Data-Inspired Decision Making

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Data-Driven Decision Making
L> data is used to arrive at a decision
L> limited by quantity and quality of readily-available data
L> limited by overreliance, tendency to ignore insights, biases
L> e.g. splitting up website visiting to new/old to compare success

Data-Inspired Decision making
L> explores different data sources to find out
    what they have in common
L> like data-driven but adding another layer of complexity
L> considering a broader range of ideas
L> drawing comparisons, giving weight to feelings and experiences
L> avoid some pitfalls that data-driven decisions might be prone to
L> e.g. not just relying on 1-10 user experiences, but also asking the
    support centre representatives and adding their opinions

Algorithm
L> a process or set of rules to be followed for a specific task

"Most data is meaningless until someone adds a narrative to it"

Limitations
L> sometimes not access to all data
L> sometimes limited access to data

Key Takeaways

As a data analyst, you'll rarely need to consider, "Am I being data-driven or data-inspired?" It's helpful to have some context for these two approaches, though your own skills and knowledge will be the most important parts of any analysis project. So, keep a data-driven mindset and ask lots of questions. Experiment with many different possibilities. And use both logic and creativity along the way. Using this approach, you'll be prepared to interpret your data with the highest levels of care and accuracy.

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Quantity/Quality

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Data Analysts are going to be using both:

Quantitative data
L> specific and objective measures of numerical facts
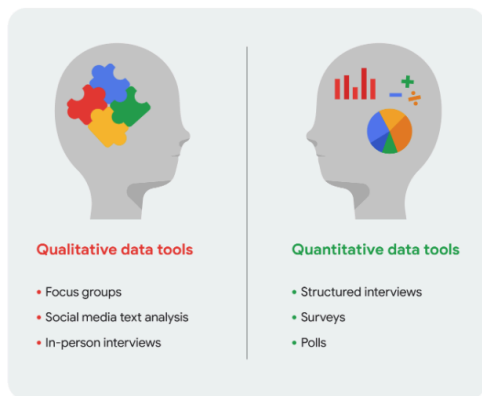L> the what / how many / how often
L> charts/graphs

Qualitative data
L> subjective or explanatory measures of qualities
    and characteristics
L> can't be measured
L> great for "why" questions
L> why numbers are the way they are
L> adding context to the data

Often starting with measurable questions (Quantitative):
L> How many negative reviews are there?
L> What's the average rating?
L> How many of these reviews use the same keyword?

These questions might lead to further questions
(Qualitative):
L> Why are customers unsatisfied?
L> How can we improve their experience

Qualitative data tools

• Focus groups
• Social media text analysis
• In-person interviews

Quantitative data tools

• Structured interviews
• Surveys
• Polls

End

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Reports vs Dashboards

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2 Representation Tools
L> for data visualisation

Reports
L> static collection of data given to stakeholders periodically
L> organised and easy reference
+ high-level historical data
+ easy to design and use
+ pre-cleaned and sorted data *(doesn't change once created)*
- visually not appealing
- requires continual maintenance for working
- static

Dashboards
L> monitors live, incoming data
L> more access to information being reported
+ dynamic, automatic *(dynamic = long-term value)*
+ interactive *(by playing with filters)*
+ more stakeholder access *(once more access - the better option)*
+ low maintenance *(can be a big time safer)*
- labour-intensive design *(if not used often - bad; if breaks - bad)*
- can be confusing *(overwhelm people with information)*
- potentially uncleaned data

E.G. Company wants to see its social media engagements
+ report that is checking on the social media platforms frequently?
+ or a dashboard that updates data automatically?

Pivot table
L> data summarisation tool
L> used in data processing
L> summarise, sort, reorganise, group, count
   total or average data stored in a data base
L> e.g. spreadsheet with many orders
L> Pivot Table can easily create new report,
   that shows people and their spendings,
   completely new sorted

End

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Data vs Metric

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Metric
L> single, quantifiable type of data that can be used for measurement
L> data starts as a collection of raw facts until we organise them
    into individual metrics that represent a single type of data
L> example before with pivot table
    L> data had no meaning before we used a specific metric
      to organise it
L> involve simple maths

<u>Revenue</u>
L> a metric
L> # of sales [multiplied] the sales price

<u>ROI</u>
L> another metric
L> Return on Investment
L> how well an investment is doing
L> NET profit over time / cost of investment

<u>Customer Retention Rates</u>
L> know how successful marketing strategies are
L> if new approaches to bring back customers necessary

Metric Goal
L> measurable goal set by a company and evaluated using metrics
L> e.g. reaching a certain number of sales
L> e.g. reaching a certain percentage of repeat customers

End

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Spreadsheets & Tableaus

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Spreadsheets
+ creating static charts and graphs
+ basic and simple data visualisation
+ clean, sort and filter data
+ range of chart types, graphing tools, pivot tables
+ easy to manage
+ compatibility with other apps like docs and slides

Tableau
+ powerful and interactive visualisations
+ excellent for live dashboards
+ drag-and-drop interface possible
+ wide range of data sources
+ advanced analytics capabilities
+ good for huge datasets
+ takes quite some time to learn and use effectively

Key Takeaways
 Although Tableau ultimately has more power than a basic
spreadsheet application, it's most often used for specific cases
and to work with large datasets. Don't underestimate how
much you can do with spreadsheets or how powerful
interconnectivity between apps can be!

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Dashboards

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Dashboard Definition
+ single point of access for managing a business' information

Dashboards Information
+ powerful visual tools
+ help to tell a story
+ monitors live, incoming data
+ uses multiple datasets
+ huge time savings
+ if data structure changes, dashboards need updates

Benefits	For data analysts	For stakeholders
Centralization	Share a single source of data with all stakeholders	Work with a comprehensive view of data, initiatives, objectives, projects, processes, and more
Visualization	Show and update live, incoming data in real time*	Spot changing trends and patterns more quickly
Insightfulness	Pull relevant information from different datasets	Understand the story behind the numbers to keep track of goals and make data-driven decisions
Customization	Create custom views dedicated to a specific person, project, or presentation of the data	Drill down to more specific areas of specialized interest or concern

Tableau
+ can create dashboards

How to create a dashboard
01 ask effective questions - identify needs and usage
     L> use the *"Dashboard Requirements Gathering Worksheet"*
02 design the dashboard *(what should be displayed)*
     L> clear header, short text description to each visualisation
     L> most important information on top
03 create mock-ups *(if desired)*
     L> simple draft for planning and evaluating *(sketch)*
04 select visualisation
     L> many options like line charts, bar graphs, etc.
05 create filters as needed
     L> show certain data while hiding the rest of the data

Dashboard Requirement Gathering Worksheet

Questions to Ask Users

1. How do you hope data will help you?

2. What questions are you trying to answer with the data? In other words, what problem are you trying to solve?

3. What are the three most important metrics that you care about?

4. How are these metrics defined or calculated?

5. Will you need to limit the data you see (for example, will you need to only look at results from a specific region or a specific time frame)? How so?

6. Are all the data sources you need to answer your questions currently available?

7. Are there any reports you use today that could be provided as examples of what would be useful? If so, please provide them.

8. If you had all this information in front of you, would you have enough information to take action? What action would you take? Would you need to know anything else?

Business Requirements Summary

Use this section to summarize your findings from
Hover over the text fields for additional context.

Who?
Who is the target audience

Primary Business Owner:

Primary Technical Owner:

What is the pain point this dashboard aims to ad

What requirements have been expressed for this

What actions are the users trying to take based o

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know anything else?

What actions are the users trying to take based o

Use this space to take additional notes on business requirements, if desired.

Technical Requirements Summa

What?

Do you have examples of ex
replicated?

Do you have product specif
metrics you need?

Will having this data in Loo

Is the data needed for this dashboard readily avai

Which data sources correlate to this dashboard?

Where does this data live?

What is the delivery method for this data?

Who?

Who should have access to this data?

Who should **not** have access to this data?

Use this space to take additional notes on technical requirements, if desired.

3 Dashboard Categories

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Strategic Dashboards
+ focus on long term goals and strategies
+ at highest level of metrics
+ evaluating/aligning strategic goals
+ from single quarter to years
+ useful for enterprise-wide decision-making

Revenue and Customer Overview – Q1
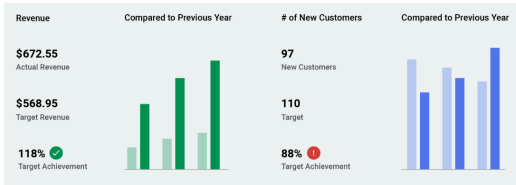
Operational Dashboards
+ short-term performance tracking and intermediate goals
+ most common type of dashboard
+ contain information on a time scale of days, weeks or months
+ provide performance insights almost in real-time
+ track and maintain immediate operational processes

Customer Service Team Dashboard
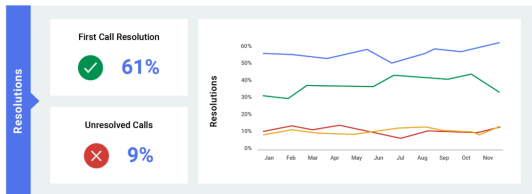
Analytical Dashboards
+ consists of the datasets and the mathematics used in these sets
+ vast amount of data used by data analysts
+ details involved in usage, analysis and predictions *(data scientists)*
+ data science teams - rarely shared with upper management

Financial Performance Dashboard
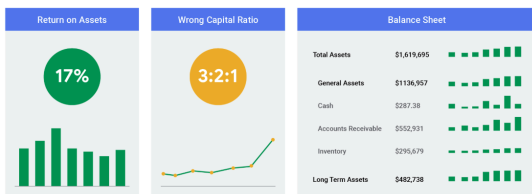
Consider the different types of dashboards: How are the different types of dashboards similar to each other? In what ways do they differ? Write 2-3 sentences (40-60 words) in response to each of these questions. Enter your response in the text box below.

A few commonalities in these examples include: Dashboards are visualizations: Visualizing data can be enormously useful for understanding and demonstrating what the data really means. Dashboards identify metrics: Relevant metrics may help analysts assess company performance. Some differences include the timeframe described in each dashboard. The operational dashboard has a timeframe of days and weeks, while the strategic dashboard displays the entire year. The analytic dashboard skips a specific timeframe. Instead, it identifies and tracks the various KPIs that may be used to assess strategic and operational goals.

Now that you have considered the different types of dashboards, think about the impact that dashboards can have on a company: What is an example of a data source a company might use with a dashboard? How would a company benefit from a dashboard that uses this data? What industries or businesses might benefit from using

dashboards more than others? Now, write 2-3 sentences (40-60 words) in response to each of these questions. Enter your response in the text box below.

Dashboards can help companies perform many helpful tasks, such as: Track historical and current performance. Establish both long-term and/or short-term goals. Define key performance indicators or metrics. Identify potential issues or points of inefficiency. While almost every company can benefit in some way from using a dashboard, larger companies and companies with a wider range of products or services will likely benefit more. Companies operating in volatile, or swiftly changing markets like marketing, sales, and tech also tend to more quickly gain insights and make data-informed decisions.

Big Data and Small Data

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Mathematical Thinking
+ breaking down problems step after step
+ using mathematical thinking to do the right things
+ e.g. choosing the right data tool by data size

Small data
+ specific
+ short time-period
+ day-to-day decisions

Big data
+ large and less-specific
+ long time-period
+ large scale questions and problems
+ needs to be broken down to analyse
+ help companies to make big decisions

Bed Occupancy Rate
L>Total # of inpatient days for a given period * 100
      / (available beds X # of days in the period)
L> in order to track that we have to choose the right tool
L> a lot of patient data over a long time -> SQL is a great choice

Small data	Big data
Describes a dataset made up of specific metrics over a short, well-defined time period	Describes large, less-specific datasets that cover a long time period
Usually organized and analyzed in spreadsheets	Usually kept in a database and queried
Likely to be used by small and midsize businesses	Likely to be used by large organizations
Simple to collect, store, manage, sort, and visually represent	Takes a lot of effort to collect, store, manage, sort, and visually represent
Usually already a manageable size for analysis	Usually needs to be broken into smaller pieces in order to be organized and analyzed effectively for decision-making

Challenges and Benefits
- organisations deal with data overload and unimportant information
- important data can be hidden deep down with non-important data
- the data we need is not always easily accessible
- technology tools can lead to unfair algorithmic bias
+ data can help companies identify more efficient ways do business
+ big data can spot trends
+ analysing big data gives better understanding of current conditions
+ big data helps to keep track of presence and feedback

The 3-4 V Words For Big Data

Volume	Variety	Velocity	Veracity
The amount of data	The different kinds of data	How fast the data can be processed	The quality and reliability of the data

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Glossary

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Terms and definitions for Course 2, Module 2

Algorithm: A process or set of rules followed for a specific task

Big data: Large, complex datasets typically involving long periods of time, which enable data analysts to address far-reaching business problems

Dashboard: A tool that monitors live, incoming data

Data-inspired decision-making: The process of exploring different data sources to find out what they have in common

Metric: A single, quantifiable type of data that is used for measurement

Metric goal: A measurable goal set by a company and evaluated using metrics

Pivot chart: A chart created from the fields in a pivot table

Pivot table: A data summarization tool used to sort, reorganize, group, count, total, or average data

Problem types: The various problems that data analysts encounter, including categorizing things, discovering connections, finding patterns, identifying themes, making predictions, and spotting something unusual

Qualitative data: A subjective and explanatory measure of a quality or characteristic

Quantitative data: A specific and objective measure, such as a number, quantity, or range

Report: A static collection of data periodically given to stakeholders

Return on investment (ROI): A formula that uses the metrics of investment and profit to evaluate the success of an investment

Revenue: The total amount of income generated by the sale of goods or services

Small data: Small, specific data points typically involving a short period of time, which are useful for making day-to-day decisions

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