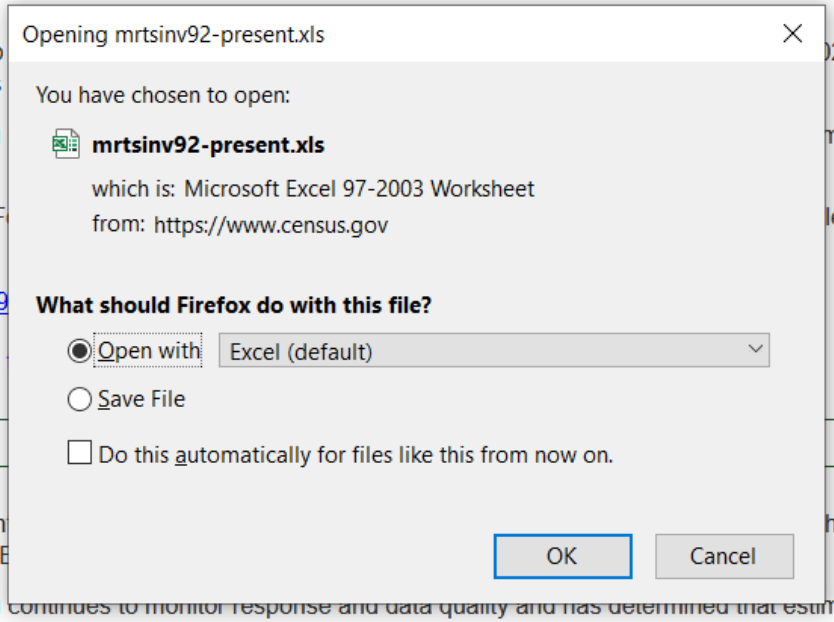

Monthly Retail Trade Report

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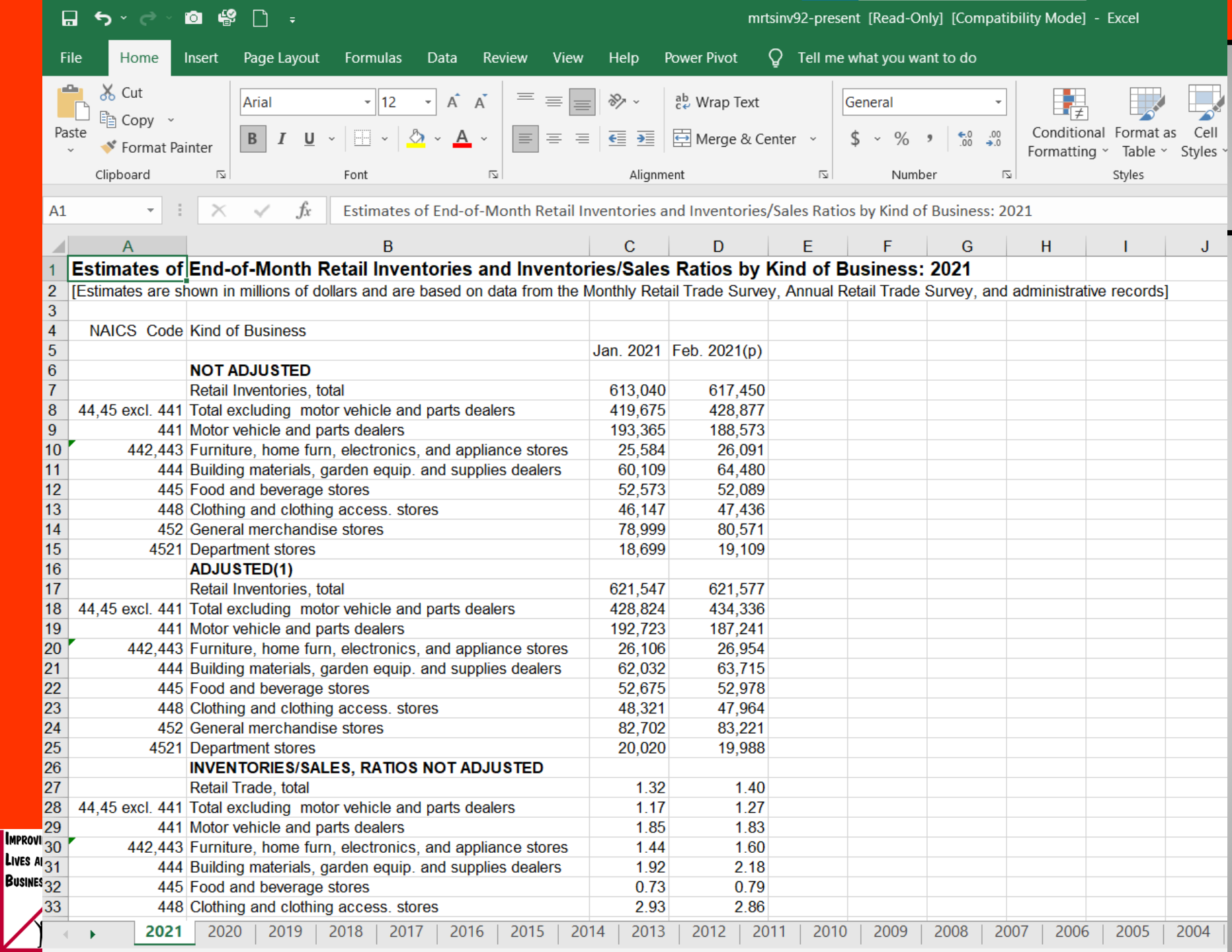
Latest Quarterly E-Commerce Report



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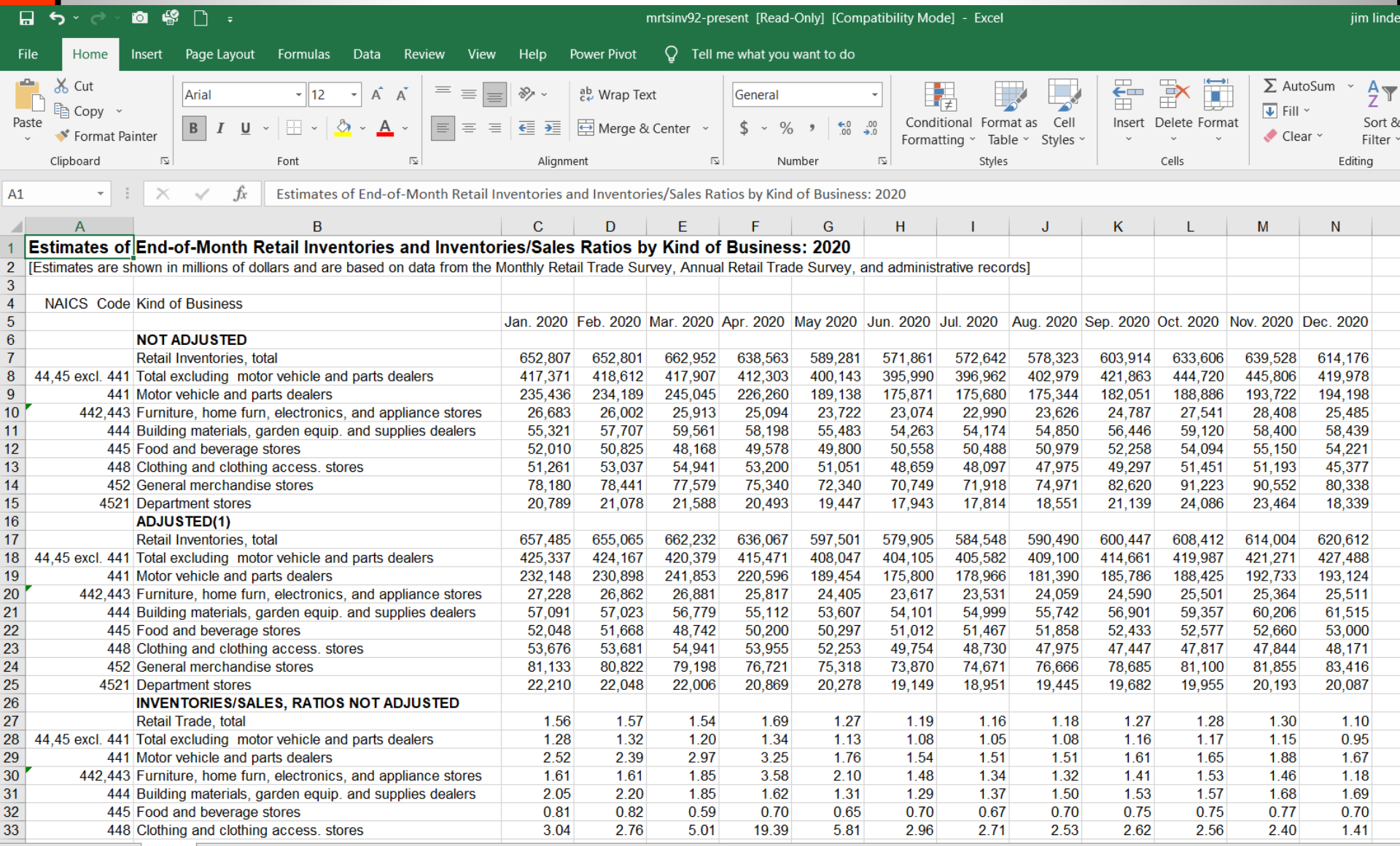
A1 Estimates of End-of-Month Retail Inventories and Inventories/Sales Ratios by Kind of Business: 2021

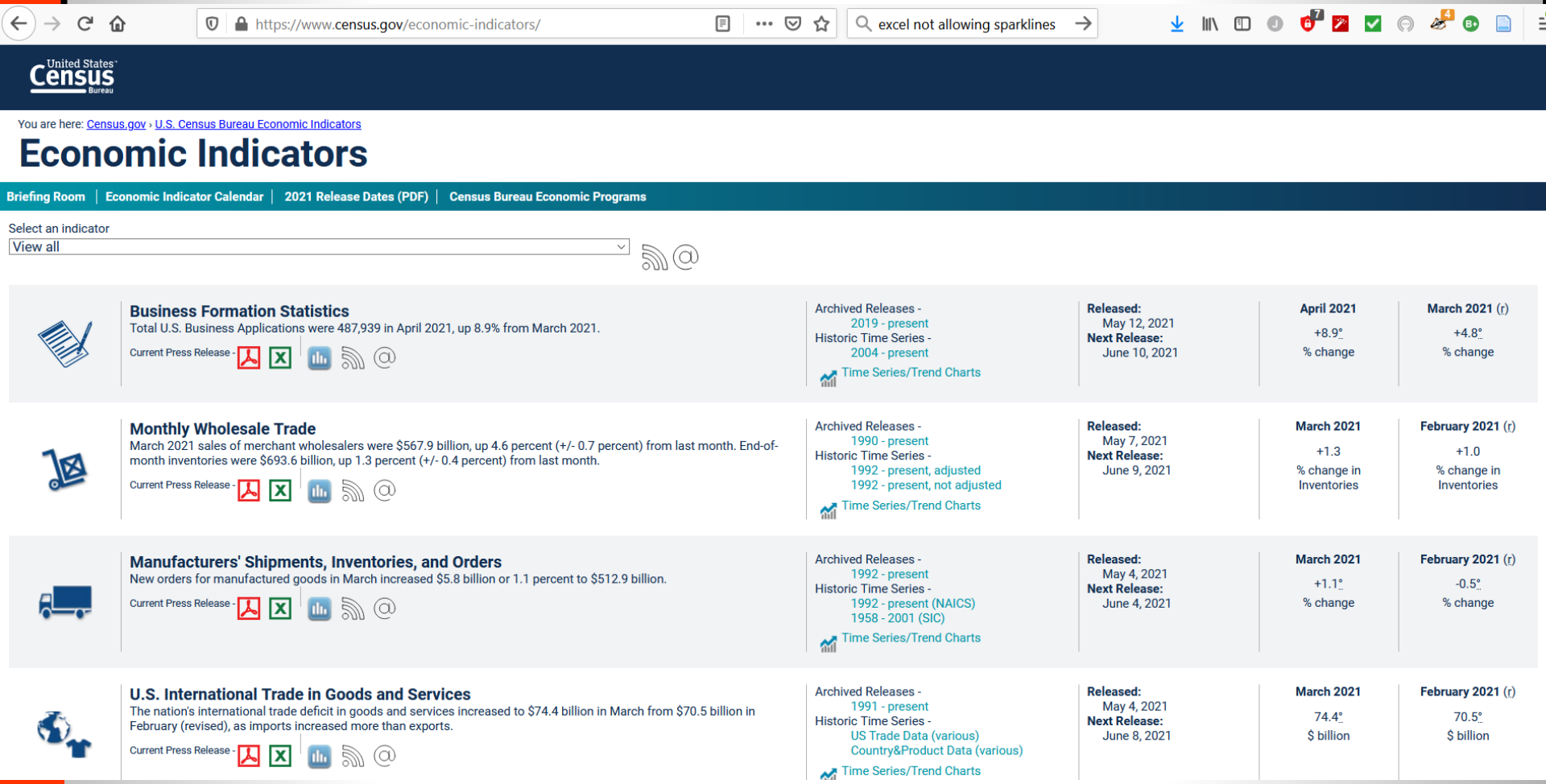
	A	B	C	D	E	F	G	H	I	J
1	**Estimates of**	**End-of-Month Retail Inventories and Inventories/Sales Ratios by Kind of Business: 2021**								
2	[Estimates are shown in millions of dollars and are based on data from the Monthly Retail Trade Survey, Annual Retail Trade Survey, and administrative records]									
3										
4	NAICS Code	Kind of Business								
5			Jan. 2021	Feb. 2021(p)						
6		**NOT ADJUSTED**								
7		Retail Inventories, total	613,040	617,450						
8	44,45 excl. 441	Total excluding motor vehicle and parts dealers	419,675	428,877						
9	441	Motor vehicle and parts dealers	193,365	188,573						
10	442,443	Furniture, home furn, electronics, and appliance stores	25,584	26,091						
11	444	Building materials, garden equip. and supplies dealers	60,109	64,480						
12	445	Food and beverage stores	52,573	52,089						
13	448	Clothing and clothing access. stores	46,147	47,436						
14	452	General merchandise stores	78,999	80,571						
15	4521	Department stores	18,699	19,109						
16		**ADJUSTED(1)**								
17		Retail Inventories, total	621,547	621,577						
18	44,45 excl. 441	Total excluding motor vehicle and parts dealers	428,824	434,336						
19	441	Motor vehicle and parts dealers	192,723	187,241						
20	442,443	Furniture, home furn, electronics, and appliance stores	26,106	26,954						
21	444	Building materials, garden equip. and supplies dealers	62,032	63,715						
22	445	Food and beverage stores	52,675	52,978						
23	448	Clothing and clothing access. stores	48,321	47,964						
24	452	General merchandise stores	82,702	83,221						
25	4521	Department stores	20,020	19,988						
26		**INVENTORIES/SALES, RATIOS NOT ADJUSTED**								
27		Retail Trade, total	1.32	1.40						
28	44,45 excl. 441	Total excluding motor vehicle and parts dealers	1.17	1.27						
29	441	Motor vehicle and parts dealers	1.85	1.83						
30	442,443	Furniture, home furn, electronics, and appliance stores	1.44	1.60						
31	444	Building materials, garden equip. and supplies dealers	1.92	2.18						
32	445	Food and beverage stores	0.73	0.79						
33	448	Clothing and clothing access. stores	2.93	2.86						

2021 2020 2019 2018 2017 2016 2015 2014 2013 2012 2011 2010 2009 2008 2007 2006 2005 2004

IMPROVI LIVES A BUSINES



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Estimates of**	**End-of-Month Retail Inventories and Inventories/Sales Ratios by Kind of Business: 2020**												
2	[Estimates are shown in millions of dollars and are based on data from the Monthly Retail Trade Survey, Annual Retail Trade Survey, and administrative records]													
3														
4	NAICS Code	Kind of Business												
5			Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May 2020	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020
6		**NOT ADJUSTED**												
7		Retail Inventories, total	652,807	652,801	662,952	638,563	589,281	571,861	572,642	578,323	603,914	633,606	639,528	614,176
8	44,45 excl. 441	Total excluding motor vehicle and parts dealers	417,371	418,612	417,907	412,303	400,143	395,990	396,962	402,979	421,863	444,720	445,806	419,978
9	441	Motor vehicle and parts dealers	235,436	234,189	245,045	226,260	189,138	175,871	175,680	175,344	182,051	188,886	193,722	194,198
10	442,443	Furniture, home furn, electronics, and appliance stores	26,683	26,002	25,913	25,094	23,722	23,074	22,990	23,626	24,787	27,541	28,408	25,485
11	444	Building materials, garden equip. and supplies dealers	55,321	57,707	59,561	58,198	55,483	54,263	54,174	54,850	56,446	59,120	58,400	58,439
12	445	Food and beverage stores	52,010	50,825	48,168	49,578	49,800	50,558	50,488	50,979	52,258	54,094	55,150	54,221
13	448	Clothing and clothing access. stores	51,261	53,037	54,941	53,200	51,051	48,659	48,097	47,975	49,297	51,451	51,193	45,377
14	452	General merchandise stores	78,180	78,441	77,579	75,340	72,340	70,749	71,918	74,971	82,620	91,223	90,552	80,338
15	4521	Department stores	20,789	21,078	21,588	20,493	19,447	17,943	17,814	18,551	21,139	24,086	23,464	18,339
16		**ADJUSTED(1)**												
17		Retail Inventories, total	657,485	655,065	662,232	636,067	597,501	579,905	584,548	590,490	600,447	608,412	614,004	620,612
18	44,45 excl. 441	Total excluding motor vehicle and parts dealers	425,337	424,167	420,379	415,471	408,047	404,105	405,582	409,100	414,661	419,987	421,271	427,488
19	441	Motor vehicle and parts dealers	232,148	230,898	241,853	220,596	189,454	175,800	178,966	181,390	185,786	188,425	192,733	193,124
20	442,443	Furniture, home furn, electronics, and appliance stores	27,228	26,862	26,881	25,817	24,405	23,617	23,531	24,059	24,590	25,501	25,364	25,511
21	444	Building materials, garden equip. and supplies dealers	57,091	57,023	56,779	55,112	53,607	54,101	54,999	55,742	56,901	59,357	60,206	61,515
22	445	Food and beverage stores	52,048	51,668	48,742	50,200	50,297	51,012	51,467	51,858	52,433	52,577	52,660	53,000
23	448	Clothing and clothing access. stores	53,676	53,681	54,941	53,955	52,253	49,754	48,730	47,975	47,447	47,817	47,844	48,171
24	452	General merchandise stores	81,133	80,822	79,198	76,721	75,318	73,870	74,671	76,666	78,685	81,100	81,855	83,416
25	4521	Department stores	22,210	22,048	22,006	20,869	20,278	19,149	18,951	19,445	19,682	19,955	20,193	20,087
26		**INVENTORIES/SALES, RATIOS NOT ADJUSTED**												
27		Retail Trade, total	1.56	1.57	1.54	1.69	1.27	1.19	1.16	1.18	1.27	1.28	1.30	1.10
28	44,45 excl. 441	Total excluding motor vehicle and parts dealers	1.28	1.32	1.20	1.34	1.13	1.08	1.05	1.08	1.16	1.17	1.15	0.95
29	441	Motor vehicle and parts dealers	2.52	2.39	2.97	3.25	1.76	1.54	1.51	1.51	1.61	1.65	1.88	1.67
30	442,443	Furniture, home furn, electronics, and appliance stores	1.61	1.61	1.85	3.58	2.10	1.48	1.34	1.32	1.41	1.53	1.46	1.18
31	444	Building materials, garden equip. and supplies dealers	2.05	2.20	1.85	1.62	1.31	1.29	1.37	1.50	1.53	1.57	1.68	1.69
32	445	Food and beverage stores	0.81	0.82	0.59	0.70	0.65	0.70	0.67	0.70	0.75	0.75	0.77	0.70
33	448	Clothing and clothing access. stores	3.04	2.76	5.01	19.39	5.81	2.96	2.71	2.53	2.62	2.56	2.40	1.41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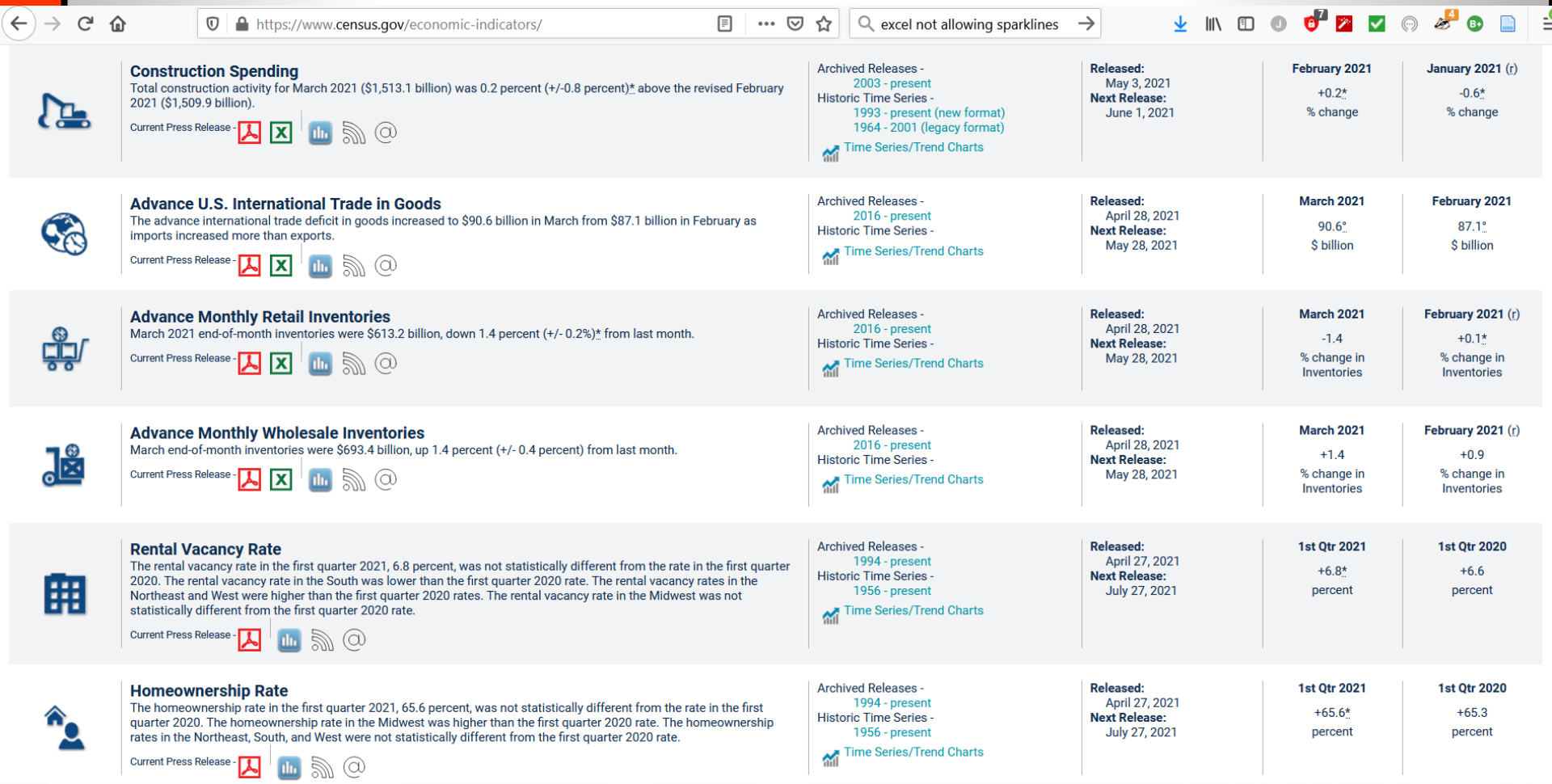
Business Formation Statistics
Total U.S. Business Applications were 487,939 in April 2021, up 8.9% from March 2021.
Current Press Release -
Archived Releases - 2019 - present
Historic Time Series - 2004 - present
Time Series/Trend Charts
Released: May 12, 2021
Next Release: June 10, 2021
April 2021 +8.9* % change
March 2021 (r) +4.8* % change
Monthly Wholesale Trade
March 2021 sales of merchant wholesalers were $567.9 billion, up 4.6 percent (+/- 0.7 percent) from last month. End-of-month inventories were $693.6 billion, up 1.3 percent (+/- 0.4 percent) from last month.
Current Press Release -
Archived Releases - 1990 - present
Historic Time Series - 1992 - present, adjusted
1992 - present, not adjusted
Time Series/Trend Charts
Released: May 7, 2021
Next Release: June 9, 2021
March 2021 +1.3 % change in Inventories
February 2021 (r) +1.0 % change in Inventories
Manufacturers' Shipments, Inventories, and Orders
New orders for manufactured goods in March increased $5.8 billion or 1.1 percent to $512.9 billion.
Current Press Release -
Archived Releases - 1992 - present
Historic Time Series - 1992 - present (NAICS)
1958 - 2001 (SIC)
Time Series/Trend Charts
Released: May 4, 2021
Next Release: June 4, 2021
March 2021 +1.1* % change
February 2021 (r) -0.5* % change
U.S. International Trade in Goods and Services
The nation's international trade deficit in goods and services increased to $74.4 billion in March from $70.5 billion in February (revised), as imports increased more than exports.
Current Press Release -
Archived Releases - 1991 - present
Historic Time Series - US Trade Data (various)
Country&Product Data (various)
Time Series/Trend Charts
Released: May 4, 2021
Next Release: June 8, 2021
March 2021 74.4* $ billion
February 2021 (r) 70.5* $ billion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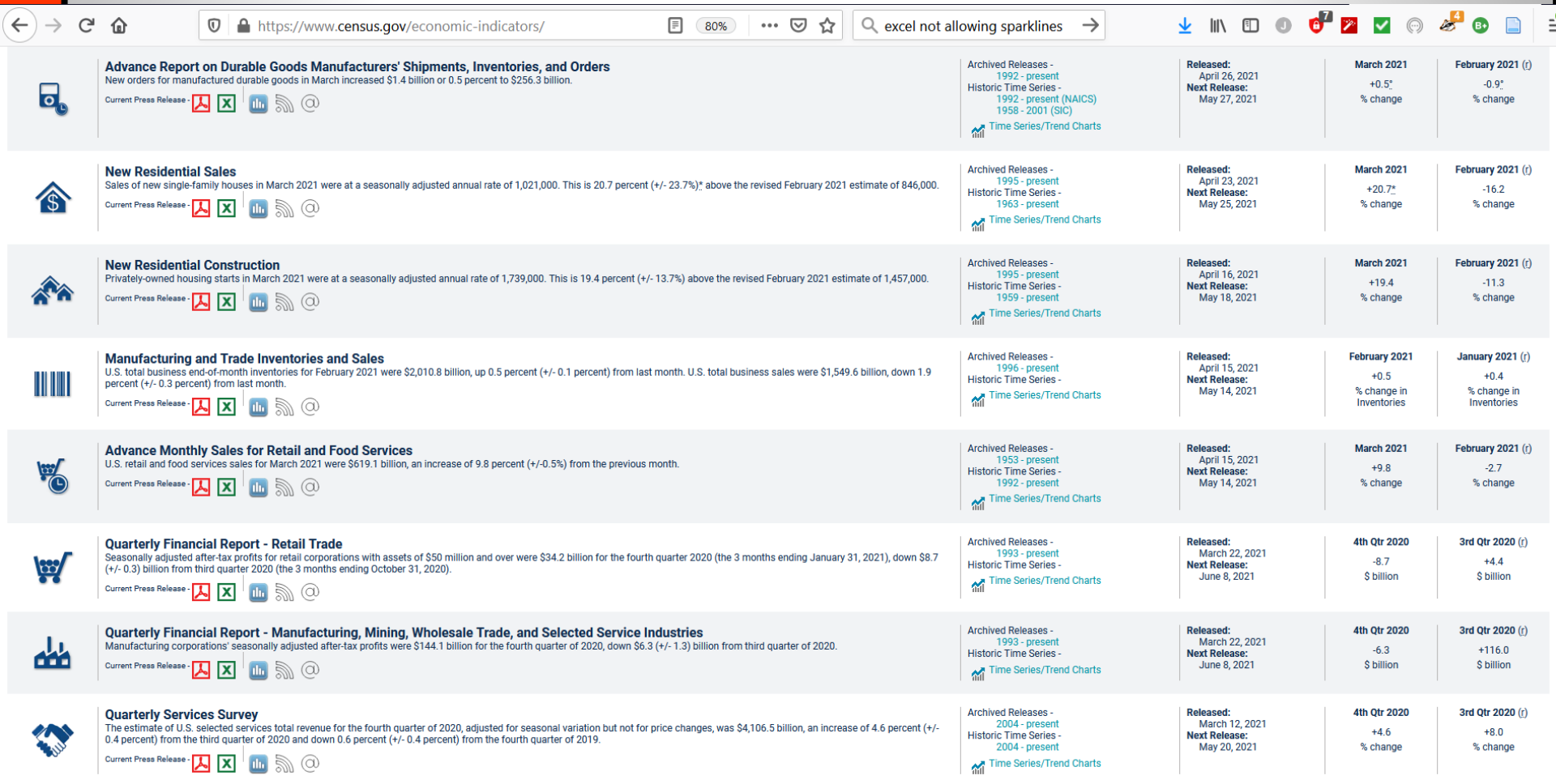
Construction Spending
Total construction activity for March 2021 ($1,513.1 billion) was 0.2 percent (+/-0.8 percent)* above the revised February 2021 ($1,509.9 billion).
Current Press Release -
Archived Releases - 2003 - present
Historic Time Series - 1993 - present (new format) 1964 - 2001 (legacy format)
Time Series/Trend Charts
Released: May 3, 2021
Next Release: June 1, 2021
February 2021 +0.2* % change
January 2021 (r) -0.6* % change
Advance U.S. International Trade in Goods
The advance international trade deficit in goods increased to $90.6 billion in March from $87.1 billion in February as imports increased more than exports.
Current Press Release -
Archived Releases - 2016 - present
Historic Time Series -
Time Series/Trend Charts
Released: April 28, 2021
Next Release: May 28, 2021
March 2021 90.6* $ billion
February 2021 87.1* $ billion
Advance Monthly Retail Inventories
March 2021 end-of-month inventories were $613.2 billion, down 1.4 percent (+/- 0.2%)* from last month.
Current Press Release -
Archived Releases - 2016 - present
Historic Time Series -
Time Series/Trend Charts
Released: April 28, 2021
Next Release: May 28, 2021
March 2021 -1.4 % change in Inventories
February 2021 (r) +0.1* % change in Inventories
Advance Monthly Wholesale Inventories
March end-of-month inventories were $693.4 billion, up 1.4 percent (+/- 0.4 percent) from last month.
Current Press Release -
Archived Releases - 2016 - present
Historic Time Series -
Time Series/Trend Charts
Released: April 28, 2021
Next Release: May 28, 2021
March 2021 +1.4 % change in Inventories
February 2021 (r) +0.9 % change in Inventories
Rental Vacancy Rate
The rental vacancy rate in the first quarter 2021, 6.8 percent, was not statistically different from the rate in the first quarter 2020. The rental vacancy rate in the South was lower than the first quarter 2020 rate. The rental vacancy rates in the Northeast and West were higher than the first quarter 2020 rates. The rental vacancy rate in the Midwest was not statistically different from the first quarter 2020 rate.
Current Press Release -
Archived Releases - 1994 - present
Historic Time Series - 1956 - present
Time Series/Trend Charts
Released: April 27, 2021
Next Release: July 27, 2021
1st Qtr 2021 +6.8* percent
1st Qtr 2020 +6.6 percent
Homeownership Rate
The homeownership rate in the first quarter 2021, 65.6 percent, was not statistically different from the rate in the first quarter 2020. The homeownership rate in the Midwest was higher than the first quarter 2020 rate. The homeownership rates in the Northeast, South, and West were not statistically different from the first quarter 2020 rate.
Current Press Release -
Archived Releases - 1994 - present
Historic Time Series - 1956 - present
Time Series/Trend Charts
Released: April 27, 2021
Next Release: July 27, 2021
1st Qtr 2021 +65.6* percent
1st Qtr 2020 +65.3 percent



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Key Features:

- One-click instant download of economic time series.
- Browse the most popular data and search the FRED database.
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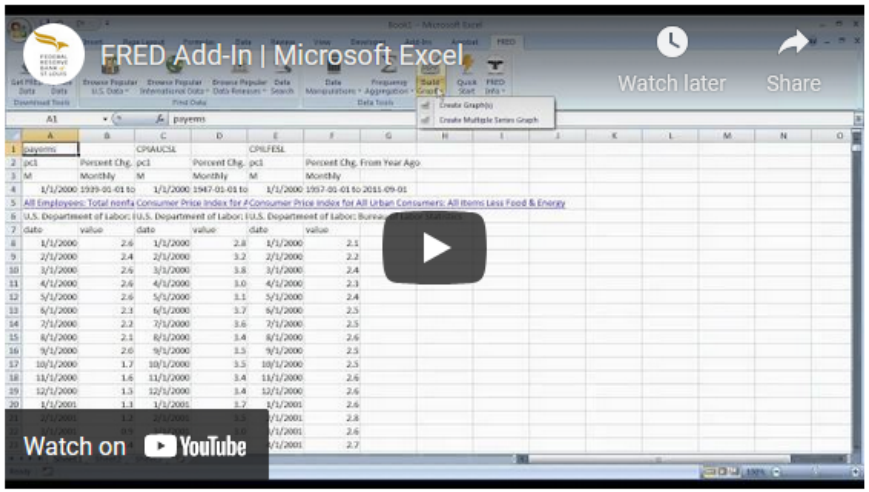
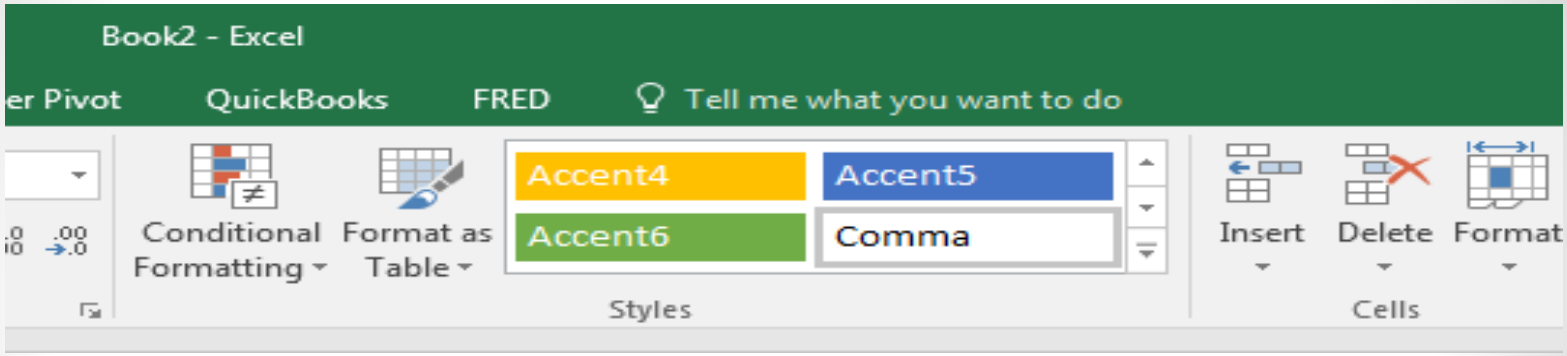
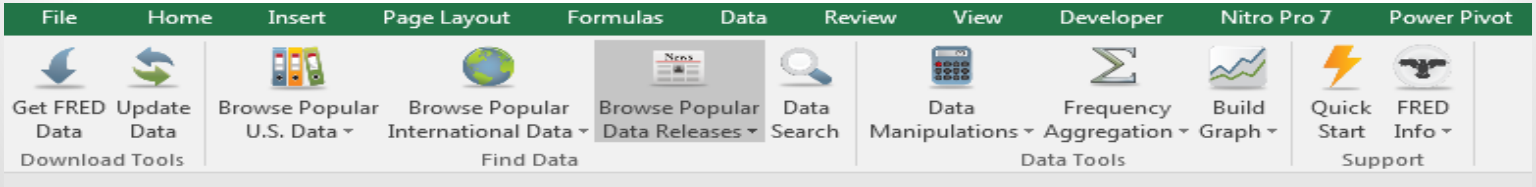
- Create graphs with NBER recession shading and an auto update feature.



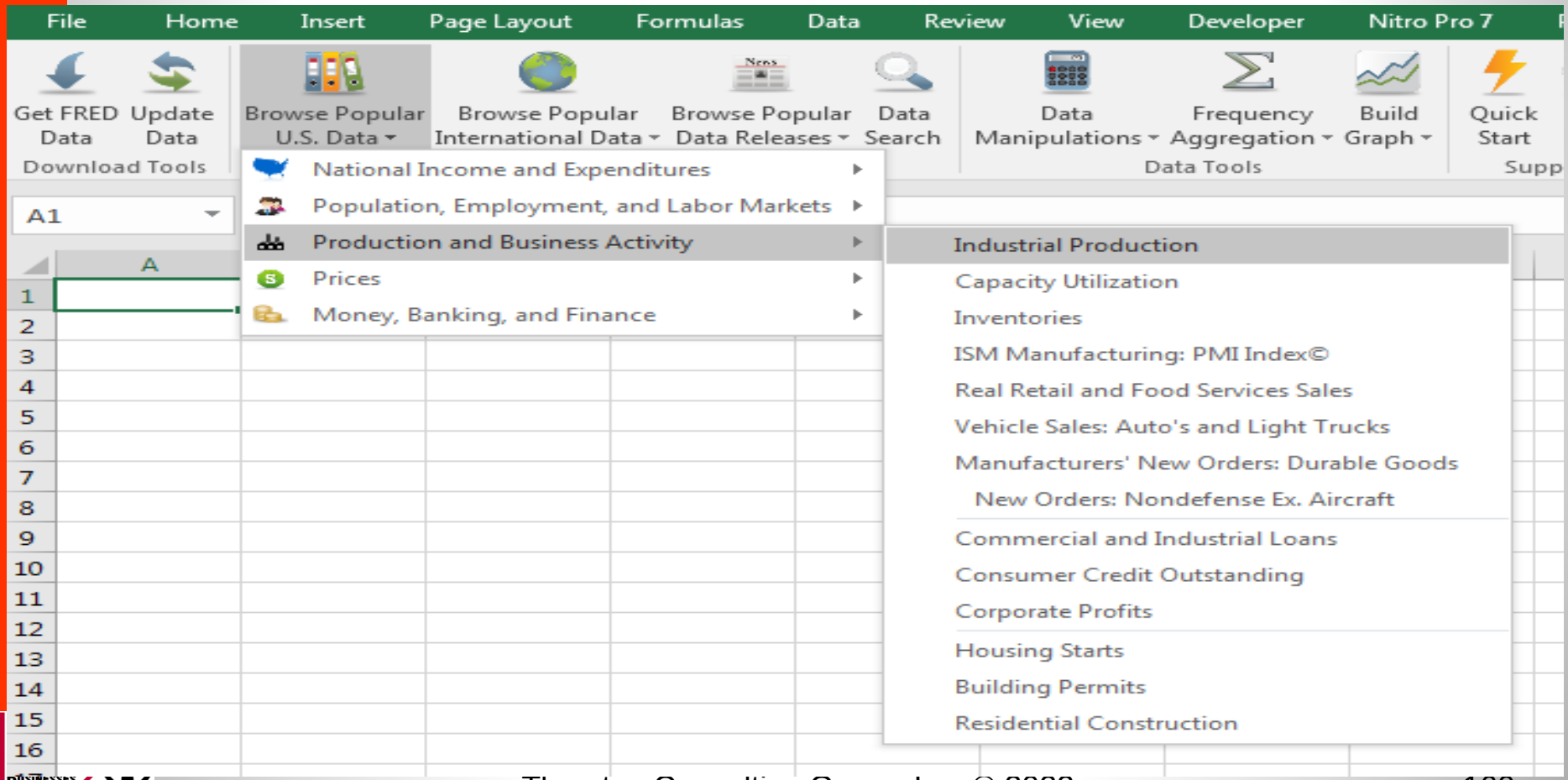
View demo video of new features in Add-in for Excel 2010 and 2013

Accessing Data: Federal Reserve Bank of St. Louis

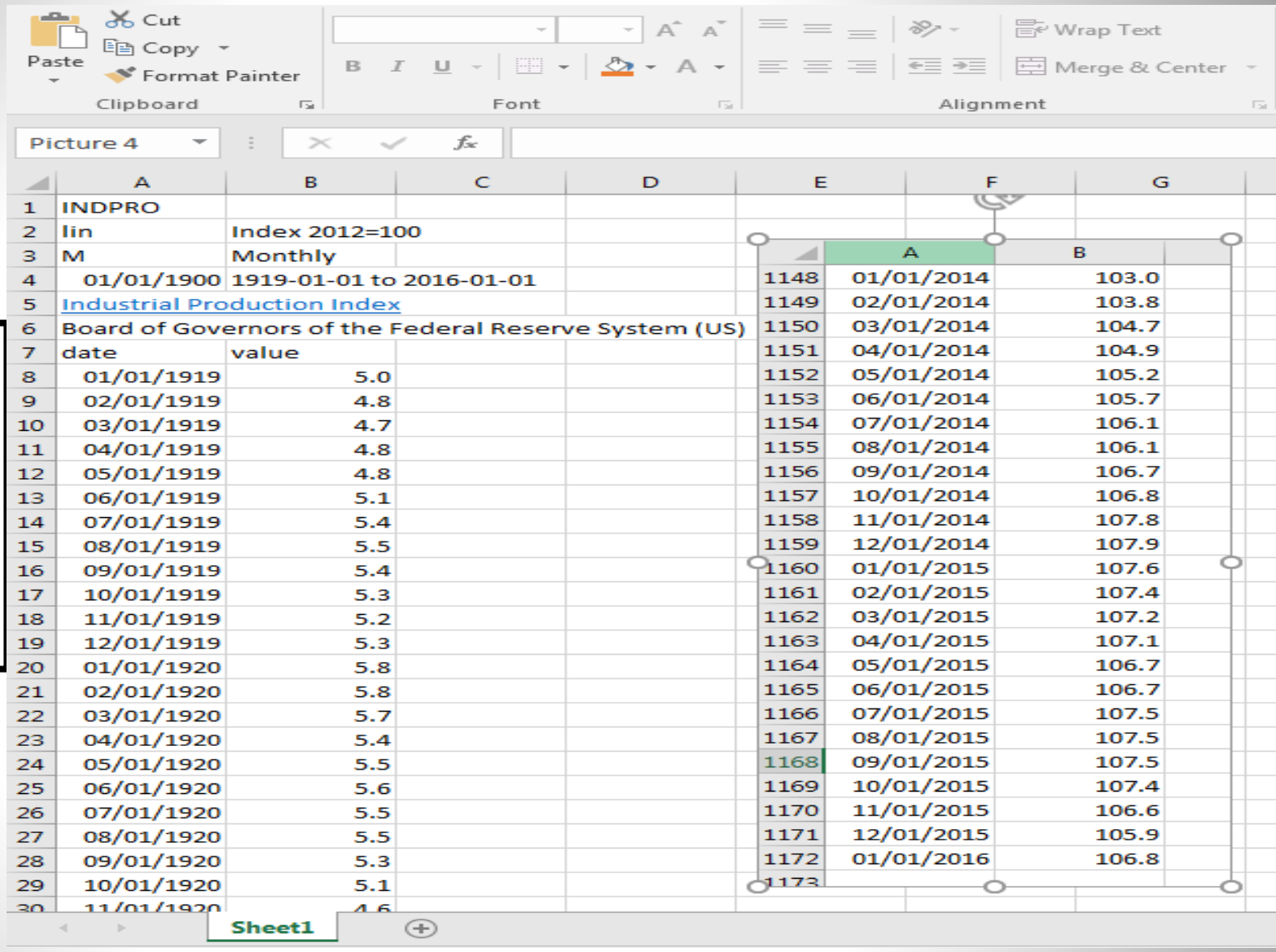




Accessing Data—Industrial Production Federal Reserve Bank of St. Louis



Data—Industrial Production Index Federal Reserve Bank of St. Louis



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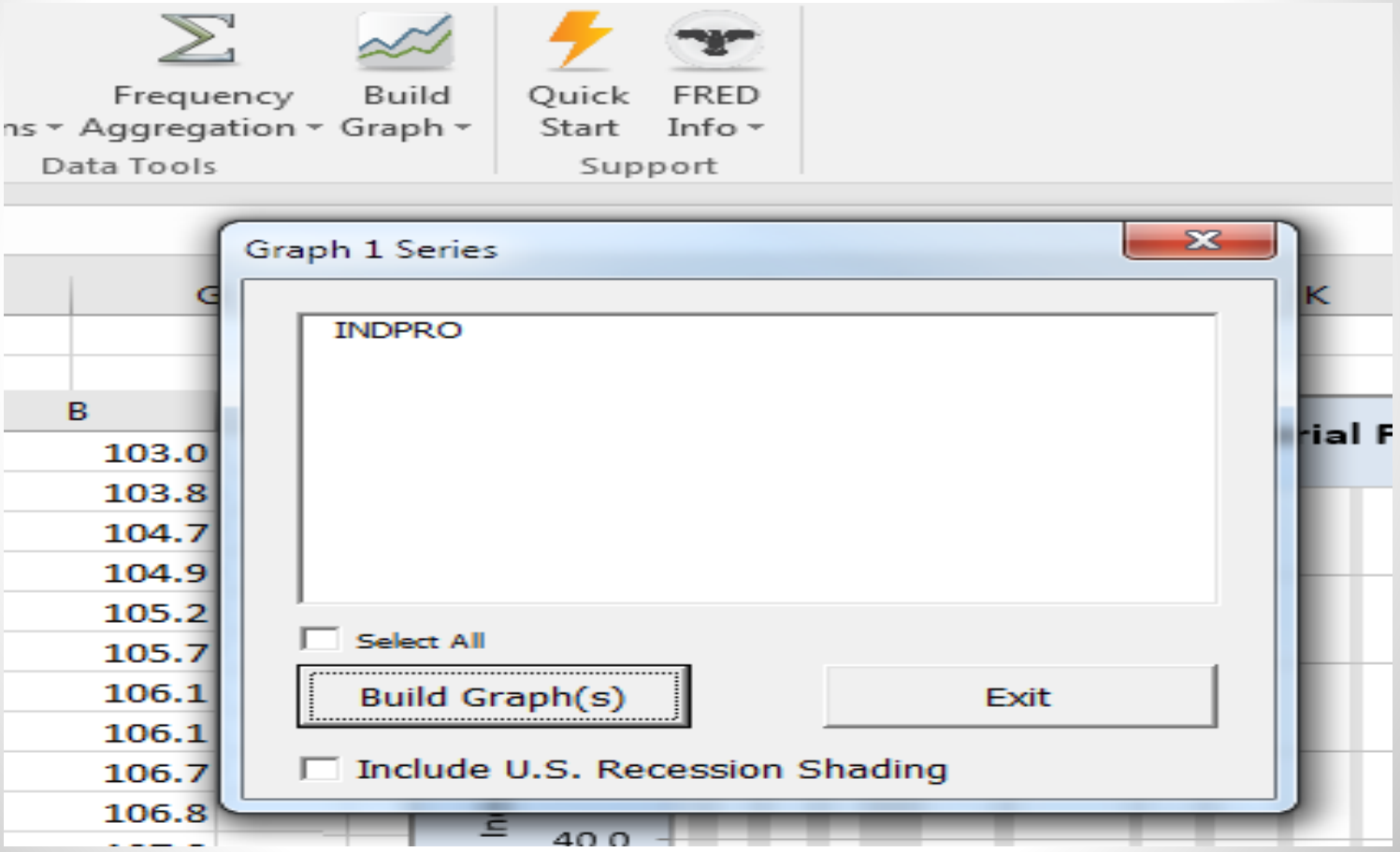
Picture 4

	A	B	C	D	E	F	G
1	INDPRO						
2	lin	Index 2012=100					
3	M	Monthly					
4	01/01/1900	1919-01-01 to 2016-01-01					
5	Industrial Production Index						
6	Board of Governors of the Federal Reserve System (US)						
7	date	value					
8	01/01/1919	5.0					
9	02/01/1919	4.8					
10	03/01/1919	4.7					
11	04/01/1919	4.8					
12	05/01/1919	4.8					
13	06/01/1919	5.1					
14	07/01/1919	5.4					
15	08/01/1919	5.5					
16	09/01/1919	5.4					
17	10/01/1919	5.3					
18	11/01/1919	5.2					
19	12/01/1919	5.3					
20	01/01/1920	5.8					
21	02/01/1920	5.8					
22	03/01/1920	5.7					
23	04/01/1920	5.4					
24	05/01/1920	5.5					
25	06/01/1920	5.6					
26	07/01/1920	5.5					
27	08/01/1920	5.5					
28	09/01/1920	5.3					
29	10/01/1920	5.1					
30	11/01/1920	4.6					

	A	B
1148	01/01/2014	103.0
1149	02/01/2014	103.8
1150	03/01/2014	104.7
1151	04/01/2014	104.9
1152	05/01/2014	105.2
1153	06/01/2014	105.7
1154	07/01/2014	106.1
1155	08/01/2014	106.1
1156	09/01/2014	106.7
1157	10/01/2014	106.8
1158	11/01/2014	107.8
1159	12/01/2014	107.9
1160	01/01/2015	107.6
1161	02/01/2015	107.4
1162	03/01/2015	107.2
1163	04/01/2015	107.1
1164	05/01/2015	106.7
1165	06/01/2015	106.7
1166	07/01/2015	107.5
1167	08/01/2015	107.5
1168	09/01/2015	107.5
1169	10/01/2015	107.4
1170	11/01/2015	106.6
1171	12/01/2015	105.9
1172	01/01/2016	106.8
1173		

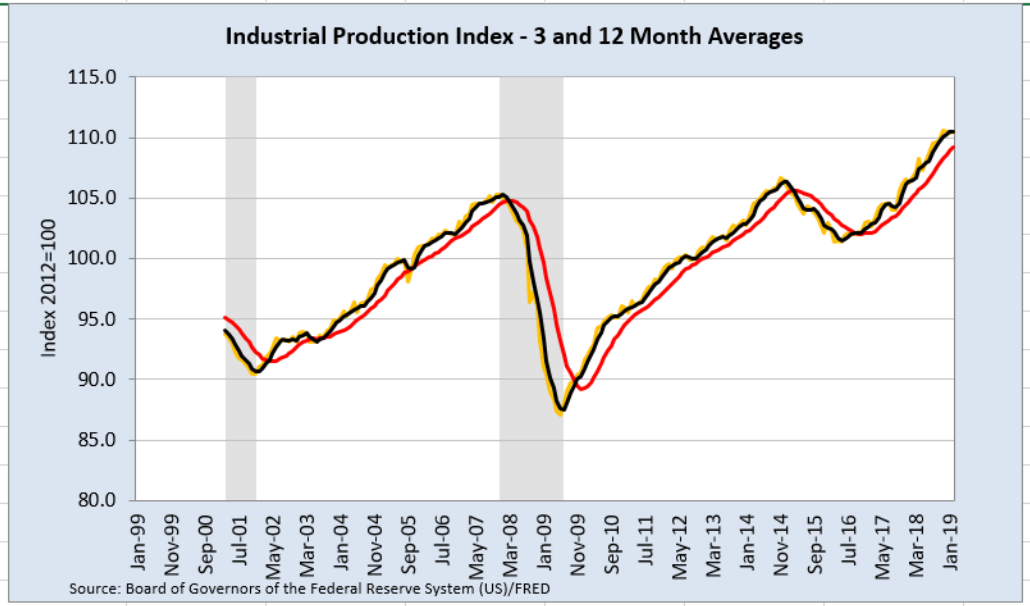
Sheet1

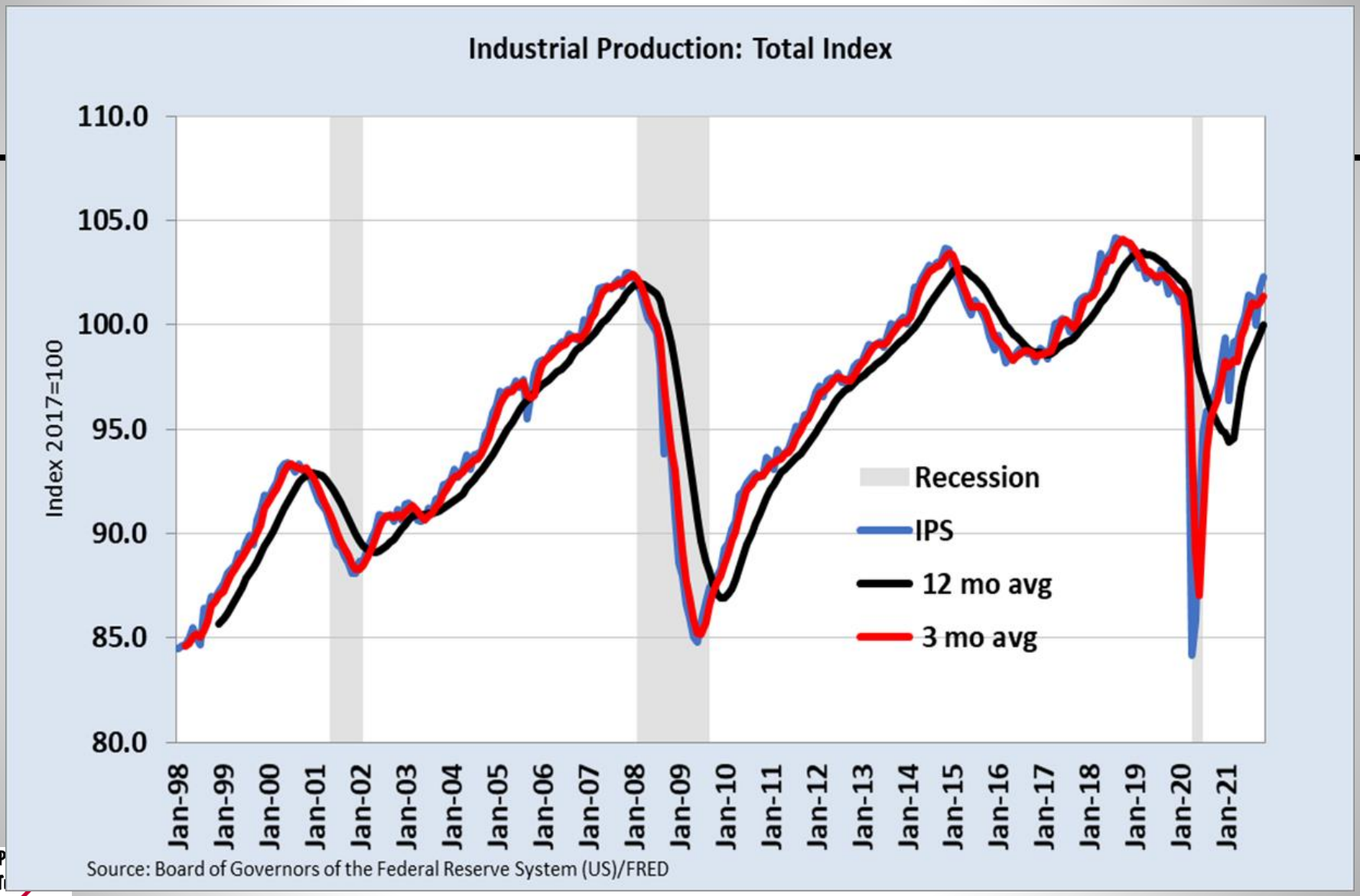
Create Graph Industrial Production Index Federal Reserve Bank of St. Louis

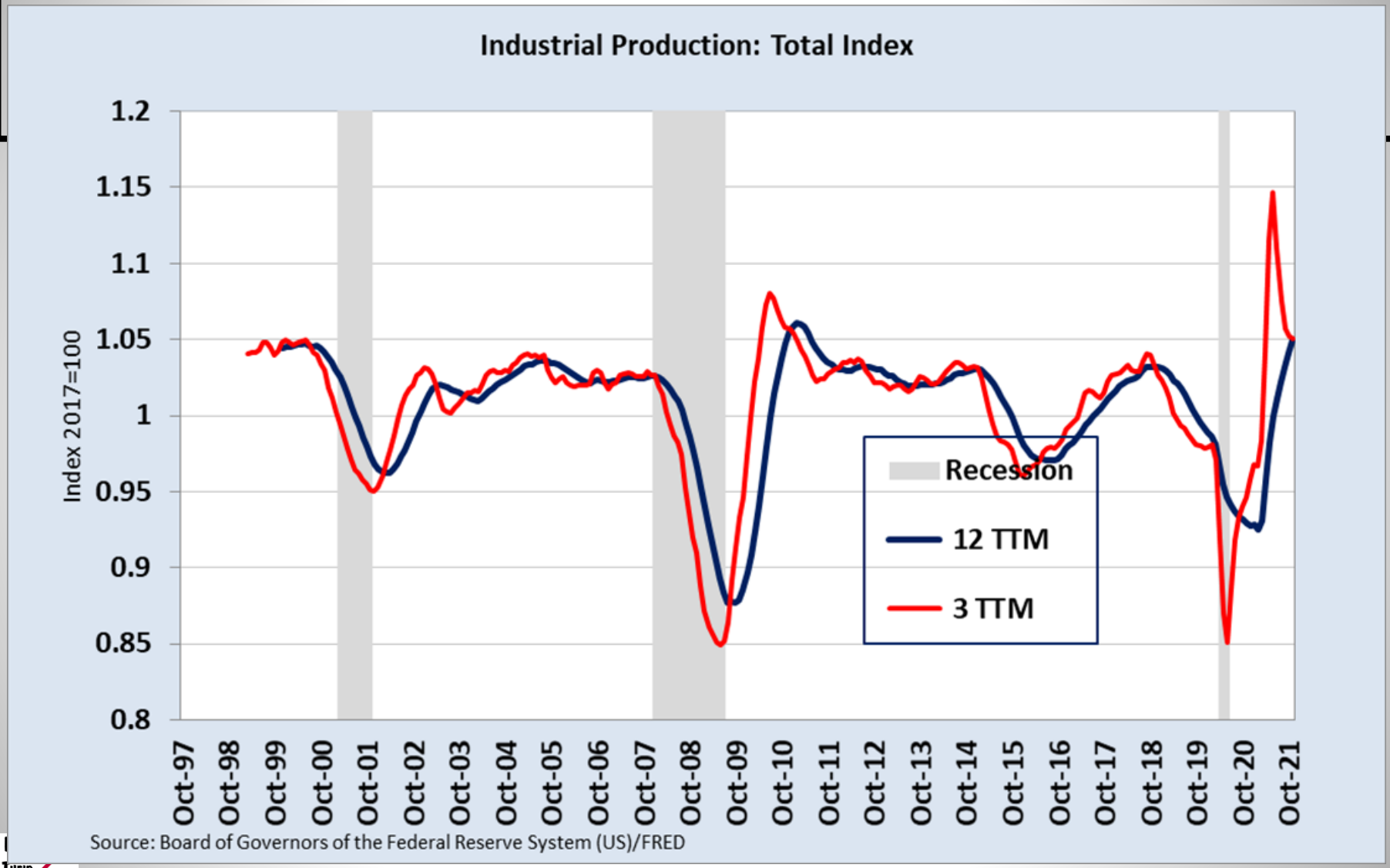


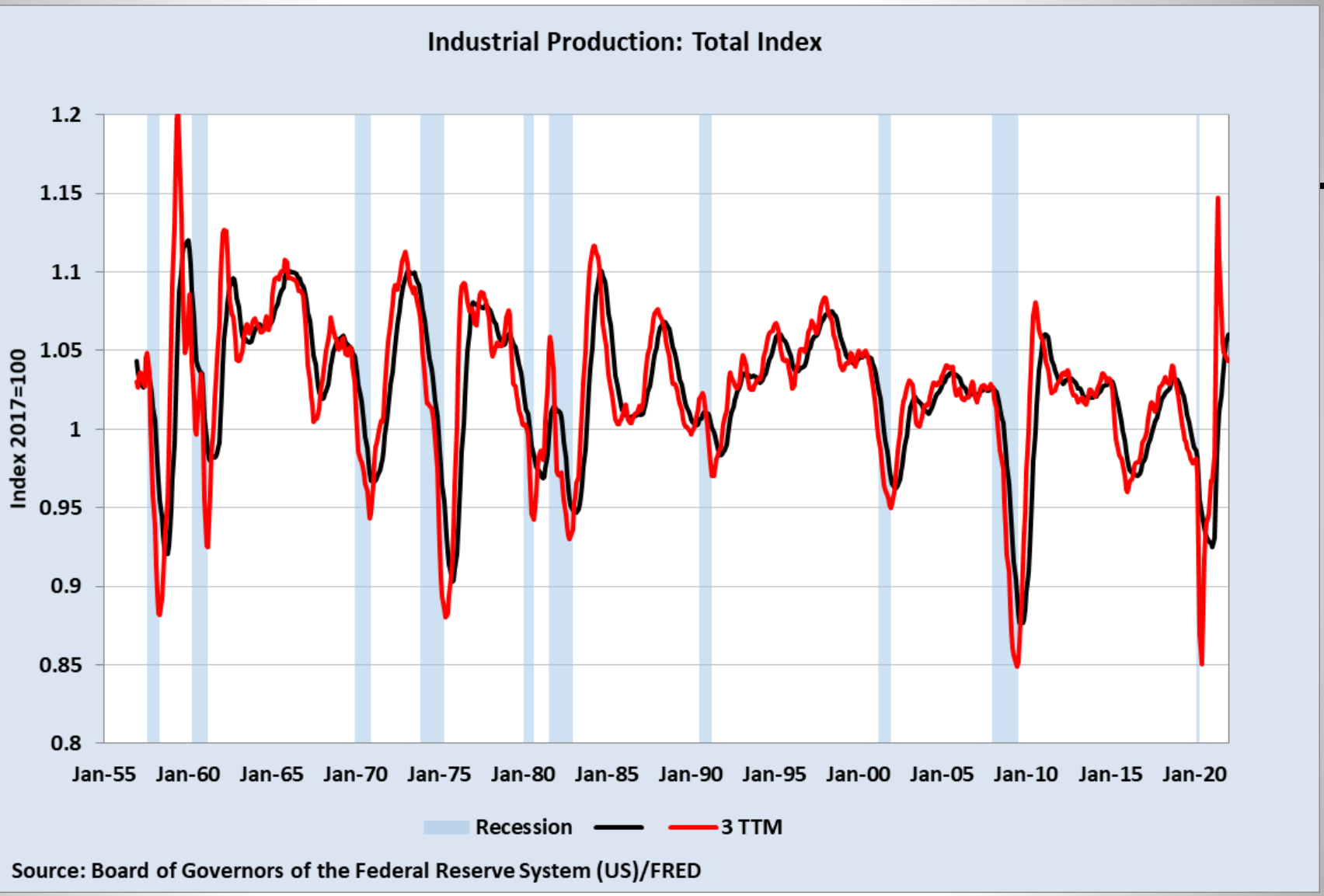
Build Graph Industrial Production Index Federal Reserve Bank of St. Louis (continued)

	A	B	C	D	E	F
1	INDPRO					
2	lin	Index 2012=100				
3	M	Monthly				
4	01/01/1999	1919-01-01 to 2019-02-01				
5	Industrial Production Index					
6	Board of Governors of the Federal Reserve System (US)					
7	date	value	3 mo avg	12 mo avg	3 TTM	12 TTM
34	03/01/2001	93.7	94.07	95.14	0.9957	1.0257
35	04/01/2001	93.4	93.70	94.97	0.9873	1.0195
36	05/01/2001	92.9	93.35	94.74	0.9794	1.0132
37	06/01/2001	92.3	92.88	94.45	0.9714	1.0060
38	07/01/2001	91.8	92.33	94.13	0.9652	0.9993
39	08/01/2001	91.7	91.93	93.83	0.9622	0.9933
40	09/01/2001	91.3	91.60	93.47	0.9589	0.9861
41	10/01/2001	90.9	91.31	93.10	0.9565	0.9801
42	11/01/2001	90.5	90.92	92.69	0.9520	0.9741
43	12/01/2001	90.5	90.64	92.30	0.9509	0.9691
44	01/01/2002	91.1	90.69	92.01	0.9542	0.9658
45	02/01/2002	91.1	90.88	91.77	0.9612	0.9637
46	03/01/2002	91.8	91.31	91.61	0.9707	0.9629
47	04/01/2002	92.2	91.68	91.50	0.9784	0.9635
48	05/01/2002	92.6	92.18	91.48	0.9875	0.9656
49	06/01/2002	93.4	92.73	91.57	0.9984	0.9695

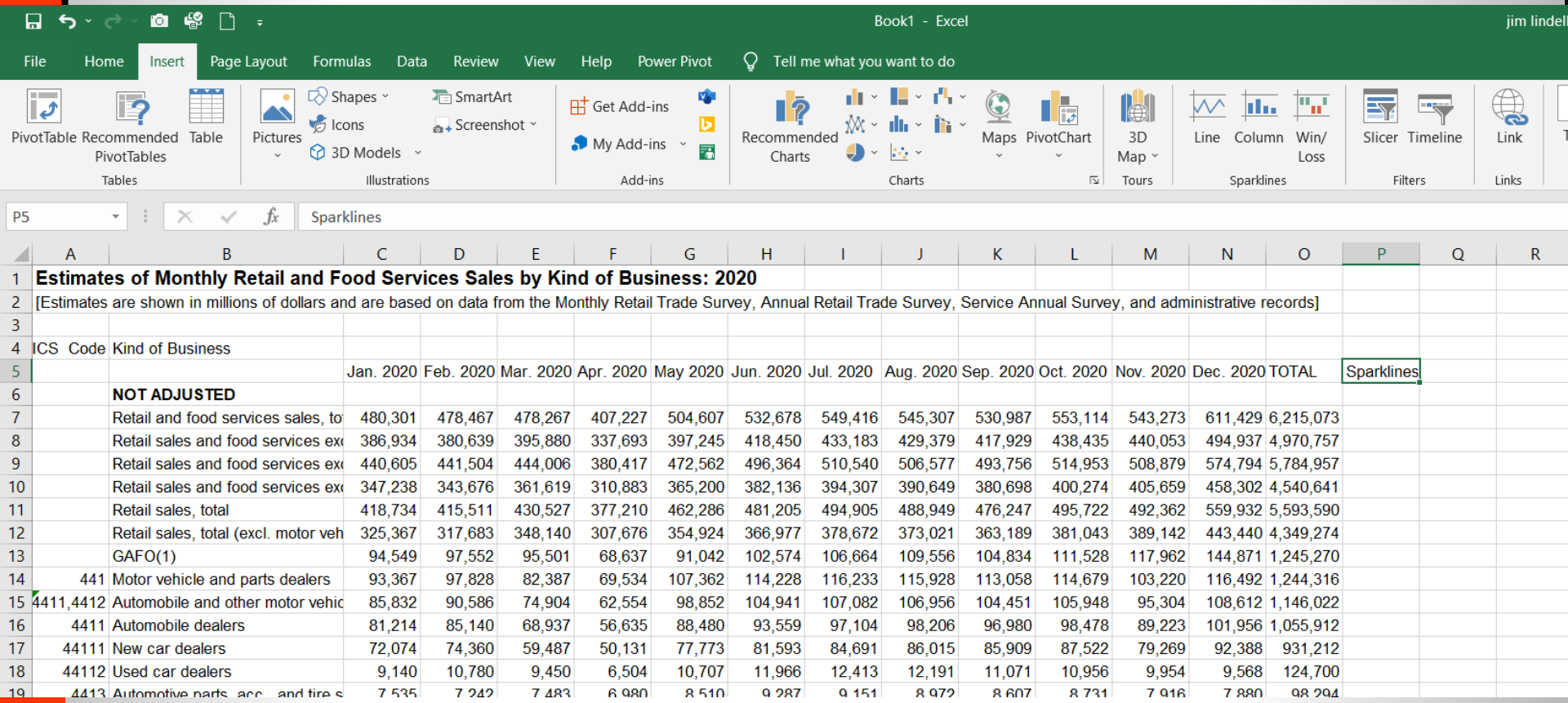



Industrial Production: Total Index
110.0
105.0
100.0
95.0
90.0
85.0
80.0
Index 2017=100
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Recession
IPS
12 mo avg
3 mo avg
Source: Board of Governors of the Federal Reserve System (US)/FRED


Industrial Production: Total Index
Index 2017=100
1.2
1.15
1.1
1.05
1
0.95
0.9
0.85
0.8
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Oct-06
Oct-07
Oct-08
Oct-09
Oct-10
Oct-11
Oct-12
Oct-13
Oct-14
Oct-15
Oct-16
Oct-17
Oct-18
Oct-19
Oct-20
Oct-21
Recession
12 TTM
3 TTM
Source: Board of Governors of the Federal Reserve System (US)/FRED



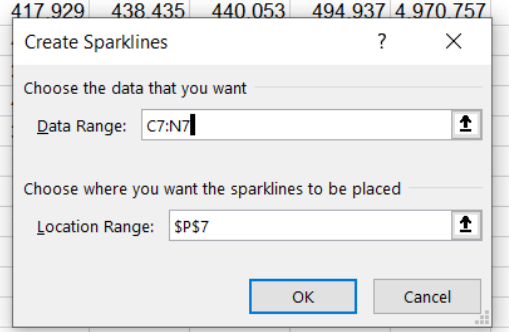
Sparklines



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**Estimates of Monthly Retail and Food Services Sales by Kind of Business: 2020**																	
2	[Estimates are shown in millions of dollars and are based on data from the Monthly Retail Trade Survey, Annual Retail Trade Survey, Service Annual Survey, and administrative records]																	
3																		
4	ICS Code	Kind of Business																
5			Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May 2020	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	TOTAL	Sparklines		
6		**NOT ADJUSTED**																
7		Retail and food services sales, to	480,301	478,467	478,267	407,227	504,607	532,678	549,416	545,307	530,987	553,114	543,273	611,429	6,215,073			
8		Retail sales and food services exc	386,934	380,639	395,880	337,693	397,245	418,450	433,183	429,379	417,929	438,435	440,053	494,937	4,970,757			
9		Retail sales and food services exc	440,605	441,504	444,006	380,417	472,562	496,364	510,540	506,577	493,756	514,953	508,879	574,794	5,784,957			
10		Retail sales and food services exc	347,238	343,676	361,619	310,883	365,200	382,136	394,307	390,649	380,698	400,274	405,659	458,302	4,540,641			
11		Retail sales, total	418,734	415,511	430,527	377,210	462,286	481,205	494,905	488,949	476,247	495,722	492,362	559,932	5,593,590			
12		Retail sales, total (excl. motor veh	325,367	317,683	348,140	307,676	354,924	366,977	378,672	373,021	363,189	381,043	389,142	443,440	4,349,274			
13		GAFO(1)	94,549	97,552	95,501	68,637	91,042	102,574	106,664	109,556	104,834	111,528	117,962	144,871	1,245,270			
14	441	Motor vehicle and parts dealers	93,367	97,828	82,387	69,534	107,362	114,228	116,233	115,928	113,058	114,679	103,220	116,492	1,244,316			
15	4411,4412	Automobile and other motor vehic	85,832	90,586	74,904	62,554	98,852	104,941	107,082	106,956	104,451	105,948	95,304	108,612	1,146,022			
16	4411	Automobile dealers	81,214	85,140	68,937	56,635	88,480	93,559	97,104	98,206	96,980	98,478	89,223	101,956	1,055,912			
17	44111	New car dealers	72,074	74,360	59,487	50,131	77,773	81,593	84,691	86,015	85,909	87,522	79,269	92,388	931,212			
18	44112	Used car dealers	9,140	10,780	9,450	6,504	10,707	11,966	12,413	12,191	11,071	10,956	9,954	9,568	124,700			
19	4413	Automotive parts, acc... and tire s	7,535	7,242	7,483	6,980	8,510	9,287	9,151	8,972	8,607	8,731	7,916	7,880	98,294			

Sparklines (cont.)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	**Estimates of Monthly Retail and Food Services Sales by Kind of Business: 2020**																
2	[Estimates are shown in millions of dollars and are based on data from the Monthly Retail Trade Survey, Annual Retail Trade Survey, Service Annual Survey, and administrative records]																
3																	
4	ICS Code	Kind of Business															
5			Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May 2020	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	TOTAL	Sparklines	
6		**NOT ADJUSTED**															
7		Retail and food services sales, to	480,301	478,467	478,267	407,227	504,607	532,678	549,416	545,307	530,987	553,114	543,273	611,429	6,215,073		
8		Retail sales and food services ex	386,934	380,639	395,880	337,693	397,245	418,450	433,183	429,379	417,929	438,435	440,053	494,937	4,970,757		
9		Retail sales and food services ex	440,605	441,504	444,006	380,417	472,562	496,364	510,540	506,577							
10		Retail sales and food services ex	347,238	343,676	361,619	310,883	365,200	382,136	394,307	390,649							
11		Retail sales, total	418,734	415,511	430,527	377,210	462,286	481,205	494,905	488,949							
12		Retail sales, total (excl. motor veh	325,367	317,683	348,140	307,676	354,924	366,977	378,672	373,021							
13		GAFO(1)	94,549	97,552	95,501	68,637	91,042	102,574	106,664	109,556							
14	441	Motor vehicle and parts dealers	93,367	97,828	82,387	69,534	107,362	114,228	116,233	115,928							
15	4411,4412	Automobile and other motor vehic	85,832	90,586	74,904	62,554	98,852	104,941	107,082	106,956							
16	4411	Automobile dealers	81,214	85,140	68,937	56,635	88,480	93,559	97,104	98,206							
17	44111	New car dealers	72,074	74,360	59,487	50,131	77,773	81,593	84,691	86,015							
18	44112	Used car dealers	9,140	10,780	9,450	6,504	10,707	11,966	12,413	12,191							
19	4413	Automotive parts, acc., and tire s	7,535	7,242	7,483	6,980	8,510	9,287	9,151	8,972	8,607	8,731	7,916	7,880	98,294		
20	442,443	Furniture, home furn, electronics	16,569	16,139	13,975	7,017	11,301	15,601	17,180	17,856	17,530	17,979	19,483	21,613	192,243		



Sparklines (cont.)

	C	D	E	F	G	H	I	J	K	L	M	N	O	P
5	Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May 2020	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020	TOTAL	Sparklines
6														
7	480,301	478,467	478,267	407,227	504,607	532,678	549,416	545,307	530,987	553,114	543,273	611,429	6,215,073	
8	386,934	380,639	395,880	337,693	397,245	418,450	433,183	429,379	417,929	438,435	440,053	494,937	4,970,757	
9	440,605	441,504	444,006	380,417	472,562	496,364	510,540	506,577	493,756	514,953	508,879	574,794	5,784,957	
10	347,238	343,676	361,619	310,883	365,200	382,136	394,307	390,649	380,698	400,274	405,659	458,302	4,540,641	
11	418,734	415,511	430,527	377,210	462,286	481,205	494,905	488,949	476,247	495,722	492,362	559,932	5,593,590	
12	325,367	317,683	348,140	307,676	354,924	366,977	378,672	373,021	363,189	381,043	389,142	443,440	4,349,274	
13	94,549	97,552	95,501	68,637	91,042	102,574	106,664	109,556	104,834	111,528	117,962	144,871	1,245,270	
14	93,367	97,828	82,387	69,534	107,362	114,228	116,233	115,928	113,058	114,679	103,220	116,492	1,244,316	
15	85,832	90,586	74,904	62,554	98,852	104,941	107,082	106,956	104,451	105,948	95,304	108,612	1,146,022	
16	81,214	85,140	68,937	56,635	88,480	93,559	97,104	98,206	96,980	98,478	89,223	101,956	1,055,912	
17	72,074	74,360	59,487	50,131	77,773	81,593	84,691	86,015	85,909	87,522	79,269	92,388	931,212	
18	9,140	10,780	9,450	6,504	10,707	11,966	12,413	12,191	11,071	10,956	9,954	9,568	124,700	
19	7,535	7,242	7,483	6,980	8,510	9,287	9,151	8,972	8,607	8,731	7,916	7,880	98,294	
20	16,569	16,139	13,975	7,017	11,301	15,601	17,180	17,856	17,530	17,979	19,483	21,613	192,243	
21	9,490	9,452	8,159	3,977	7,349	9,993	10,625	11,017	11,071	11,114	11,187	12,129	115,563	
22	5,148	5,287	4,499	2,004	4,259	5,730	5,957	5,847	6,112	6,053	5,894	6,153	62,943	

SIMFIN – Public Companies 18K lines

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Company	Ticker	SimFinId	Currency	Fiscal Year	Fiscal Period	Report Date	Publish Date	Restated Date	Shares (Basic)	Shares (Diluted)	Revenue	Cost of Revenue	Gross Profit	Operating Expenses	Selling, General & Administrative	Research & Development	Depreciation & Amortization	Operating Income (Loss)
2																			
3	Agilent Technolo	A	45846	USD	2008	FY	10/31/2008	12/19/2008	12/20/2010	363000000	371000000	5774000000	-2578000000	3196000000	-2401000000	-1697000000	-704000000		795000000
4	Agilent Technolo	A	45846	USD	2009	FY	10/31/2009	12/21/2009	12/16/2011	346000000	346000000	4481000000	-2189000000	2292000000	-2245000000	-1603000000	-642000000		47000000
5	Agilent Technolo	A	45846	USD	2010	FY	10/31/2010	12/20/2010	12/20/2012	347000000	353000000	5444000000	-2514000000	2930000000	-2364000000	-1752000000	-612000000		566000000
6	Agilent Technolo	A	45846	USD	2011	FY	10/31/2011	12/16/2011	12/19/2013	347000000	355000000	6615000000	-3086000000	3529000000	-2458000000	-1809000000	-649000000		1071000000
7	Agilent Technolo	A	45846	USD	2012	FY	10/31/2012	12/20/2012	12/22/2014	348000000	353000000	6858000000	-3254000000	3604000000	-2485000000	-1817000000	-668000000		1119000000
8	Agilent Technolo	A	45846	USD	2013	FY	10/31/2013	12/19/2013	12/21/2015	341000000	345000000	3894000000	-1987000000	1907000000	-1521000000	-1184000000	-337000000		386000000
9	Agilent Technolo	A	45846	USD	2014	FY	10/31/2014	12/22/2014	12/20/2016	333000000	338000000	4048000000	-2072000000	1976000000	-1557000000	-1199000000	-358000000		419000000
10	Agilent Technolo	A	45846	USD	2015	FY	10/31/2015	12/21/2015	12/21/2017	333000000	335000000	4038000000	-1997000000	2041000000	-1519000000	-1189000000	-330000000		522000000
11	Agilent Technolo	A	45846	USD	2016	FY	10/31/2016	12/20/2016	12/20/2018	326000000	329000000	4202000000	-2005000000	2197000000	-1582000000	-1253000000	-329000000		615000000
12	Agilent Technolo	A	45846	USD	2017	FY	10/31/2017	12/21/2017	12/20/2018	322000000	326000000	4472000000	-2063000000	2409000000	-1568000000	-1229000000	-339000000		841000000
13	Agilent Technolo	A	45846	USD	2018	FY	10/31/2018	12/20/2018	12/20/2018	321000000	325000000	4914000000	-2227000000	2687000000	-1759000000	-1374000000	-385000000		928000000
14	Agilent Technolo	A	45846	USD	2019	FY	10/31/2019	12/19/2019	12/19/2019	314000000	318000000	5163000000	-2358000000	2805000000	-1864000000	-1460000000	-404000000		941000000
15	Alcoa	AA	367153	USD	2015	FY	12/31/2015	3/2/2016	3/15/2017	182471195	182000000	11199000000	-9039000000	2160000000	-1202000000	-353000000	-69000000	-780000000	958000000
16	Alcoa	AA	367153	USD	2016	FY	12/31/2016	2/3/2017	3/15/2017	183000000	183000000	9318000000	-7898000000	1420000000	-1110000000	-359000000	-33000000	-718000000	310000000
17	Alcoa	AA	367153	USD	2017	FY	12/31/2017	2/26/2018	2/26/2018	184000000	187000000	11652000000	-9072000000	2580000000	-1066000000	-284000000	-32000000	-750000000	1514000000
18	Alcoa	AA	367153	USD	2018	FY	12/31/2018	2/26/2019	2/26/2019	186000000	189000000	13403000000	-10081000000	3322000000	-1012000000	-248000000	-31000000	-733000000	2310000000
19	Alcoa	AA	367153	USD	2019	FY	12/31/2019	2/21/2020	2/21/2020	185000000	185000000	10433000000	-8537000000	1896000000	-1020000000	-280000000	-27000000	-713000000	876000000

Key Financials & Ratios	
Revenues (in million USD, TTM)	1,697
Gross Profit (in million USD, TTM)	243
Operating Income (in million USD, TTM)	-137
Net Profit (in million USD, TTM)	-212
Cash and Cash Equivalents (in million USD, TTM)	44
Receivables (in million USD, TTM)	236
Total Current Assets (in million USD, TTM)	844
PP&E (in million USD, TTM)	390
Total Assets (in million USD, TTM)	1,589
Accounts Payable (in million USD, TTM)	192
Current Debt (in million USD, TTM)	609
Total Current Liabilities (in million USD, TTM)	930
Long-Term Debt (in million USD, TTM)	90
Total Liabilities (in million USD, TTM)	1,350
Total Equity (in million USD, TTM)	239
Gross Margin (TTM)	14.3%
Operating Margin (TTM)	-8.1%
Net Profit Margin (TTM)	-12.5%
Return on Equity (TTM)	-88.6%
Return on Assets (TTM)	-13.3%
Basic EPS (TTM)	-5.09
Diluted EPS (TTM)	-5.09
Sales per Share (TTM)	40.76
Book Value per Share (TTM)	5.75
Price to Earnings Ratio (TTM)	-.15
Price to Sales Ratio (TTM)	.02
Price to Book Value (TTM)	.14
EV/Sales (TTM)	.41
Book to Market Value (TTM)	7.23
Current Ratio (TTM)	90.7%
Liabilities to Equity Ratio (TTM)	564.1%
Debt to Assets Ratio (TTM)	44.0%

Carnival Cruise Lines

Cruise Line Uses Big Data to Optimize Prices

- Carnival Cruises wanted to segment its customer base to better understand its spending patterns. Carnival's goals were to learn the following:

  - How to attract new customers
  - How to re-price tickets to fill more staterooms
  - Understanding customer's spending habits on souvenirs, excursions, and extras.

- The company used data scientists to analyze data, economic trends, and social trends from past customers and vacationers in general.

- One objective was to match clients with the most appropriate cruise ship in its fleet of 100 ships—nine brands from budget family to luxury cruises. Differentiation of customers in terms of services and related price ranges could be significant.

- Kim Nash, "Carnival Strategy Chief Bets That Big Data Will Optimize Prices," The CIO Report, *The Wall Street Journal,* accessed March 21, 2016, http://blogs.wsj.com/cio/2015/04/30/carnival-strategy-chief-bets-that-big-data-will-optimize-prices/

Cruise Line Uses Big Data to Optimize Prices

- Overall profitability of the cruise is dependent on the entire cruise, the company must be able to monitor and adjust strategies that can have a daily impact. Prices may not change dynamically, but the daily results may alter strategies and promotions.
- The primary metric is available passenger cruise days (the number of days customers are aboard ship.) According to the CEO, the total available days over the fleet is 80 million in a year. In simple terms, if every passenger spent $1 more per day during his or her trip, Carnival would add $80 million in revenue over the course of one year.
- The data science team at Carnival works daily, analyzing data such as passenger behavior, vacation trends, and questions from travel agents and queries from customers. The analysis runs overnight and develops thousands of recommendations for changes to ticket prices around the world. Carnival understands that analytics does not mean that they are making the correct decision—only a better-informed decision. Management still relies on their human experience in addition to analytics.

- Kim Nash, "Carnival Strategy Chief Bets That Big Data Will Optimize Prices," The CIO Report, *The Wall Street Journal,* accessed March 21, 2016, http://blogs.wsj.com/cio/2015/04/30/carnival-strategy-chief-bets-that-big-data-will-optimize-prices/

Carnival – Analyst, BI
Job Description

- We are currently seeking an Analyst, Business Intelligence! The primary responsibility of the Analyst, Business Intelligence is to (1) Provide data analysis to drive business decisions aimed at meeting departmental and organizational objectives. (2) Support the organization to make data-driven business decisions (3) Collaborate with other team members to maintain, develop, execute, and analyze targeted offers and database marketing campaigns. (4) Generate insights and testing methodologies based on consumer behavior and campaign performance. (5) Develop Business Intelligence visualizations, dashboards and solutions to optimize and automate daily, weekly and monthly delivery of reports. (6) Use state-of-the-art technologies and advanced analytics to implement predictive models and decision engines to drive email and web personalization and targeted offers. (7) Collaborate with IT to design data sources that meet reporting and analytical needs of business teams.

As of April 27, 2022

Essential Functions

- Data Analysis, Reports and Dashboards: Work with business teams to review processes and develop data and reporting requirements. Develop queries and analyze data sets. Develop dashboards, reports and prepare presentations of analysis, insights, trends, metrics and results for management and senior leadership. Support business users in developing reports, tools and automation.
- Database Marketing, Advanced Analytics and Automated Solutions: Develop automated solutions to collect guest and transactional data from diverse set of sources. Perform data visualization to explore trends and relationships in data. Design, develop, automate, maintain and enhance predictive models to prioritize guests for targeted offers and to personalize emails and web experience. Develop code to generate lists of scored guests for targeted offers, prioritized call lists and database marketing campaigns. Analyze campaign response rates and adjust code for future campaigns.

Minimum Qualifications

- A Bachelor's Degree in Information Systems, Computer Science, Business Administration, Mathematics or Statistics.
- 2+ years of experience working in the Business Intelligence, Analytics and Data Science area or equivalent coursework.
- 2+ years of developer experience with a BI tool or equivalent coursework. 1+ years of experience with SQL and Databases or equivalent coursework. Experience with SAS Discover, Tableau, SAS, SSRS, Enterprise Miner, R, Python, Google Analytics, Hadoop is a plus.
- Strong analytical and problem solving skills, written and verbal communication skills. Ability to clearly understand business processes, drivers and KPIs. Clear understanding of BI and Data Warehousing concepts. Clear understanding of dimensional data models and SQL, systems integration and automation.

https://jobs.carnivalcorp.com › job › miami › manager-sr-data-and-analytics-business-intelligenc...

Business Intelligence - Working at CARNIVAL CRUISE LINE

Mar 29, 2022 · 8+ years of experience with data analytics and **business intelligence**, driving process improvements, overseeing data mining and reporting activities, and managing projects and a team. ... **Carnival Cruise** Line is the most popular **cruise** brand in North America and operates a fleet of ships designed to foster exceptionally safe, fun and memorable ...

https://www.compeete.com › i › business-competitive-intelligence › about › org-company › carni...

Carnival Cruise Line Market Intelligence | Compeete | Business & Mar...

Carnival Cruise Line has made sizeable number of venture capital investments. **Carnival Cruise** Line's primary area of focus is Computer Security, Travel, Ransomware, Data Breach, Airline & Footwear. **Carnival Cruise** Line's primarily competes with Mastercard, Visa Inc, Square Inc, Jpmorgan Chase, Paypal & Bank of America.

https://jobs.carnivalcorp.com › job › santa-clarita › business-intelligence-architect › 8858 › 12511...

Business Intelligence Architect at CARNIVAL CRUISE LINE

May 21, 2021 · Princess **Cruises**, Holland America Line, Seabourn and P&O **Cruises** Australia, united as Holland America Group, offering world-renown vacations at sea to travelers around the globe, are building a dynamic, unified organization to serve its highly experienced teams in both our corporate offices and on board our ships.

https://www.linkedin.com › jobs › view › analyst-business-intelligence-at-carnival-cruise-line-304...

Carnival Cruise Line hiring Analyst, Business Intelligence in Miami ...

Carnival Cruise Line is the most popular **cruise** brand in North America and operates a fleet of ships designed to foster exceptionally safe, fun and memorable vacation experiences at an outstanding ...

Senior Manager, Business Analytics Holland Cruise Line - Job Description

- We're looking for an amazing business intelligence professional to fill this role, which is based in our Seattle office. You'll be responsible for providing leadership, direction, and coordination to company and team resources that supports Revenue, Sales, Data Science, Deployment Planning, and Operations Support for both Holland America & Seabourn. You will use your skills to conceive and develop new opportunities to optimize revenue and enhance understanding and decision making within our business. You will work closely with business end users to develop business analytical tools and dashboards. In addition, you will liaison with IT to develop and implement our BI roadmap as we look to move our data warehouse from Oracle to Snowflake to bring all of our data sources together and have the horsepower with the right tools available to leverage it. You will also be responsible for the timely and accurate operations of all commercial and executive reporting in additional to interacting with company leadership to provide Ad Hoc analysis and summaries as required.

Responsibilities

- Design and create reports, ad-hoc, and dashboards that drive revenue maximization using SQL to data model views & tables for company BI platforms and reporting.
- Perform deep data dives from multiple data sources; analyze data and report opportunities and recommendations to management
- Provide leadership, direction, and coordination to company and team resources in support of medium to small corporate IT/Business initiatives.
- Lead architecture design and selection of IT solutions in support of Business/Data Science as well as other projects as assigned; Supervise and drive IT development and data provisioning, guiding infrastructure and other supporting teams towards delivery

Responsibilities

- Responsible for requirements definition and functional application design, including user stories, use cases, and business requirements documents and translating requirements into IT projects.
- Provide leadership, direction, and coordination to company and team resources in support of medium to small corporate IT/Business initiatives.
- Participates in IT design reviews and provides suggestions to improve usability, adoption and customer value, Develop specs and design requirements for improving existing data or adding new functionality to data warehouse.
- Ensure timely operations and high-quality standards of all department reporting
- Ability to communicate and translate information between technical and non-technical audiences
- Analyze existing customer needs and work with product owners and development teams to implement high value features and solutions.
- Provides leadership to IT/ Business team members.
- Manages and prioritizes the IT backlog, JIRA SCRUM Process, and available resources.

Requirements

- Master's Degree in Computer Sciences, Data Science, Operations Research, Engineering, Applied Mathematics, Applied Statistics or related field
- 7 - 10 years practical experience working with both technical and non-technical business users delivering analytical tools.
- ORACLE, Snowflake, SQL, MySQL, Tableau, Power BI, Power Pivot, SSRS R, Python, or C++
- Knowledge of managing complex databases or building financial models
- Ability to communicate and translate information between technical and non-technical audiences and confidently translate business problems into model insights and enhancements
- Preferred Relevant work experience supporting revenue management, pricing automation systems, or user support functions for large software company
- Strong analytical capabilities with a high level of attention to detail
- Creative and innovative detail focused problem-solver
- Ability to work both independently and collaboratively

Target and the Danger of Predictive Analytics

- Target was able to use Big Data on customer information and then use predictive analytics to predict the likelihood of pregnancy. How had Target obtained information from customers without spying on them and how do you take advantage of that information?
- Target hired Andrew Pole as a statistician in 2002. Pole had a Master's Degree in Statistics and another in Economics. Staff from Target's marketing department approached Pole and asked him if he could determine if a customer was expecting a baby. If this could be achieved, Target could market to the [2] Duhigg, Charles. "How Companies Learn Your Secrets - The New York Times." Accessed June 16, 2015. www.nytimes.com/2012/02/19/magazine/shopping-habits.html?pagewanted=all&_r=0. customer prior to the birth and hopefully garner a larger portion of "future spending" related to the baby needs.
- What type of data does Target acquire on its customers? When the opportunity arises, Target assigns each shopper a unique code—known internally as the guest ID number—that keeps tabs on everything purchased.
- The following are linked to the guest ID:
  - Use of credit card
  - Use of a coupon
  - Completion of a survey
  - Mailed in a refund
  - Call to the customer help line
  - Opened an email
  - Visited Target website

Target (cont.)

- The following additional demographic information is also linked to guest ID: Age, marital status, children, address, driving time to store, your estimated salary, recent relocation history, your credit cards, and websites you visit.
- In addition Target can buy additional data such as ethnicity, job history, the magazines you read, bankruptcy history, marital (divorce) history, the year you bought (or lost) your house, your college, online topics you participate in, preferred coffee brands, type of paper towels, cereal or applesauce, your political perspectives, reading habits, charitable giving, and the vehicles that you have.
- To appreciate the relationship between predictive analytics and buying habits, Drugghi highlighted some foundational research conducted in the 1980s by a team of researchers led by UCLA professor, Alan Andreasen. The research studied purchases such as soap, toothpaste, trash bags, and toilet paper. Most shoppers paid little attention to how they bought these products. These were habitual purchases and did not involve any complex decision-making.
- The researchers found that when some customers were going through a major life event like graduation, a new job, moving, or the like, shopping habits became flexible and predictable. If the habits were predictable, the retailers could capitalize on this knowledge. They also discovered that newlyweds changed coffee brands. The purchase of a new house results in new breakfast cereal choices and finally, divorce results in buying different brands of beer. Therefore, shopping habits would also be expected to change for a mother expecting a child.

Target (cont.)

- Target had traditional indicators of motherhood such as a baby-shower registry which became a source of data for Pole. Pole's colleagues noticed some of the following correlations:

  - Women who had registered began purchasing larger quantities of unscented lotion at the beginning of their second trimester.
  - During the first 20 weeks, pregnant women loaded up on supplements like calcium, magnesium, and zinc.
  - Increased purchased quantities of scent-free soap, extra-big bags of cotton balls, hand sanitizers, and washcloths are signals of an approaching delivery date.

Pole's research identified about 25 products that, when analyzed together, enabled the ability to assign each shopper a "pregnancy prediction" score. He could also estimate the due date so Target could send coupons timed to very specific stages of her pregnancy.

Target (cont.)

- Pole applied the ”pregnancy prediction” score to every regular female shopper in Target’s national database and created a list of tens of thousands of women who were most likely pregnant. These shoppers could now be targeted for specific marketing programs.
- Supposedly, about a year after the pregnancy-prediction model was created, an irate man walked into a Minneapolis Target to see the manager. He was angry that his daughter received coupons that an expectant mother would receive and wondered if the store was encouraging teenage pregnancy (his daughter was still in high school.)
- The manager apologized and then called a few days later to apologize again. On the phone, though, the father was somewhat abashed. “I had a talk with my daughter,” he said. “It turns out there has been some activities in my house I haven’t been completely aware of. She’s due in August. I owe you an apology.”
- Exercise: What is the implication of companies gathering data on customers, making predictive analytics and then sending advertising material based on the marketing data?
- The Incredible Story of How Target Exposed A Teen Girl’s Pregnancy, www.businessinsider.com/the-incredible-story-of-how-target-exposed-a-teen-girls-pregnancy-2012- (accessed June 17, 2015).

Amazon

- Every time a user searches for a specific product, this data helps the platform to guess what else the user can have interest in. This in turn allows Amazon to enhance their procedure of convincing the consumer into purchasing it.
- Amazon also keeps track of what items were viewed, the shipping address of the users and the reviews left by the user.
- Big Data enables the warehouse nearest to the user to be chosen, reducing the shipping expenses considerably.
- Alexa – voice

Amazon (cont.)

- Behavioral analytics. It analyzes the purchasing patterns of the customers from the previously purchased items, items in the shopping cart or on their Wishlist, the products reviewed and rated by them, to most searched products.
- This information is then used to recommend additional products that other customers purchased when buying those same items. For example, if a customer adds a mobile phone to its shopping cart, mobile cases are recommended for purchase.
- One-Click ordering is a patented feature that is automatically enabled when a person places its first order and enters a shipping address and a payment method. If someone chooses One-Click ordering, he/she has 30 minutes to decide on the purchase. After that, the product is automatically charged via the added payment method and shipped to the added address.
- Anticipatory Shipping Model

Next Steps

- Accountant Role morphing
- Story is in the data
- Download FRED and test it out
- Download MS BI and test it out
- Assess your skills

Reorienting accounting to a future-looking role

- Increase forecasting role
- Seek out industry trends on a regular basis
- Use historical data in novel ways
- Become an invaluable asset to the decision-making process
- Harness predictive analytics

Questions?
More Information?

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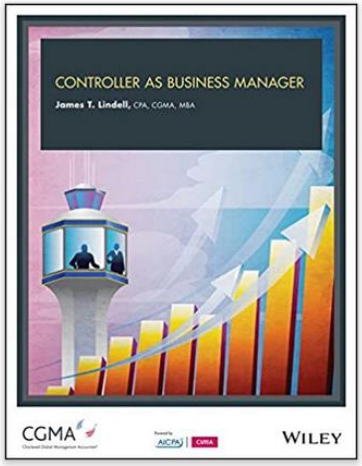

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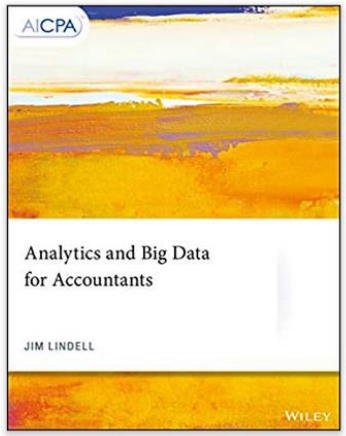

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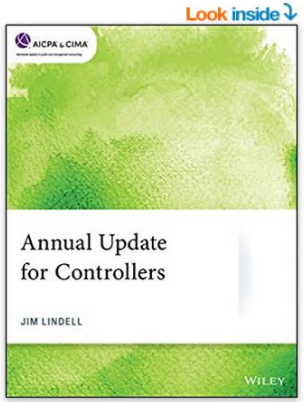

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