

Schedule Overview & Planner

| | | Monday | Tuesday | Wednesday | Thursday |
|--------|----|--|---|---|--|
| WEEK 1 | AM | Data Terms and Jargon Busting Workshop | Individual Contributions and Team Selection | Sprint A: Task 1 Proposal | PowerBi Workshop |
| | PM | London Datastore Capstone Project launch | Introduction to Agile Teams Methodology + Guest Speaker | Task 1 Group Presentation | Data Modelling Workshop |
| WEEK 2 | AM | Sprint B: Task 2 Creation | Sprint B: Task 2 Creation | Sprint C: Task 3 Prepare Presentation | Final Solution Presentation |
| | PM | Sprint B: Task 2 Creation | Data Storytelling Workshop | Using Raw Data in Industry/Sector + Guest Speaker | Self-Reflection and Project Wrap-Up Workshop |

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Guest Speaker

ANDY BLEACH

- Developer and Scrum Master background
- Trainer and Content Workflow Manager at Atrium Consulting Limited
- Consultancy portfolio working on different projects from migrating environments, determining technical solutions for clients, and implementation of DevOps



[LinkedIn](#)

Guest Speaker

JONATHAN BELSEY

- Medical advisor and Head of Clinical Development background, for the last 25 years working as a Health Economist
- Owner of JB Medical Limited specialising in clinical trial data and development of health economic models to inform purchasing decision-making
- “Scientist that uses data” with specialities in population needs and data queries of NHS databases



[LinkedIn](#)

Introduction to Applied Data Science

Dr Laura Marulanda-Carter



Recommended Applications & Software

[Power BI Desktop—Interactive Reports | Microsoft Power BI](#) 
(can be downloaded for free - different language options available)

[Tableau for Students](#) (can be downloaded for free, student license code valid for one-year requires validation through student email)



Welcome

DR LAURA MARULANDA-CARTER

- Joined Escape Studios in 2021 in my role as Head of Tech & Data Hub
- Representative of UN Women UK, Tech Women 100 winner, featured articles in The Telegraph and The Conversation
- Co-designed curriculum with Microsoft, McAfee, Evidence Talks, Sainsburys and VWFS



laura.marulanda.carter@gmail.com

Learning Outcomes

The objective of these sessions is to equip learners with the skills to use data science principles and techniques in practice.

By the end of these sessions, you will be able to:

- Understand how to develop a **shared understanding of data terms** when preparing to work with others
- Demonstrate **agile team working** principles and methodologies in practice
- Showcase **key data science concepts for problem-solving** as part of a group project
- Present a **data science solution** to a range of different audiences

Journey to Applied Success



Knowledge



Skills



Behaviours

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What's coming up in the next sessions

Week 1

- Shared understanding of key data terms and jargon
- Explore Capstone Project with London Data Store
- Work in an agile team and put methodologies in practice

Week 2

- Team Progress Update and review milestones
- Capstone Project Final Presentation
- Team Wrap-Up and Self-Evaluation

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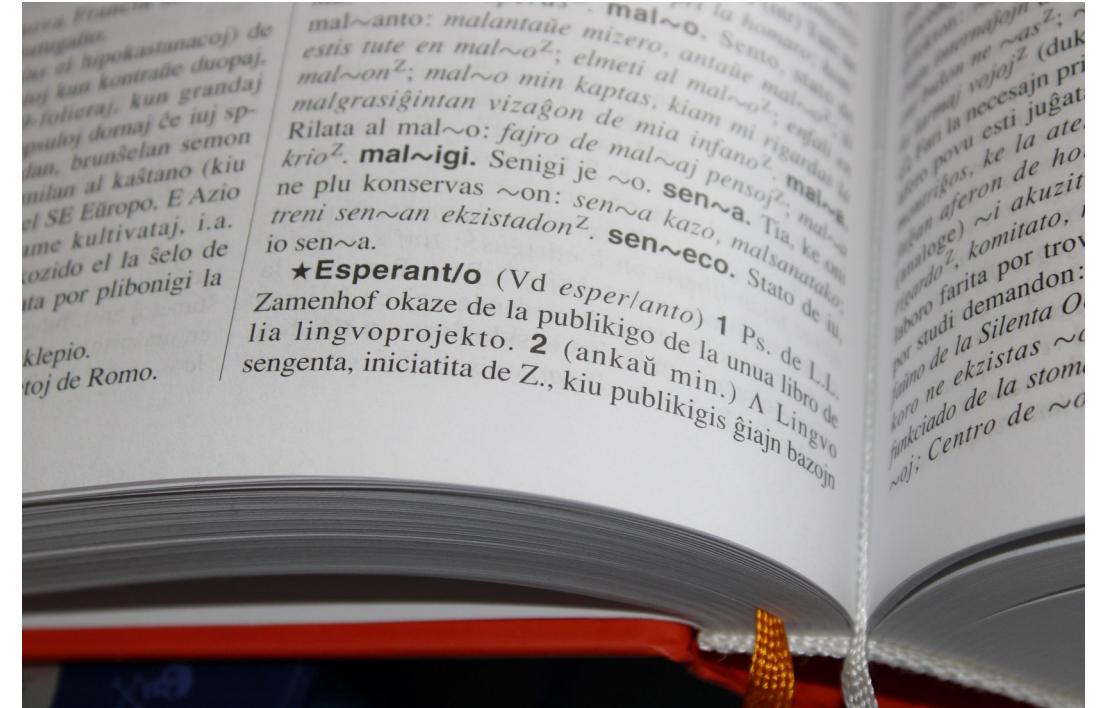
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Data Terms & Jargon Busting

Expanding on the use of a data dictionary

Whilst a **data dictionary** is often reserved for databases or software development/programming, in their simplest form they provide a **formalised and controlled means of naming and defining items**.



What we want to be able to do is to **build** on our own understanding of key terms and then use this within our teams to create a **shared understanding**.

Activity: Agree shared meaning of terms

| Datasets | Data granularity | Data analysis | Data storage | Data table |
|------------------------------|---------------------------|-------------------------------|------------------------------|--------------------|
| Data outliers | PowerBi | Relationships and Cardinality | Data import errors | Group and bin data |
| Data Structure | Relationship dependencies | Data classification | Visualise data | Troubleshooting |
| Database | Data Model | Performance optimisation | Data Reporting | Data Dashboard |
| Data schemas and hierarchies | Import Data | Key Performance Indicators | Format and configure visuals | Custom Visuals |
| Statistical functions | Clustering | AI Insights | Data lineage | Data Protection |

Share some of your examples



As understood by Microsoft

| Datasets | Data granularity | Data analysis | Data storage | Data table |
|--|---|---|--|------------------------------------|
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Do we agree? If not, why not?



Padlet



:Padlet

Marulanda-Carter, Laura • 2m

Agreed Data Terms & Jargon

Add your agreed terms and definitions

+

[Link to Padlet - Password IBS2024](#)

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An aerial photograph of the London skyline during sunset or sunrise. The image captures the River Thames flowing through the city, with the Tower Bridge and its iconic red towers prominently featured in the foreground. In the background, the modern skyscrapers of Canary Wharf stand tall against a hazy sky. The overall atmosphere is a mix of industrial and architectural beauty.

London Datastore Capstone Project

About London Datastore

- The London Datastore has been created by the **Greater London Authority (GLA)** as a first step towards freeing London's data.
- They want everyone to be able **access the data** that the GLA and other public sector organisations hold, and to **use that data** however they see fit – for free.
- **Raw data** often doesn't tell you anything until it has been presented in a **meaningful way** and most people don't have the tools to do this.
- Backed strongly by Sadiq Khan, **Mayor of London**, they are keen for you to **visualise or build apps** from the data available on the site.

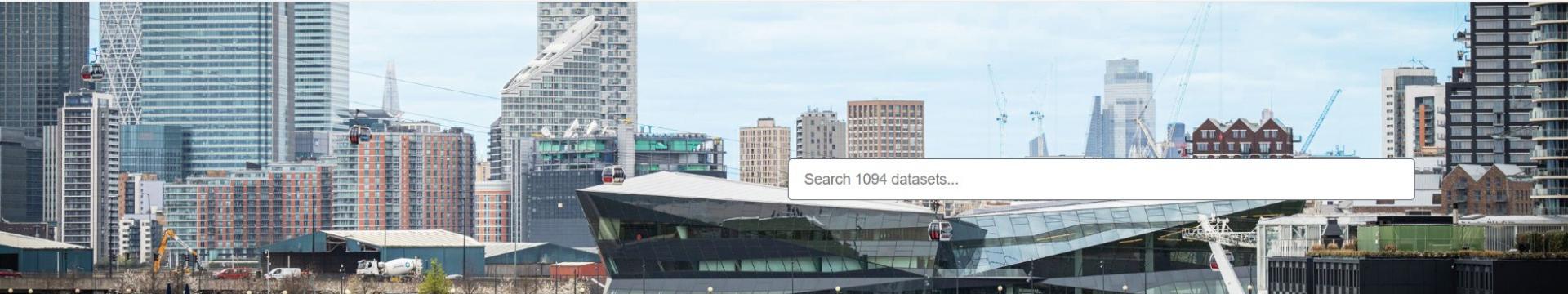
London Datastore

MAYOR OF LONDON LONDON ASSEMBLY

LONDON DATASTORE

 Login Q

Data Analysis ▾ Collaboration ▾ COVID-19 Area Profiles Blog Guidance About



Search 1094 datasets...

00

JOBs AND ECONOMY **TRANSPORT** **ENVIRONMENT** **COMMUNITY SAFETY** **HOUSING** **COMMUNITIES** **HEALTH** **LONDON AS A WORLD CITY**



Click on a circle to see more...

[Link to Datastore](#)

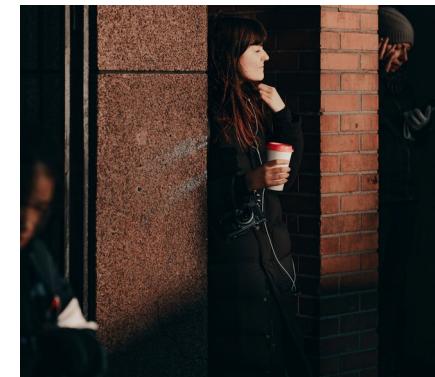
Activity: Identify THREE topics and datasets



Client Scenario

The client **city planner** is responsible for the design and development of urban areas, including community needs and developing **short- or long- term plans**. Urban planning is a valuable force for city leaders to achieve sustainable development and **bringing about a difference** to the communities it serves. The client city planner is looking for ways to **improve the quality, performance, and safety** of its existing eco-system. However, their primary focus is on finding ways to ensure **optimal efficiency** and increasing its use of technologies to inform its **smarter cities strategic policy and agenda**.

Much of the data gathered by the client city planner is made available publicly including but not limited to transportation, environment, health, education, infrastructure, jobs, and economy. This data is stored in a variety of **different formats**.



Client Brief

The client city planner believes that a combination of both **historical** (meaning persistent data storage) and **real time** (meaning streamed from the source) data could be used to identify ways of **improving city services** and/or **provide insights** into how the **city's population** could become more **sustainable**. They would also like to understand how different **data sources** come together to bring a **better understanding** of the city's overall performance.

They require a **data dashboard** that is capable of **visualising multiple sources of data** of the city's ecosystem. Also, they need a dashboard that is readily accessible to be used by a **variety of different audiences**.



Discussion: Summarising Client Outline

- **Company type** – *Specialises in city planning.*
- **Their products** –
- **Their customers' expectations** –
- **Their current situation and how they do things now** –
- **Their projected needs and goals** –

Client Summary Outline

- **Company type** – Specialises in city planning.
- **Their products** – Service-led, to develop and set policies and agenda for transport, the local economy, jobs, green infrastructure, renewable energy, climate change, etc.
- **Their customers' expectations** – A city that is purposefully designed and built to serve its community.
- **Their current situation and how they do things now** – Currently, they collect data locally and then categorise data sets based on topics, trends, or themes for members of the public and/or organisations to use. They have access to the data but don't have the capability to process, analyse and visualise it.
- **Their projected needs and goals** – The client city planner would like to find ways to bring data sources together and visualise data to create meaningful insights.

Task 1 – Design a proposal

Design a proposal that frames **how a data visualisation tool*** offers the capability to design a solution to meet the client's needs and goals.

In the first phase of this project, you will be working to understand your client's needs and using what you know about data services to design a solution. By the end of this task, you should have a clear idea of **what your client's needs are** and **how your solution meets those needs**. You will be using this information to create a presentation in Task 3, so be sure that you have all the following documented:

- Summary description of client's current situation, their needs, and their goals
- Proposal of how data visualisation tools and data services provide the capabilities to design a data solution to meet the client goals
- Proposal for the design of a data dashboard, including a [wireframe](#).
- Expected costs – you may use online pricing calculators for this or develop your own cost model.
- Consideration of data security and access control to various data levels.
- Benefits to their clients.



Task 1: Capstone Rubric

| | Approaches Standard | Meets Standard | Exceeds Standard (includes items in Meets Standard) |
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| Recommended data solutions for the client and reasoning | Not all recommendations fit the client, or cover all aspects of the course, or demonstrate an understanding of data services | Recommendations fit clearly with an understanding of the client. Recommendations consider services and solutions from the course. Reasoning for recommendations demonstrates an understanding of data services | Recommendations at times evidence critical thinking and explain products and services that weren't chosen and a rationale as to why |
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Task 2 – Create/implement data model & dashboard

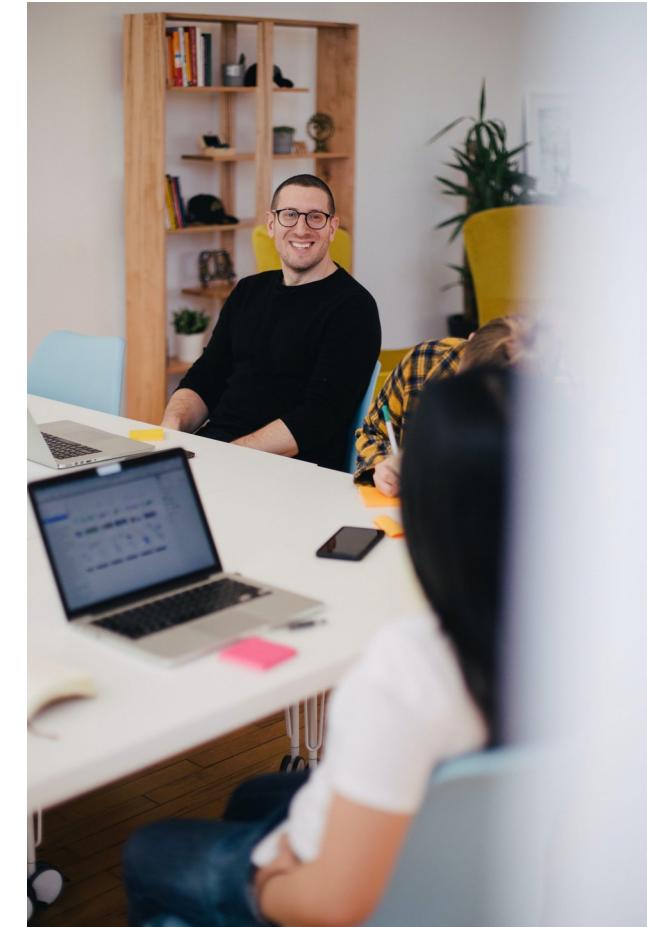
Create/implement a **data model diagram** and **dashboard solution**. There are several free to use web-based diagramming tools that are suitable for the task.

Be sure to include the following in your data model:

- **Visual** of the whole system or parts of it to communicate connections between data points and structures.
- Highlight **relationships** between data services, data sets and tables through connections.
- Identify decisions made that have led to each of the driving questions, customer endpoints, and how data is to be processed and stored inside the system.

Your solution should demonstrate the following:

- **Import a dataset** using a data visualisation tool by carrying out clean, transform, and load tasks.
- Visualise a range of **meaningful insights** from the processed data using suitable **queries**.



Task 2: Capstone Rubric

| | Approaches Standard | Meets Standard | Exceeds Standard (includes items in Meets Standard) |
|--|---|--|---|
| Visualise through a diagram a data model | Outline of data model presented | Diagram of data model presented | Including supportive commentary |
| Data model diagram highlight relationships/connection s | Some of the data model evidence interconnectivities but lacks cohesiveness and detail | Data model interconnection and relationships are presented correctly and clearly | Data model interconnection is well-considered and detailed to a good standard |
| Create a dashboard | Dashboard include one tile or only one kind of visualisation or does not relate to the business described | Dashboard includes two or more tiles, with different visualisations, and relates to the business described | Dashboard includes three or more tiles with different visualisations |

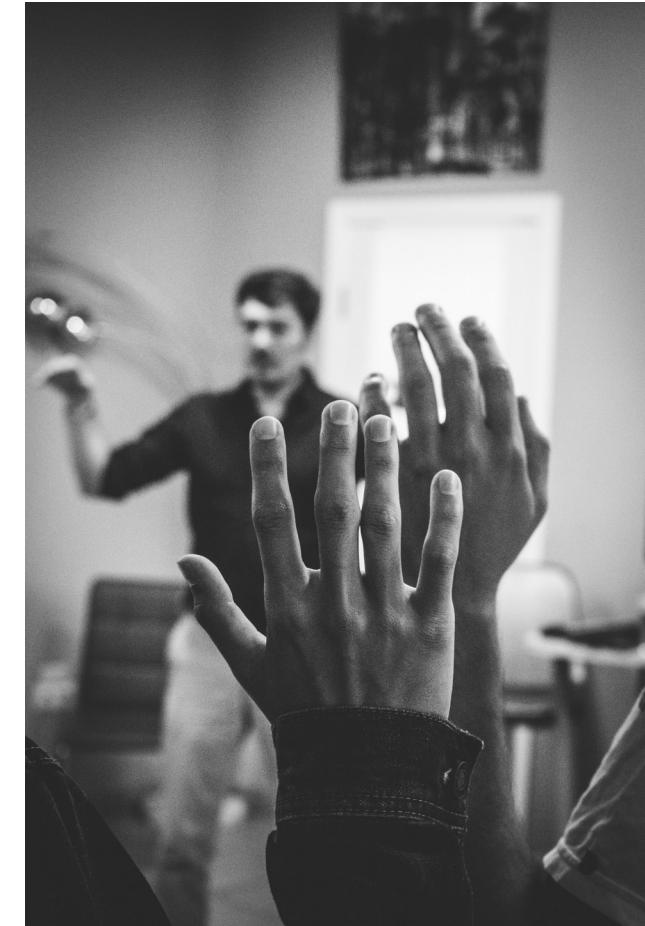
Task 3 – Present data solution

Present the data solution utilising your choice of data visualisation tools.

In this phase, you will deliver a **fifteen-minute presentation** that **showcases your final dashboard**. You should take the opportunity to share with your peers how you did this – both in terms of strategy and how this came together visually.

After the presentation, you will take the opportunity to reflect on how your group came together. What went well, what did not, what would you do differently in future? Others will have an opportunity to ask you questions about your process and recommendations.

Make sure you include clear **evidence to support decisions** made, and that your **presentation is organised** and detailed enough for your audience to have a good understanding of the **benefits of your recommendations**. If you wish, your presentation should also **include an additional communications item** (e.g. poster, handout, guide/leaflet, presentation, tutorial, blog, vlog) to demonstrate **how the dashboard is expected to be used by users**.



Task 3: Capstone Rubric

| | Approaches Standard | Meets Standard | Exceeds Standard (includes items in Meets Standard) |
|---------------------------------------|--|---|---|
| Presenter aids | Presenter does not describe how the data solution can add value to the client business | Presenter describes several aspects of the data solution, referencing the architecture diagram, and explains how the solution adds value to the client business | Presenter describes a flow, dashboard, and as part of data solution, referencing each in the architecture diagram and explaining how the work together to add value to the business |
| Presentation aids | Not all materials are organised or easy to understand. Not all visual and/or audio elements help audience understanding, some might distract | Materials are organised and clear. Visual or audio elements help audience understanding | Materials are interesting, easy to understand, and include at least one way to gather audience responses beyond just asking if there are any questions |
| Delivery of presentation | Presenter isn't prepared or doesn't engage with the audience | Presenter is prepared and engaged with the presentation and the audience. Communication of ideas is mostly clear and effective | Presenter communicates beyond just reading the words on the presentation materials. Communication of ideas is consistently clear and effective |
| Quality of communications item | Not all materials are organised or easy to understand. | Materials are organised and clear. | Materials are interesting, easy to understand. |

Activity: Your initial thoughts and planning

Take the time to consider your thoughts on the project and tasks:

- How would you go about completing this task as project leader?

Take notes about your ideas, dashboard designs, opportunities for supporting clients, which datasets are better than others, what different datasets you would like to use, how data sets could be combined to tell a story, what skills do you need to add value to the project?

- What key decisions need to be made to complete these tasks on time?

What skills set do we need to have in the team? What approach to the project should a team take? What roles are there on the project that need to be adopted? When are the key milestones to creating/implementing data model and final dashboard?

Remember after today you will be working on the project in teams. This is time to consolidate your own thinking before you join a group environment and roles change.

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A close-up photograph showing several pairs of hands from different people, all joined together in a circular, interlocking grip. The hands are of various skin tones and are resting on what appears to be a wooden surface. In the background, there are blurred elements of an office environment, including what might be a computer monitor and some papers.

Individual Contributions & Team Selection

Activity: Skills Audit

The ability to identify the skills needed for each role is rather simple. You can look for **skills gaps**, the number of people who have **critical skills** and also **future skill requirements** for any project.

The ability to **reflect on your own skills** is more difficult part of the process. On the one hand you are looking to **develop new skills and experience**, and on the other you could lead to project delays as you take the **time to learn**.



Agree on **skills required** for project and **score system** on the same scale

The “Roles” in Agile Teams



Agile Team

- Create and refine Stories and acceptance criteria
- Define, build, test, and deliver Stories
- Develop and commit to team PI Objectives and Iteration plans
- Five to eleven members



Scrum Master

- Coaches the Agile Team and facilitates team meetings
- Removes impediments and protects the team from outside influence
- Attends scrum of scrum meetings



Product Owner

- Creates, prioritizes and accepts Stories
- Acts as the Customer for team questions
- Works with Product Management to plan Program Increments (PI)

Activity: Preparing your elevator pitch

You had the opportunity to consider the **London Capstone Project** individually yesterday. By the end of the session you will be **assigned groups**.

In agile teams you are expected to **present your thoughts** quickly and effectively. With that in mind, take some time to prepare an **elevator pitch** to share with the group.

You will have 60-seconds to:

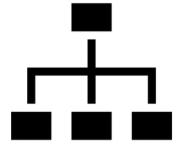
- Outline your initial ideas for the London Capstone Project
- Your skills and what you bring to the team
- Preferred role as an Agile Team Member or Scrum Master



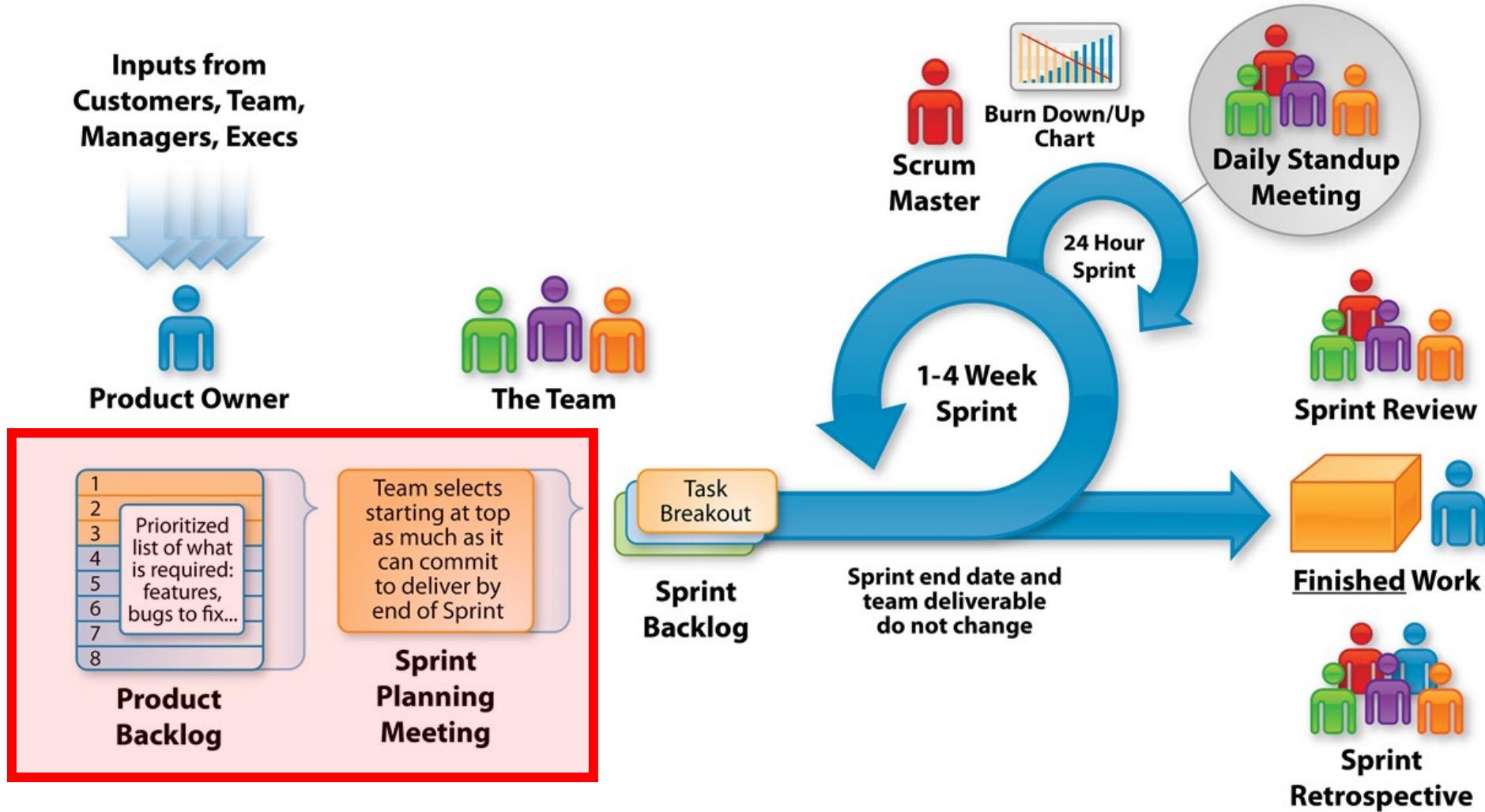
Share your Elevator Pitch!



Team Selection and Set Milestones



Scrum Framework



Vote on Priorities and Agree Next Steps



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Agile Teams Methodology

What is an agile team?

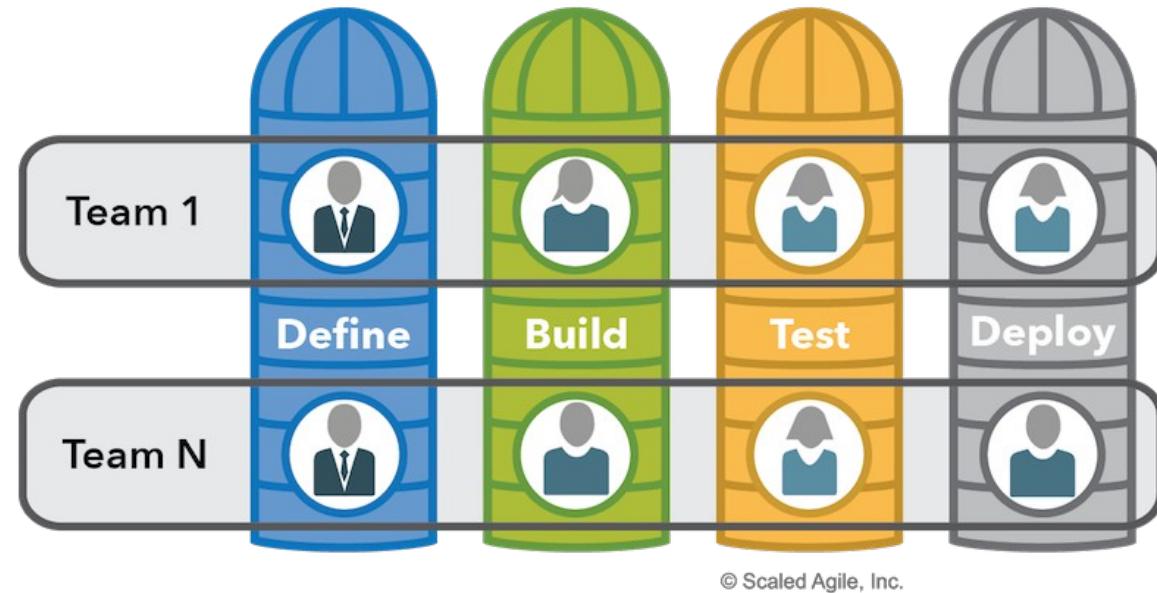
An **agile team** is a **cross-functional** group of people who define, build, test, and deliver an increment of **value** in a **short time box**



Solution delivery requires **broad** and **diverse** skills. Teams follow a **process** to define, build, test, and-where applicable-deploy.

Agile Skills: Define, Build, Test & Deploy

- **Define** – independently elaborate and design features and stories to accomplish their mission
- **Build** – contain all skills necessary to create the artifacts to meet their mission
- **Test** – ensure an artifact's quality and performance
- **Deploy** – where applicable, deploy increments of value



The “Roles” in Agile Teams



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Scrum Master

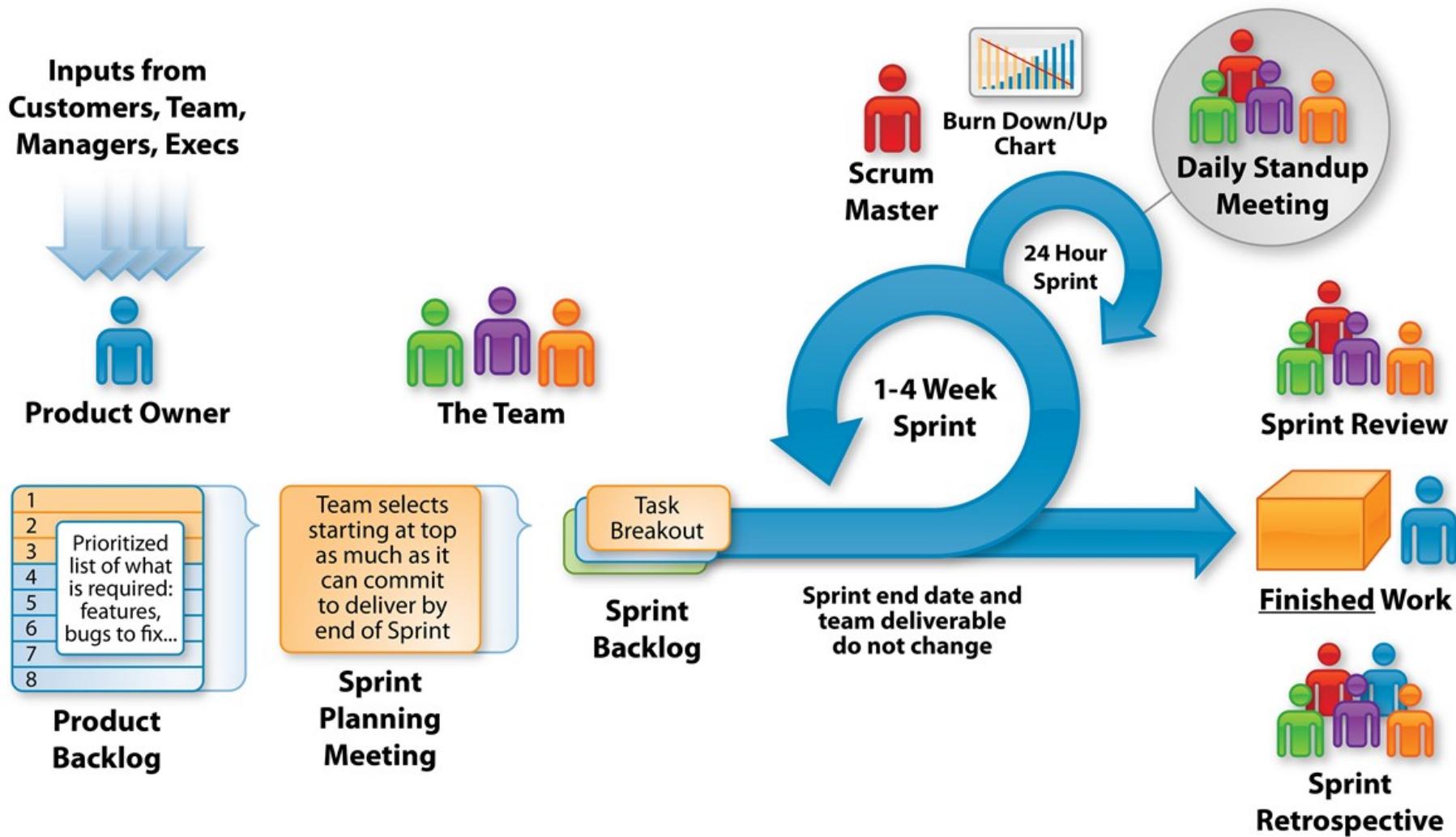
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Scrum Framework



Agile teams have well-defined responsibilities

- **Collaborate** with the Product Owner to **create and refine** user stories and **acceptance criteria**
- Participate in **planning** and create iteration plans when setting **team objectives**
- Develop and **commit** to objectives, goals, **size** and **complexity** of work
- Conduct **research**, **design**, prototype, and other **exploration activities**
- Create and **test** work products defined by their features
- Continuously improve the team's **processes**

Guest Speaker

ANDY BLEACH

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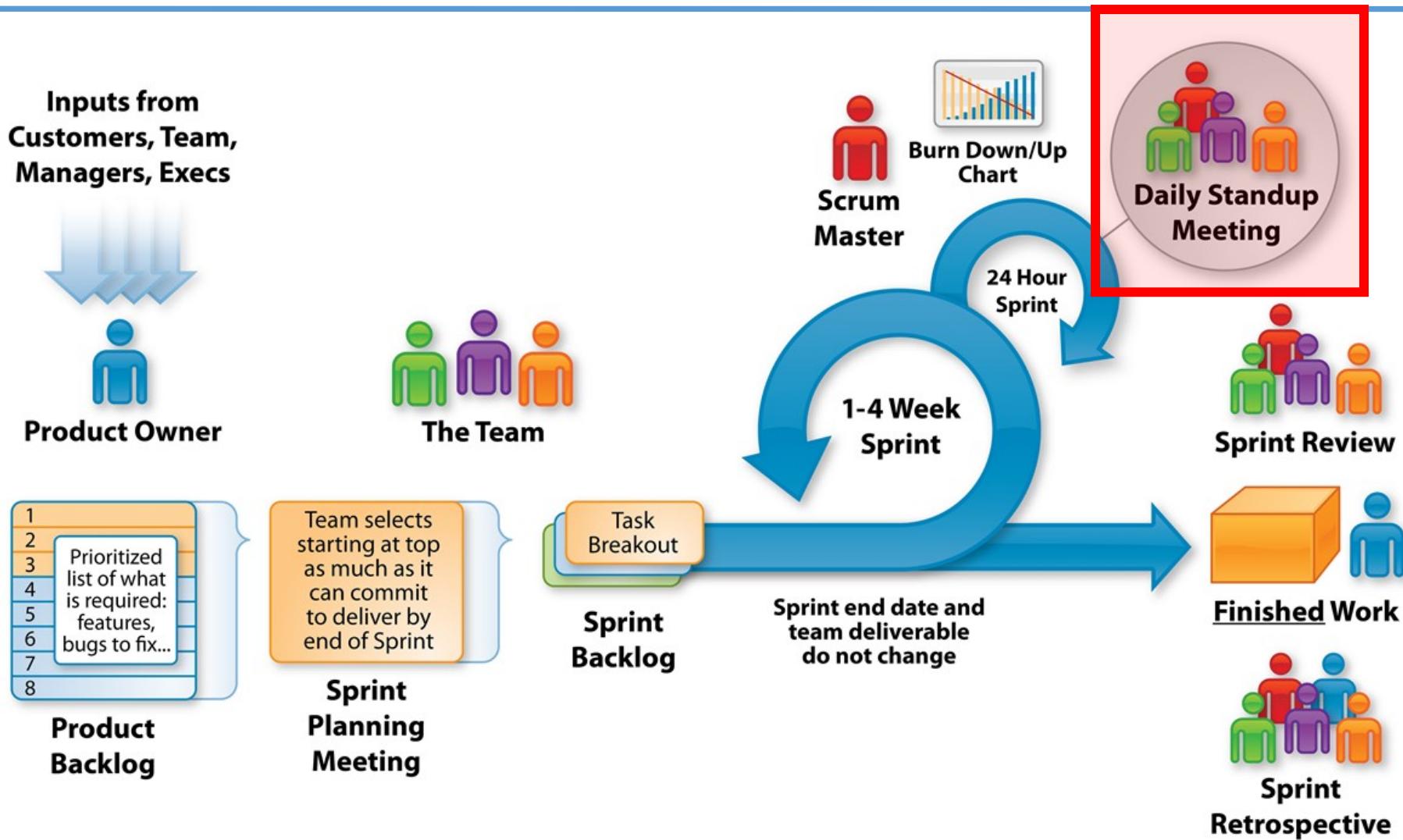
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Scrum Framework



Daily Stand-up

The daily scrum is a **brief communication** and status check session facilitated by the Scrum Master where teams **share progress**, report impediments and **make commitments** for the current **sprint**.

You can create a **scrum task board** that serves as the focal point of the meeting, and should be held at the same time every day (ideally in the morning). Stand-up should be kept to strict timeframe (so people have time to get stuff done!).



Three questions: What did I accomplish yesterday? What will I commit to or complete today? What obstacles are preventing me from meeting my commitments?

Daily Stand-up Meeting (Team: _____)

What did we accomplish yesterday?

What will we commit to, or complete, today?

What impediments or obstacles are preventing me from meeting commitments?

Scrum Framework

Inputs from
Customers, Team,
Managers, Execs



Product Owner

| | |
|---|--|
| 1 | |
| 2 | |
| 3 | Prioritized list of what is required: features, bugs to fix... |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

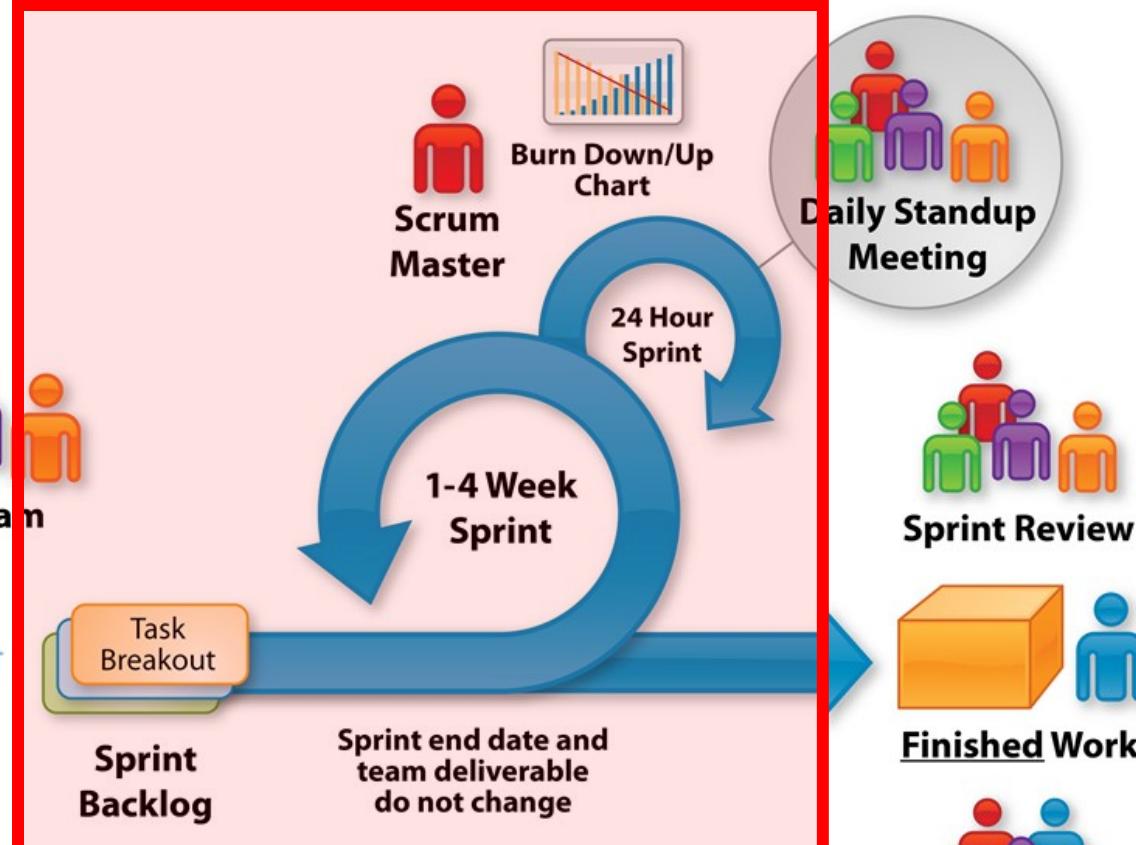
**Product
Backlog**



The Team

Team selects
starting at top
as much as it
can commit
to deliver by
end of Sprint

**Sprint
Planning
Meeting**



**Daily Standup
Meeting**



Sprint Review



Finished Work



**Sprint
Retrospective**

Agile Team: Sprint

Set your group tasks
and get to work.

You have until
Thursday lunch to
prepare your
proposal and make a
presentation to the
rest of the group.

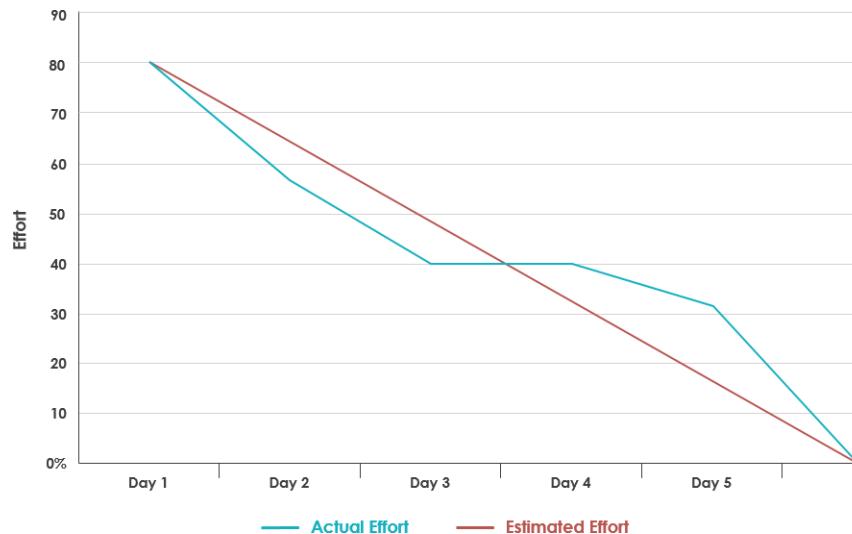


Scrum Master: Track Daily Progress

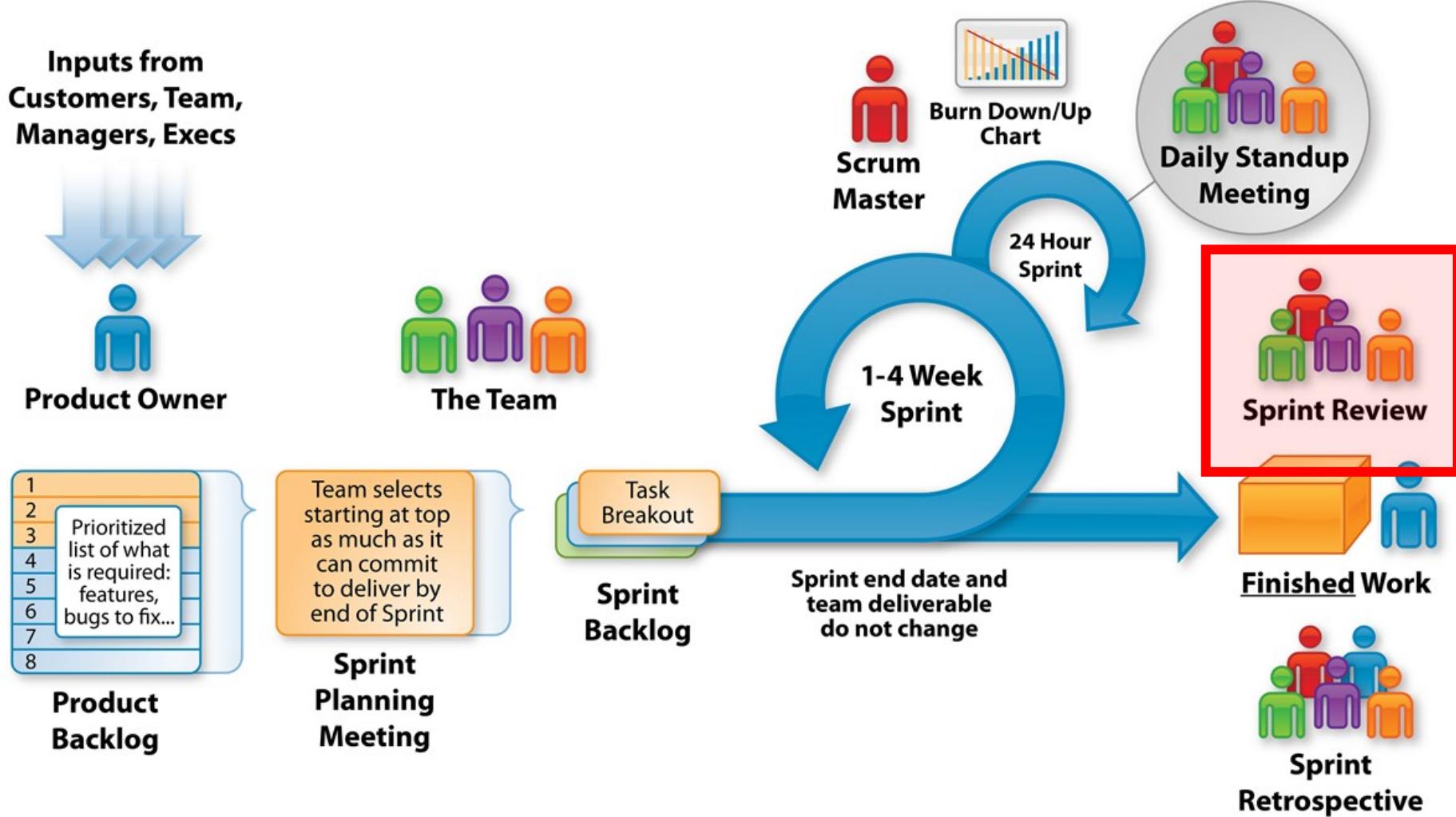
As you and your team complete tasks, you are also responsible for compiling a **burndown chart** in scrum.

You have until Thursday lunch to prepare your **burndown chart** and include this as part of your **presentation** to the rest of the group.

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| Task 1 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |
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| Task 3 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |
| Task 4 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |
| Task 5 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |
| Task 6 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |
| Task 7 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |
| Task 8 | 10 | 3 | 2 | 0 | 1 | 4 | 10 |



Scrum Framework

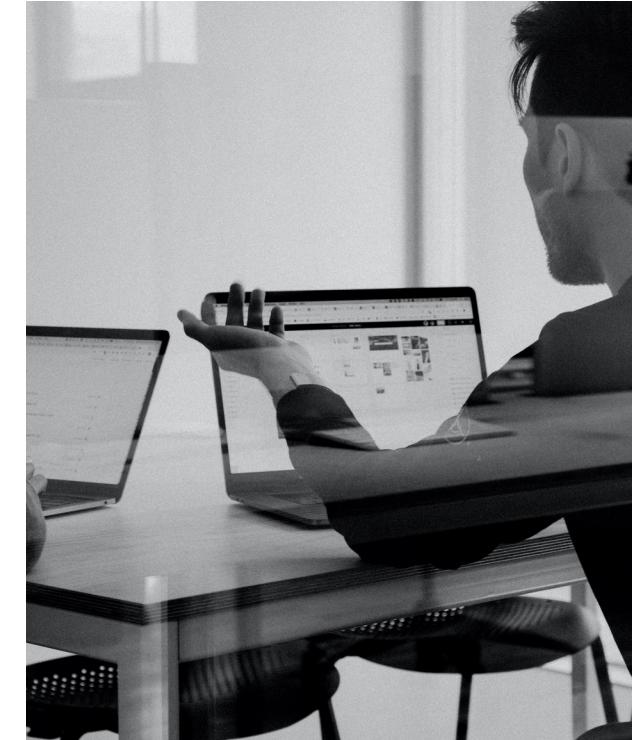


Sprint Review

The scrum team in a review take the time to consider **what has been accomplished** in the sprint and **what has changed in their environment**.

If necessary, it may be required to make a **Product Backlog** (list of improvements/tasks to improve).

Every member of the scrum team should be given the **opportunity to contribute**.



Things to include: Product Backlog (list of improvements), summary of what went well, overall progress on project, review of resources (capabilities, timeline, etc.)

Task 1 Presentation w/Burndown and Review

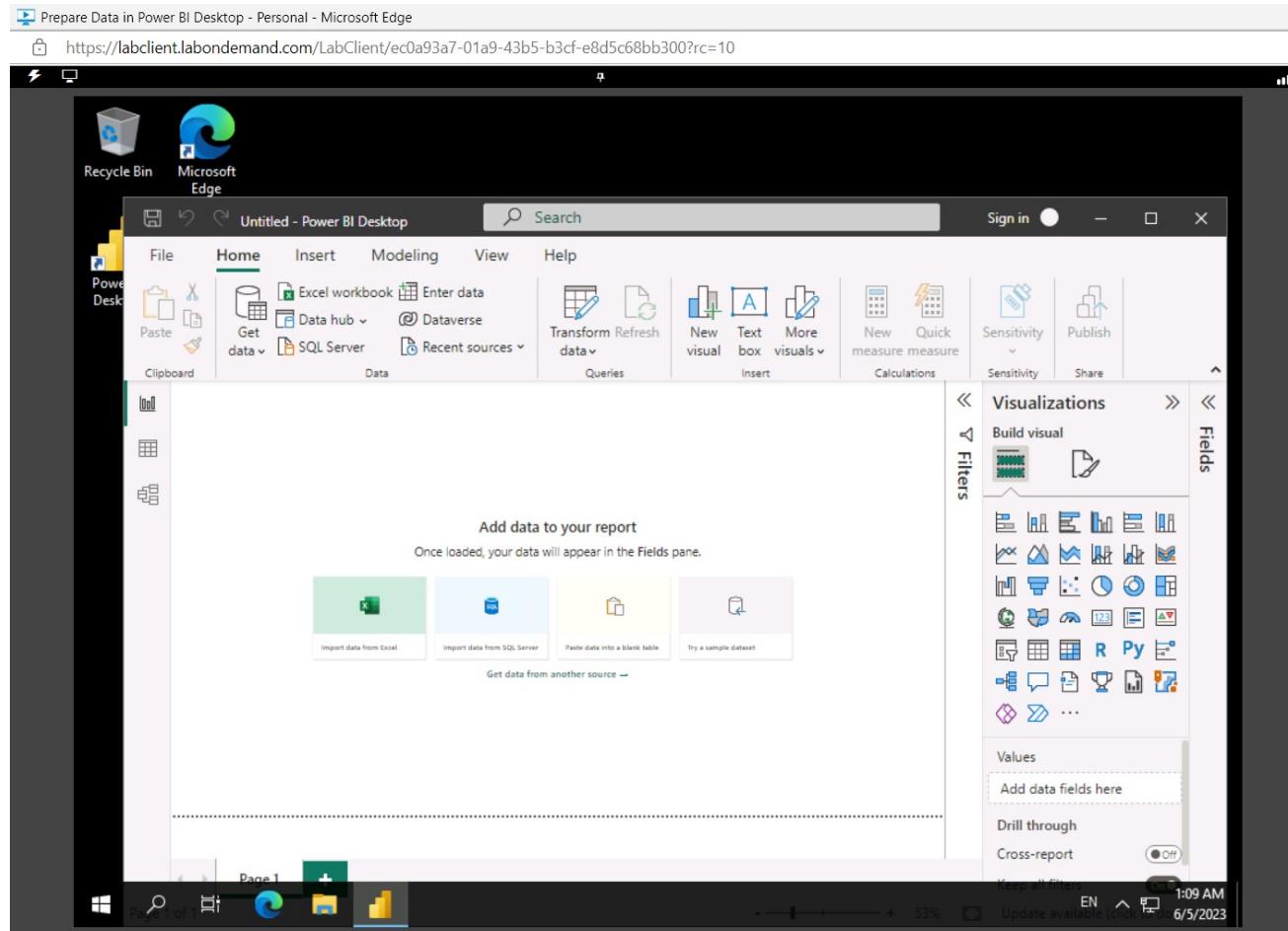


Schedule Overview & Planner (Summer)

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|--------|----|--|---|---|--|
| WEEK 1 | AM | Data Terms and Jargon Busting Workshop | Individual Contributions and Team Selection | Sprint A: Task 1 Proposal | PowerBi Workshop |
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Lab 1 Exercise – Prepare data in Power BI Desktop

Prepare Data in Power BI Desktop - Personal - Microsoft Edge
<https://labclient.labondemand.com/LabClient/ec0a93a7-01a9-43b5-b3cf-e8d5c68bb300?rc=10>



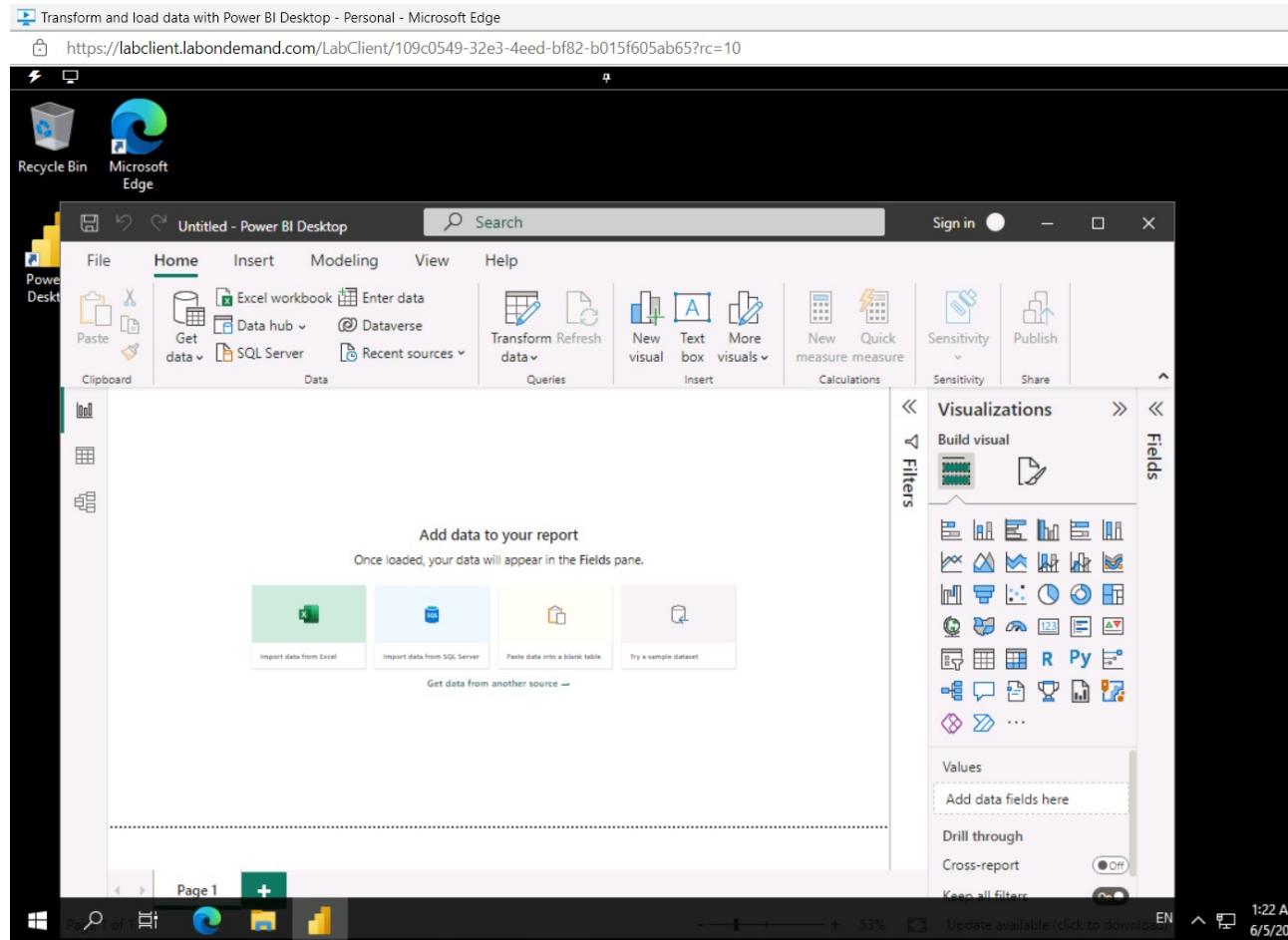
The screenshot shows the Microsoft Edge browser displaying a lab client page for Power BI Desktop. The main window is Power BI Desktop itself, showing the 'Home' ribbon tab selected. The central area says 'Add data to your report' with options like 'Import data from Excel', 'Import data from SQL Server', and 'Paste data into a blank table'. To the right is a 'Prepare Data in Power BI Desktop' sidebar with a timer ('1 Hr 57 Min Remaining'), instructions, and a task list:

- Task 2: Get data from SQL Server**
- This task teaches you how to connect to a SQL Server database and import tables, which create queries in Power Query.
- Instructions for Task 2:
 - On the **Home** ribbon tab, from inside the **Data** group, select **SQL Server**.
 - In the **SQL Server Database** window, in the **Server** box, enter **localhost**, then select **OK**.
Note: In this lab, you'll connect to the SQL Server database by using **localhost** because gateway data sources can't resolve **localhost**. This isn't a recommended practice when creating your own solutions.
 - If prompted for credentials, in the **SQL Server Database** window, select **Use my current credentials**, and then **Connect**.
 - In the **Navigator** window, at the left, expand the **AdventureWorksDW2020** database.

Exercise - P
repare dat
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BI Desktop
- Training
Microsoft L
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Lab 2 Exercise – Load data in Power BI Desktop

Transform and load data with Power BI Desktop - Personal - Microsoft Edge
<https://labclient.labondemand.com/LabClient/109c0549-32e3-4eed-bf82-b015f605ab65?rc=10>



The screenshot shows the Power BI Desktop interface. The Home ribbon is selected, displaying options like 'Enter data', 'Transform data', 'New visual', and 'Sensitivity'. The Fields pane on the right lists various data fields such as DimEmployee, DimEmployeeSalesTerritory, DimProduct, DimReseller, DimSalesTerritory, FactResellerSales, and ResellerSalesTargets. A red box highlights the 'DimEmployee' entry in the list.

Transform and load data with Power BI Desktop
 1 Hr 58 Min Remaining

Instructions Help

Task 2: Configure the Salesperson query

In this task, you'll use Power Query Editor to configure the **Salesperson** query.

Important: When instructed to rename columns, it's important that you rename them exactly as described.

- To open the **Power Query Editor** window, on the **Home** ribbon tab, from inside the **Queries** group, select the **Transform Data** icon.
- In the **Power Query Editor** window, in the **Queries** pane, select the **DimEmployee** query.

Queries [8]

- DimEmployee
- DimEmployeeSalesTerritory
- DimProduct
- DimReseller
- DimSalesTerritory
- FactResellerSales
- ResellerSalesTargets

OneDrive - Pearson PLC
 Up to date

Lab - Load
 data in Po
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 soft Learn

Exercise: Create a Dashboard with Visuals



Schedule Overview & Planner

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Modelling Data

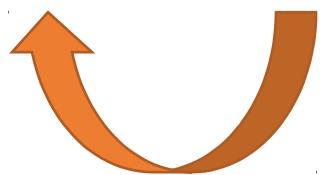
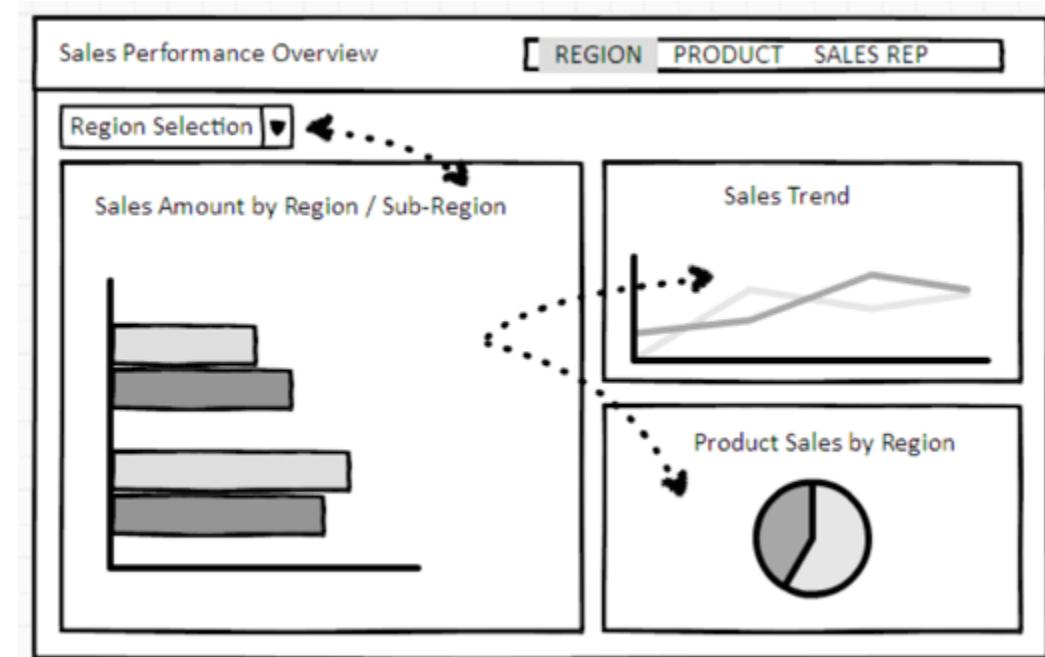
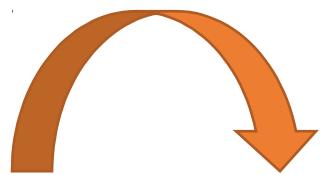
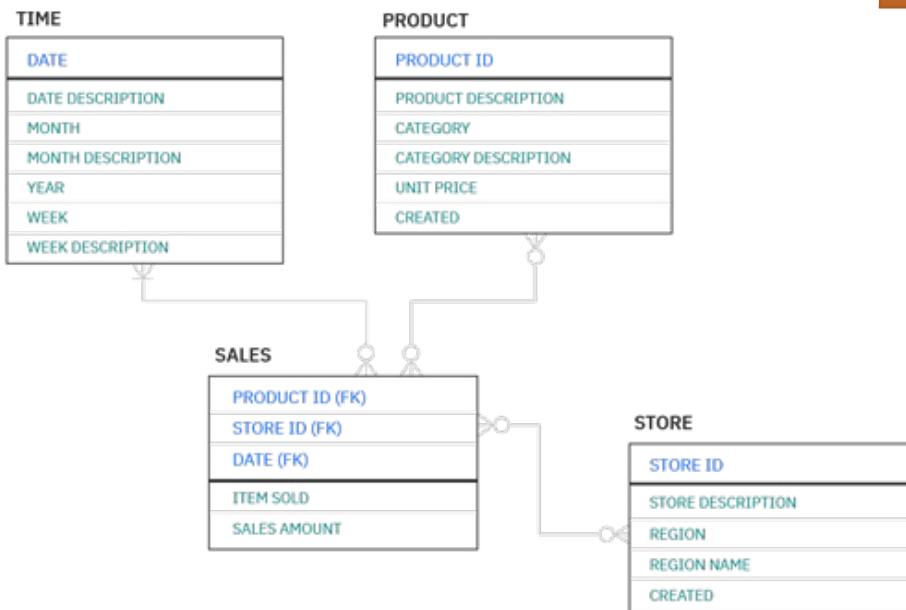
Modelling data is about establishing and maintaining relationships so that you can effectively visualise the data in the form that your business requires.



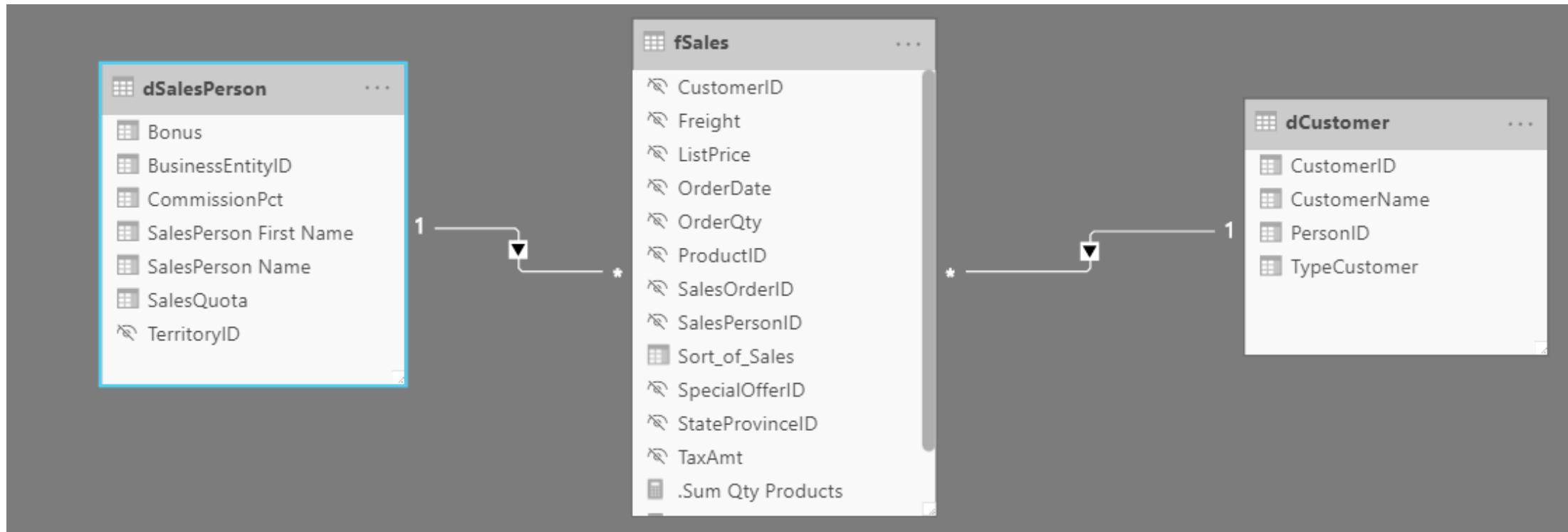
Why? When you are tasked to build visuals, it quickly becomes daunting when webs of relationships are poorly designed and it is no longer clear what relationships and dependencies exist.

Making Data Visual

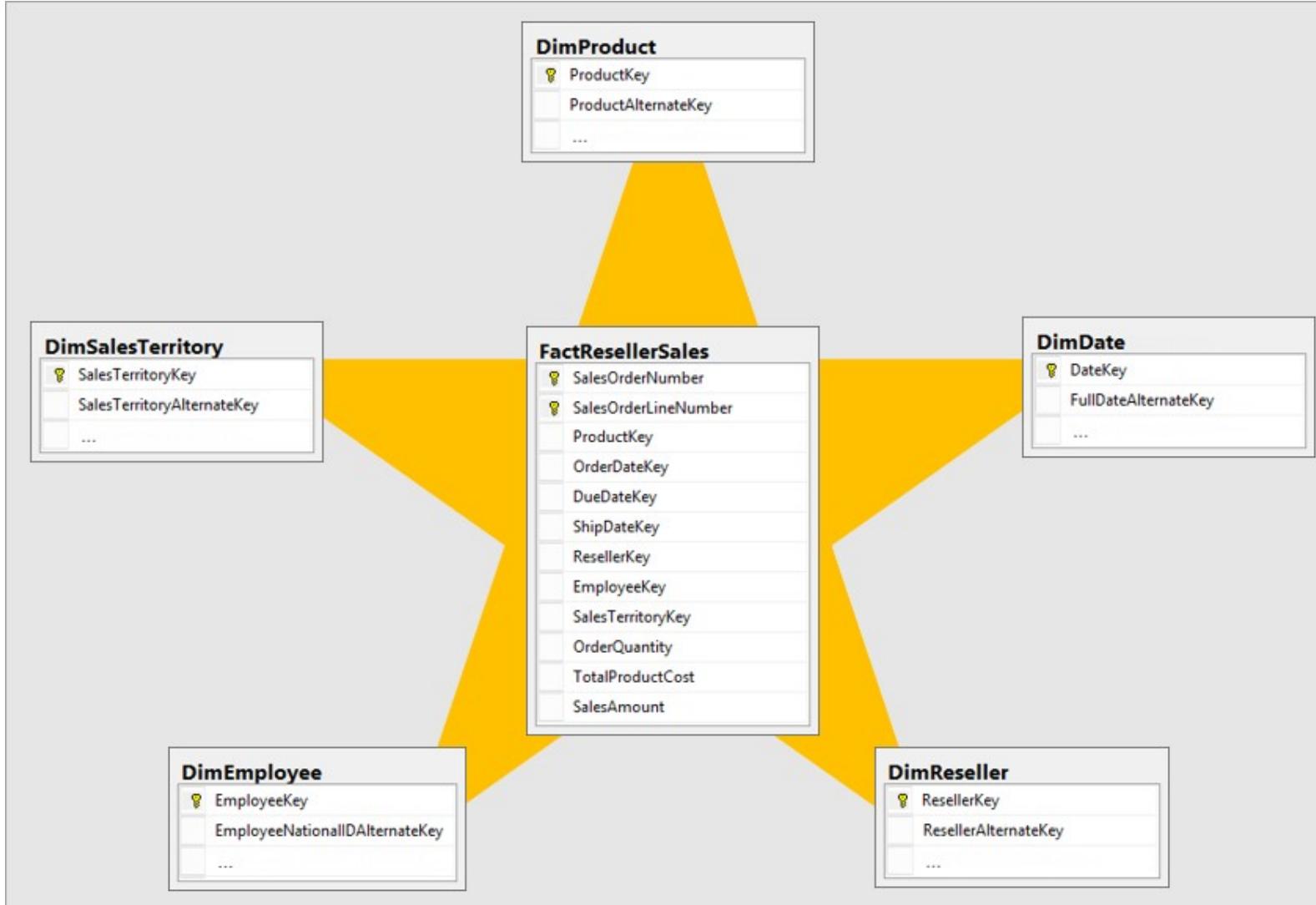
LOGICAL DATA MODELING



Resolving model challenges



Magic of Star Schema



modelling approach widely adopted by **relational** data warehouses to classify the model tables as either

Additional Concepts

There are many additional concepts related to star schema design that can be applied to data models.

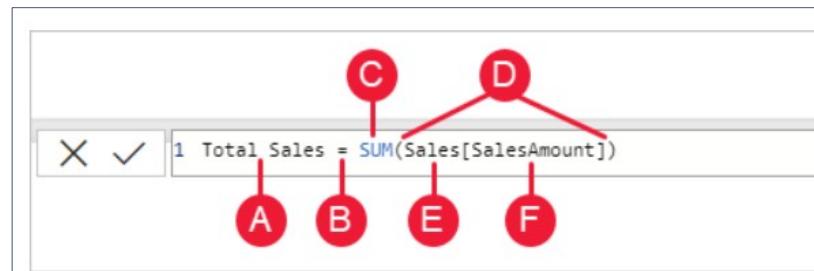
These concepts include:

- **Measures** – fact table column that stores values to be summarised
- **Surrogate keys** – unique identifier that you add to table to support star schema
- **Snowflake dimensions** – set of normalised tables for a single business entity
- **Role-playing dimensions** – dimension that can filter related facts differently
- **Slowly changing dimensions** – one that appropriately manages change of dimension members over time
- **Junk dimensions** – useful when many dimensions and these have few values

DAX Formulas

DAX is a **collection** of functions, operators, and constants that can be used in a **formula** or **expression** to calculate and return one or more values.

DAX helps you create **new information** from data in model (see [Reference Guide](#)).

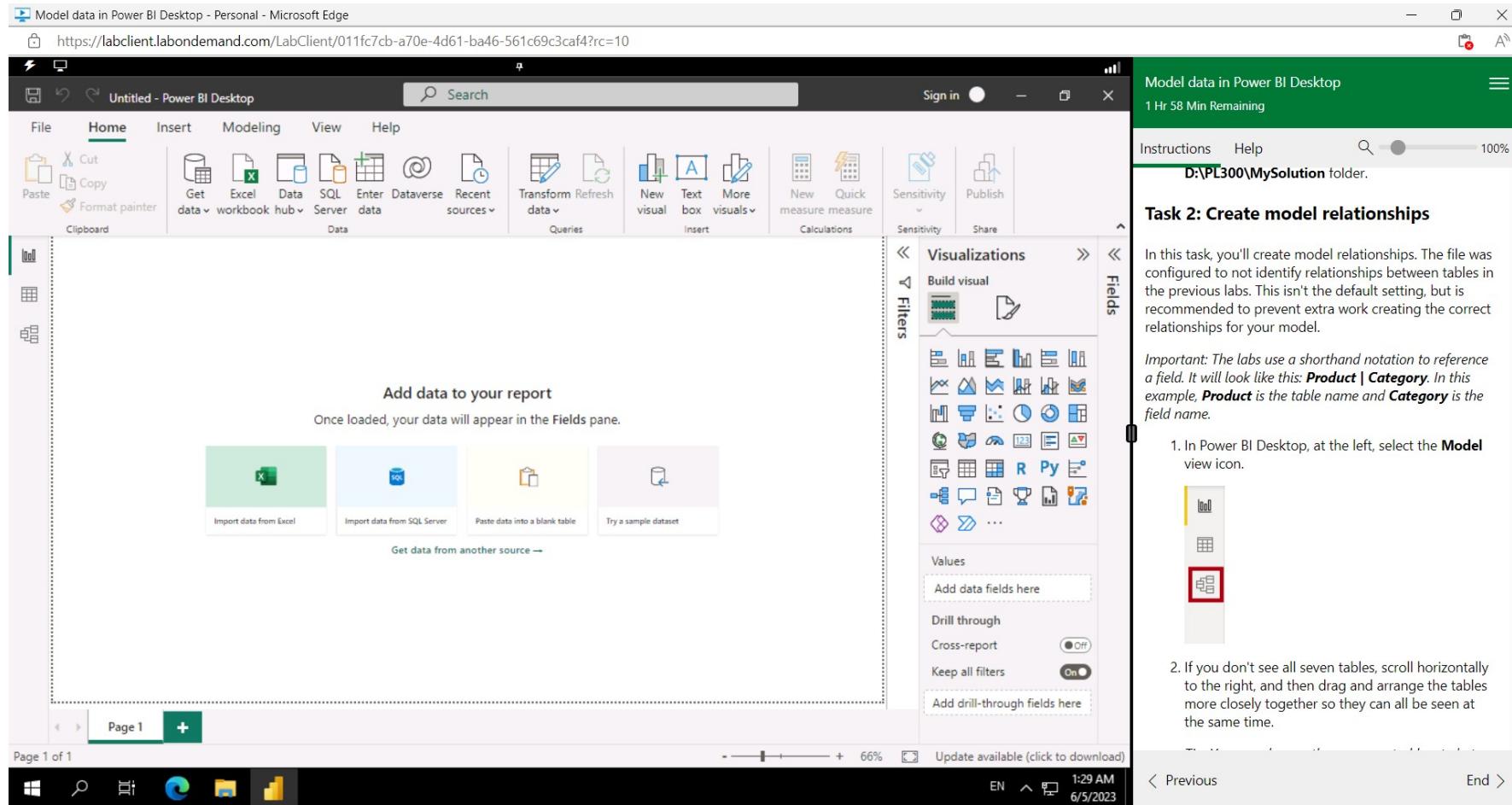


This formula includes the following syntax elements:

- A. The measure name, **Total Sales**.
- B. The equals sign operator (=), which indicates the beginning of the formula. When calculated, it will return a result.
- C. The DAX function **SUM**, which adds up all of the numbers in the **Sales[SalesAmount]** column. You'll learn more about functions later.
- D. Parenthesis (), which surround an expression that contains one or more arguments. Most functions require at least one argument. An argument passes a value to a function.
- E. The referenced table, **Sales**.
- F. The referenced column, **[SalesAmount]**, in the **Sales** table. With this argument, the **SUM** function knows on which column to aggregate a **SUM**.

Lab 3 Exercise – Model data in Power BI Desktop

Model data in Power BI Desktop - Personal - Microsoft Edge
<https://labclient.labondemand.com/LabClient/011fc7cb-a70e-4d61-ba46-561c69c3caf4?rc=10>



Add data to your report
Once loaded, your data will appear in the Fields pane.

Import data from Excel Import data from SQL Server Paste data into a blank table Try a sample dataset

Get data from another source →

Page 1 +

1 Hr 58 Min Remaining

Instructions Help D:\PL300\MySolution folder.

Task 2: Create model relationships

In this task, you'll create model relationships. The file was configured to not identify relationships between tables in the previous labs. This isn't the default setting, but is recommended to prevent extra work creating the correct relationships for your model.

*Important: The labs use a shorthand notation to reference a field. It will look like this: **Product | Category**. In this example, **Product** is the table name and **Category** is the field name.*

1. In Power BI Desktop, at the left, select the **Model** view icon.

A red box highlights the 'Model' icon in the ribbon.

2. If you don't see all seven tables, scroll horizontally to the right, and then drag and arrange the tables more closely together so they can all be seen at the same time.

Lab - Mode
l data in Po
wer BI Des
ktop, Part
1 - Training
Microsoft Learn

Schedule Overview & Planner

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Task 2 – Create/implement data model & dashboard

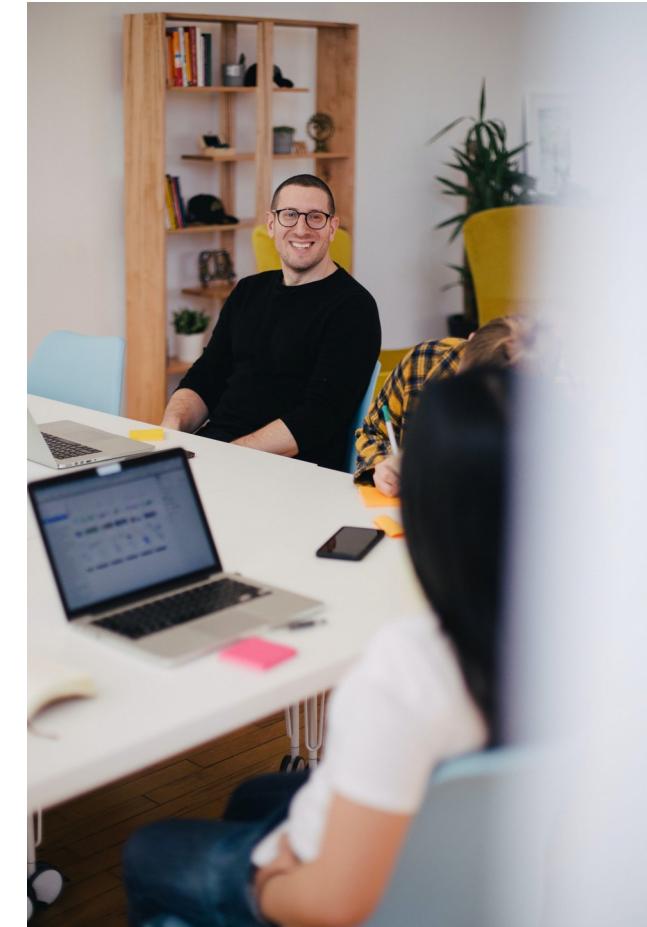
Create/implement a **data model diagram** and **dashboard solution**. There are several free to use web-based diagramming tools that are suitable for the task.

Be sure to include the following in your data model:

- **Visual** of the whole system or parts of it to communicate connections between data points and structures.
- Highlight **relationships** between data services, data sets and tables through connections.
- Identify decisions made that have led to each of the driving questions, customer endpoints, and how data is to be processed and stored inside the system.

Your solution should demonstrate the following:

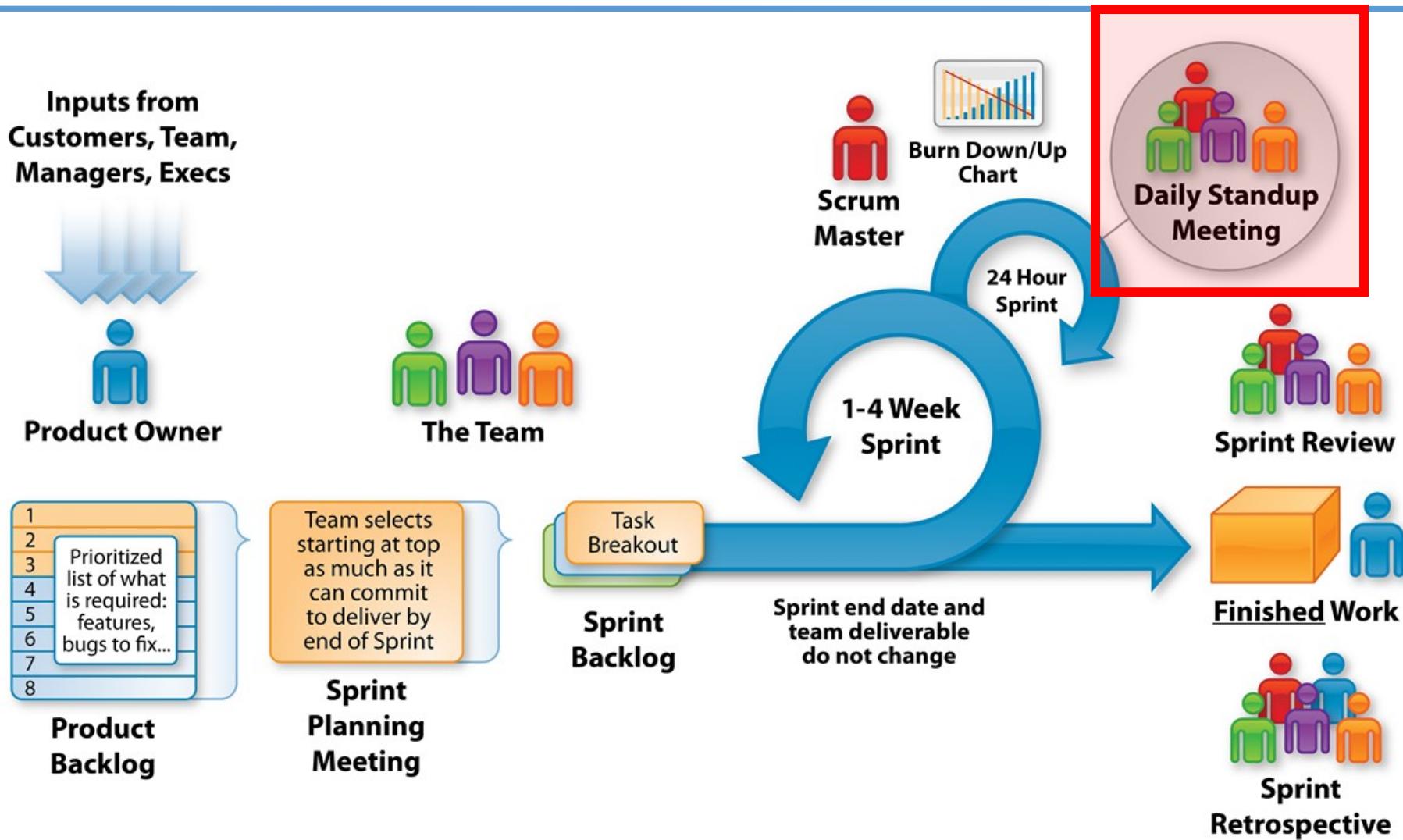
- **Import a dataset** using a data visualisation tool by carrying out clean, transform, and load tasks.
- Visualise a range of **meaningful insights** from the processed data using suitable **queries**.



Task 2: Capstone Rubric

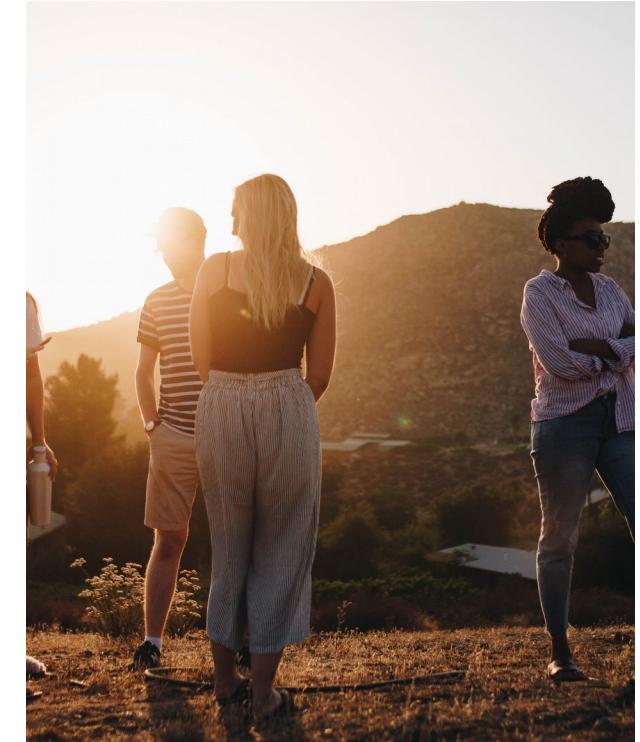
| | Approaches Standard | Meets Standard | Exceeds Standard (includes items in Meets Standard) |
|--|---|--|---|
| Visualise through a diagram a data model | Outline of data model presented | Diagram of data model presented | Including supportive commentary |
| Data model diagram highlight relationships/connection s | Some of the data model evidence interconnectivities but lacks cohesiveness and detail | Data model interconnection and relationships are presented correctly and clearly | Data model interconnection is well-considered and detailed to a good standard |
| Create a dashboard | Dashboard include one tile or only one kind of visualisation or does not relate to the business described | Dashboard includes two or more tiles, with different visualisations, and relates to the business described | Dashboard includes three or more tiles with different visualisations |

Scrum Framework



Reminder: Benefits of Daily Stand-up

- Keeps the workflow on track and helps identify issues sooner than later
- Increases team accountability, communication and collaboration
- Allow the team to see the 'bigger picture' of the sprint and stimulates team self-organisation and personal planning
- Helps team address issues and make corrections, if needed



Three questions: What did I accomplish yesterday? What will I commit to or complete today? What obstacles are preventing me from meeting my commitments?

Daily Stand-up Meeting (Team: _____)

What did we accomplish yesterday/last sprint?

What will we commit to, or complete, today?

What impediments or obstacles are preventing me from meeting commitments?

Scrum Framework

Inputs from
Customers, Team,
Managers, Execs



Product Owner

| | |
|---|--|
| 1 | |
| 2 | |
| 3 | Prioritized list of what is required: features, bugs to fix... |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

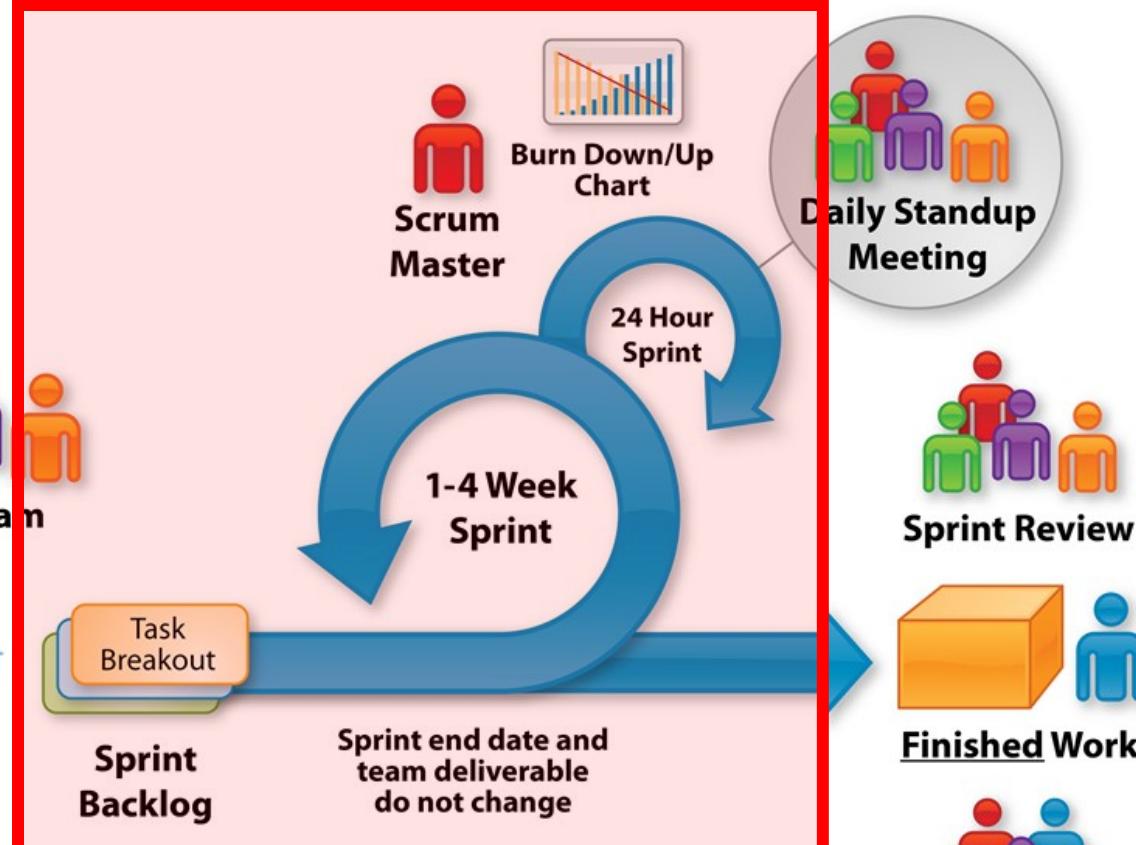
**Product
Backlog**



The Team

Team selects
starting at top
as much as it
can commit
to deliver by
end of Sprint

**Sprint
Planning
Meeting**



**Daily Standup
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Retrospective**

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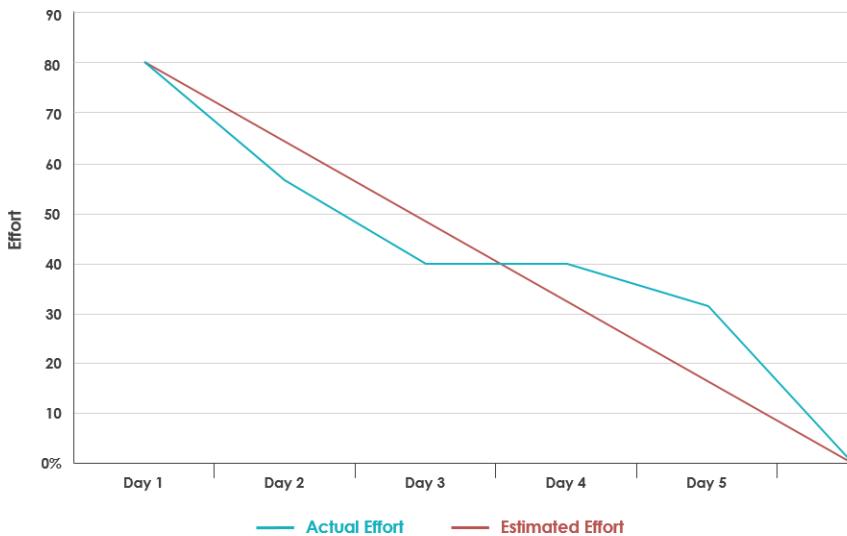


Scrum Master: Track Daily Progress

As you and your team complete tasks, you are also responsible for compiling a **burndown chart** in scrum.

You have until **Tuesday afternoon** to prepare your **burndown chart** and include this as part of your **final presentation** to the rest of the group.

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Schedule Overview & Planner (Summer)

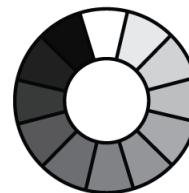
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Colour Harmony

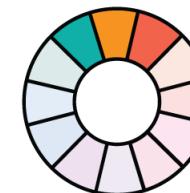
Colour harmony refers to the principle that certain colours, when used in combination, can create visual contrast or cohesion.

As a data practitioner, you should examine how you can use the colour wheel and colour harmony to make smart palette decisions.

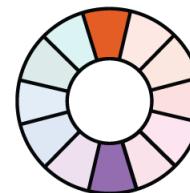
Depending on what kind of story you want to tell with your data, you can use different arrangements to maximize the impact.



Monochromatic



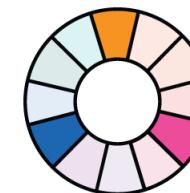
Analogous



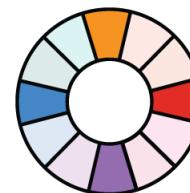
Complementary



Split-Complimentary



Triad



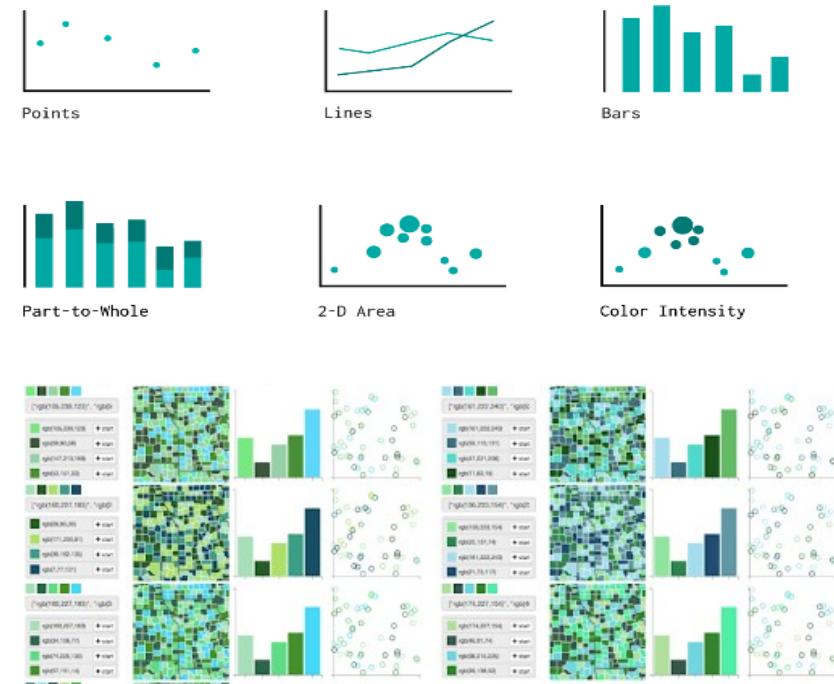
Tetradic

Colour Schemes

Monochromatic palette (one-colour) is best for scenarios where your intention is to suggest data is sequential or varies in degree instead of kind.

Analogous pairings, colours that sit beside each other on the colour wheel, provide a more varied alternative for sequential data visualisation (whilst remaining separate from one another visually). This is helpful in visualising different data points.

Complimentary pairings are counterparts that represent strongest possible contrast. This is an easy shortcut to give perception they are opposing, i.e. 'positive' and 'negative'.



Colour Palette

Qualitative palette is used when a variable is categorical in nature, i.e. distinct labels without ordering. The colours assigned need to be distinct.



Sequential palette when the variable to be coloured is numeric or has inherently ordered values. Colours are assigned to data values in a continuum. Typically lower values are associated with lighter colours, and higher values with darker colours (however on a dark background this is commonly reversed).



Diverging palette if the numeric value has a meaningful central value, like zero, then we can apply. It is essentially combination of two palettes with a shared endpoint. Values larger than the centre are assigned on one side and smaller values assigned to the opposite.



Best practices with Colour

**Accessibili-
ty**

Colour +

**Colour by
Type**

**Semantic
Colours**

**Consisten-
cy**

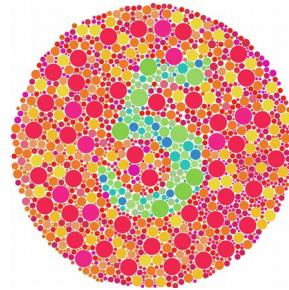
**Palette
Size**

**Colour
Psycholog-
y**

**Colour-
select
Tools**

Always try to consider your colour choices carefully when presenting findings to others, as a good set of colours will make it that much easier to deliver your desired message to your audience.

Accessibility



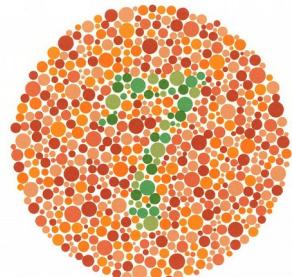
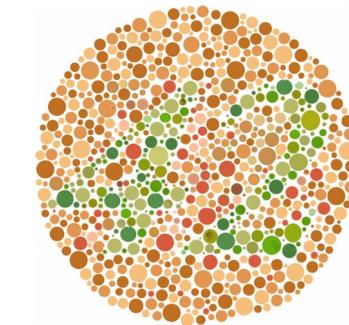
Normal
Vision



Simulated
Deuteranomaly

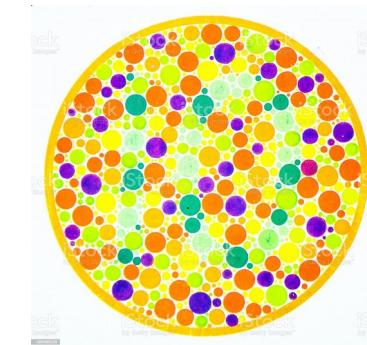


Simulated
Protanopia

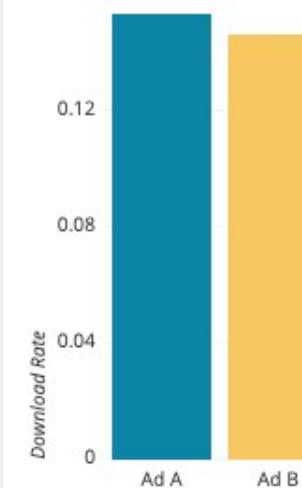
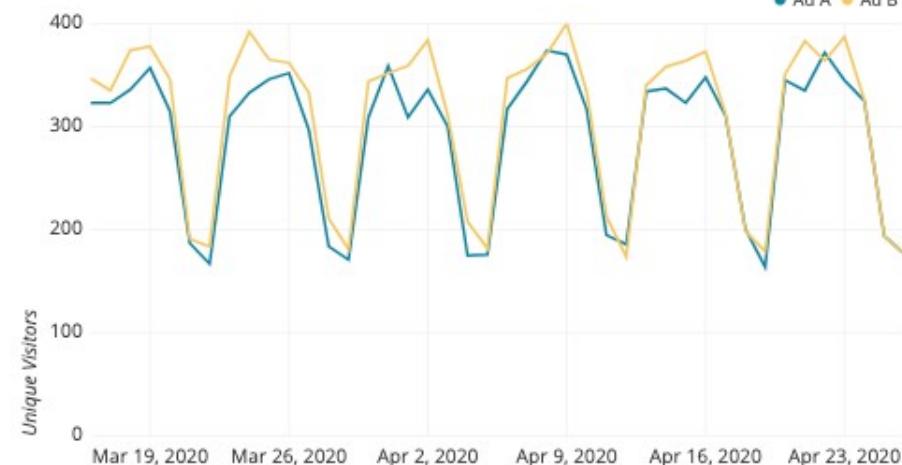
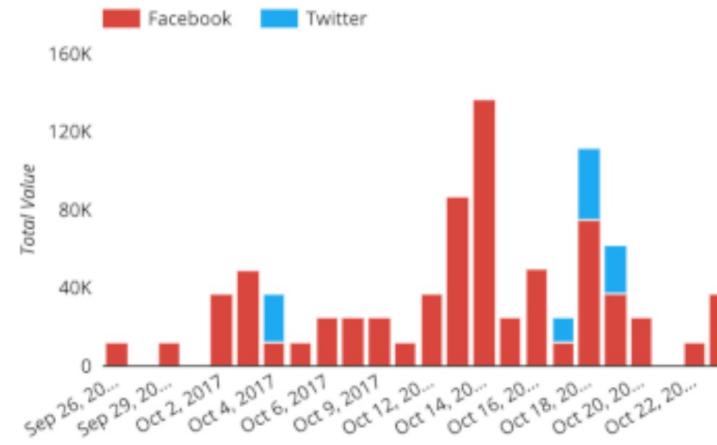
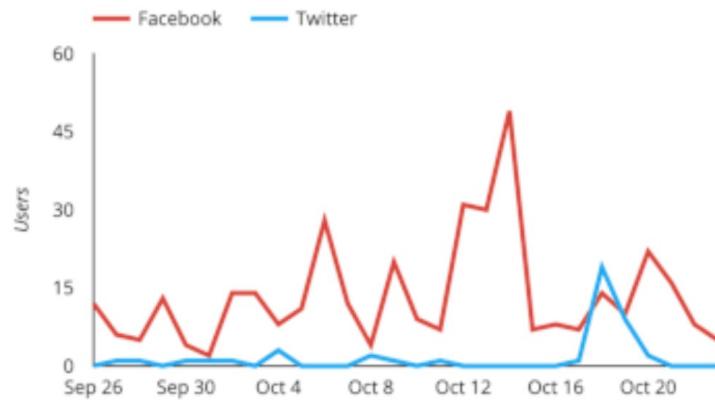


colors as seen
with normal vision

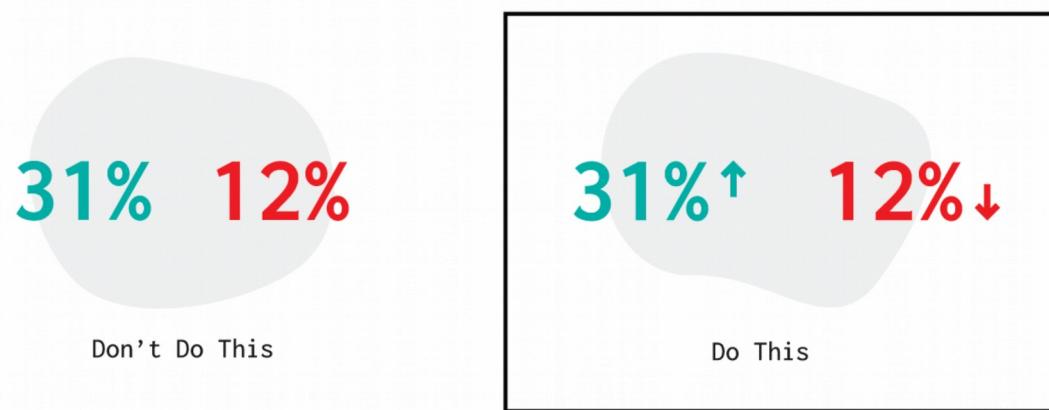
same colors as seen with
red-green color deficiency



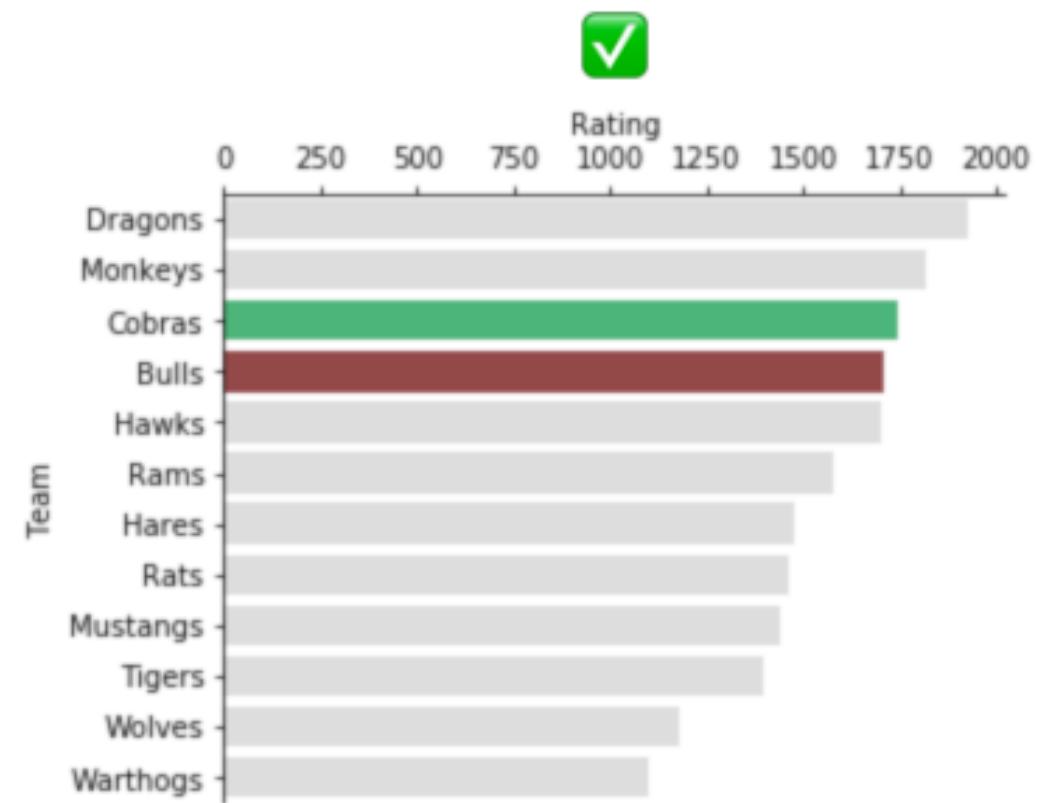
Consistency



Colour +



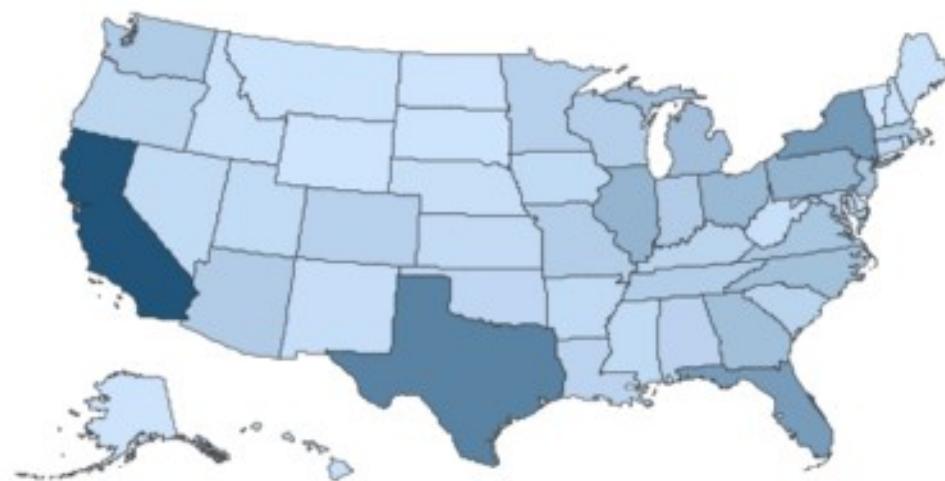
Palette size



Colour by Type

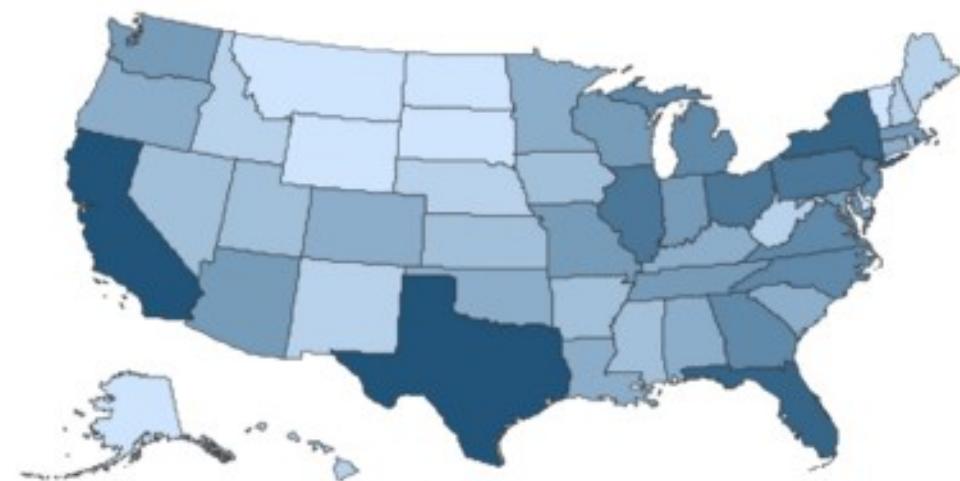
2010 US Population

564K 37.3M

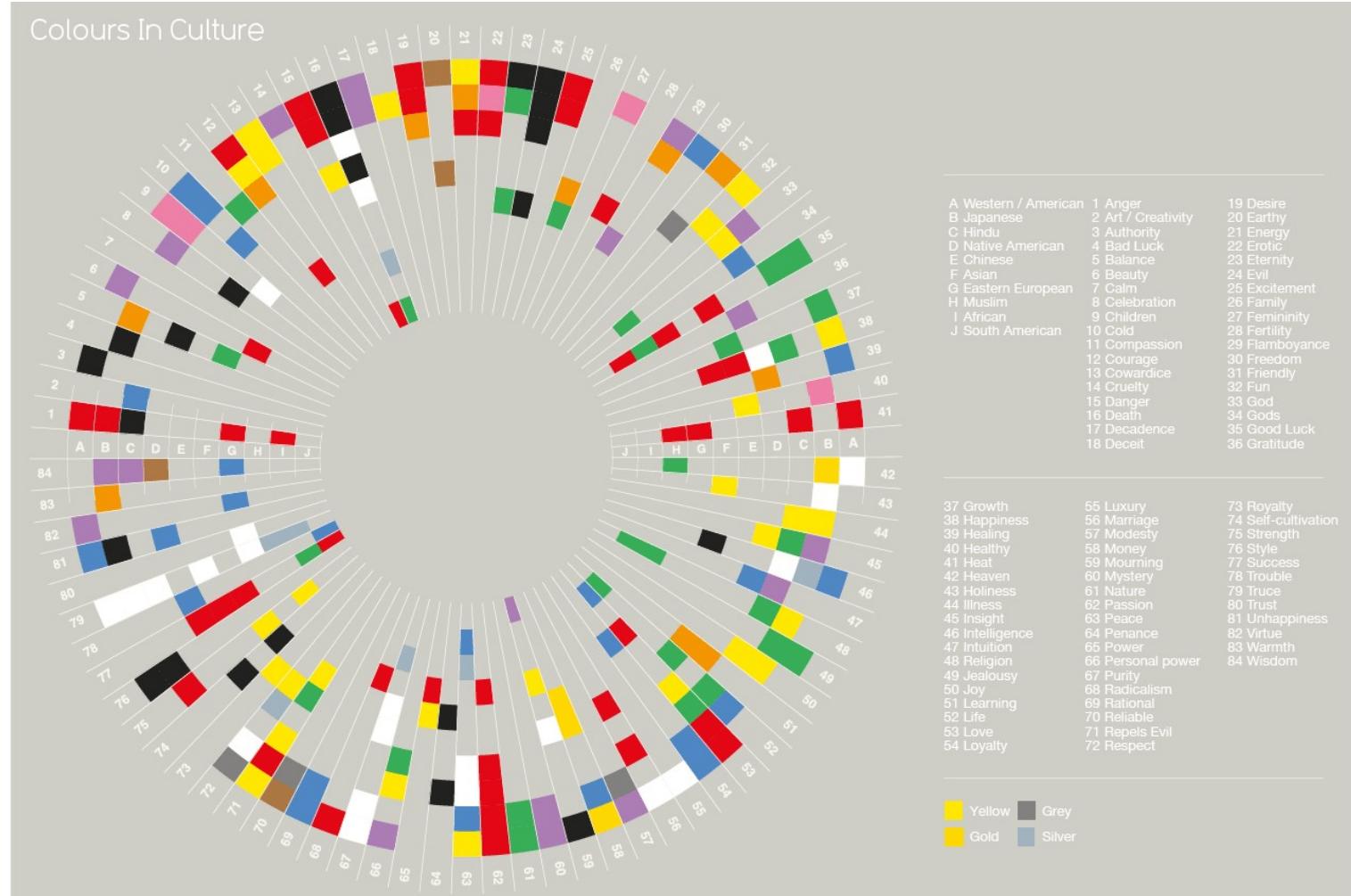


2010 US Population

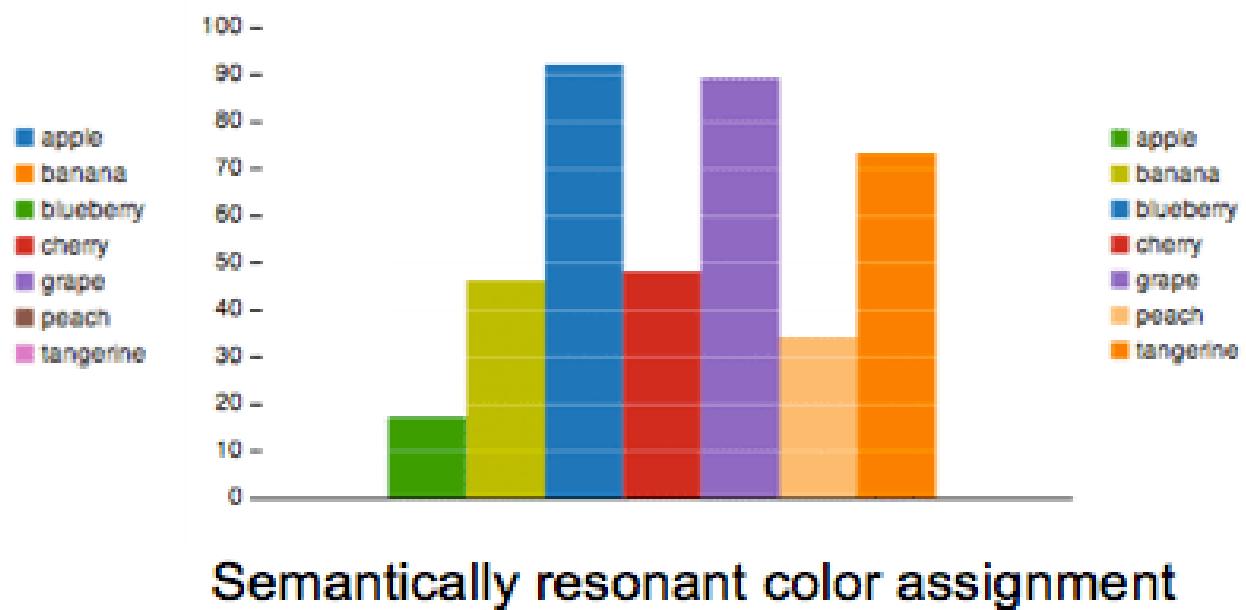
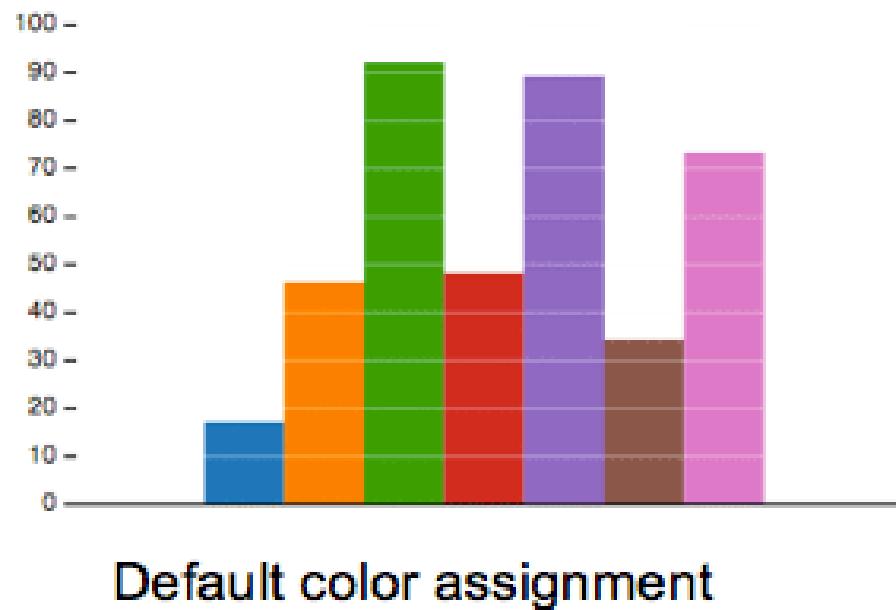
564K 1.1M 2.2M 3.3M 5.5M 7M 10M 15M 20M 37.3M



Colour Psychology



Semantic Colour Associations

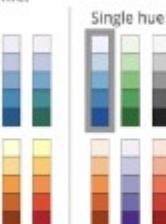


Colour-select Tools

COLORBREWER 2.0
color advice for cartography

Number of data classes: 7

Nature of your data:
 sequential diverging qualitative

Pick a color scheme:
 Multi-hue: 
 Single hue: 

Only show:
 colorblind safe
 print friendly
 photocopy safe

Context:
 roads
 cities
 borders

7-class Blues 

EXPORT

#eff3ff
#c6dbef
#9ecae1
#6baed6

DATA COLOR PICKER powered by LEARN UI DESIGN

COURSE BLOG SUBSCRIBE

PALETTE SINGLE HUE DIVERGENT

VIZ PALETTE By: Elijah Meeks & Susie Lu

PICK

```
#eff3ff, #c6dbef, #9ecae1, #6baed6, #4d81c4, #2e6d9e, #1f4e79
```

Use Chroma.js

Use Colorgorical

Use ColorBrewer

EDIT

7 Colors

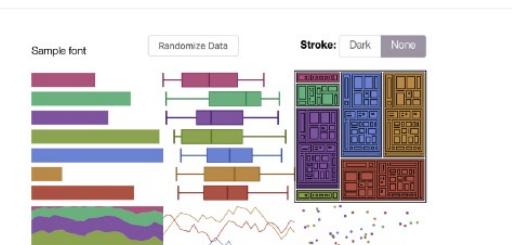
- 1 #eff3ff
- 2 #c6dbef
- 3 #9ecae1
- 4 #6baed6
- 5 #4d81c4
- 6 #2e6d9e
- 7 #1f4e79

hex rgb hsl

COLORS IN ACTION

Color Population:
 No Color Deficiency - 96% Deutanomaly - 2.7% Protanomaly - 0.66% Protanopia - 0.59%
 Deutanopia - 0.56% Greyscale

Sample font Stroke: Dark None



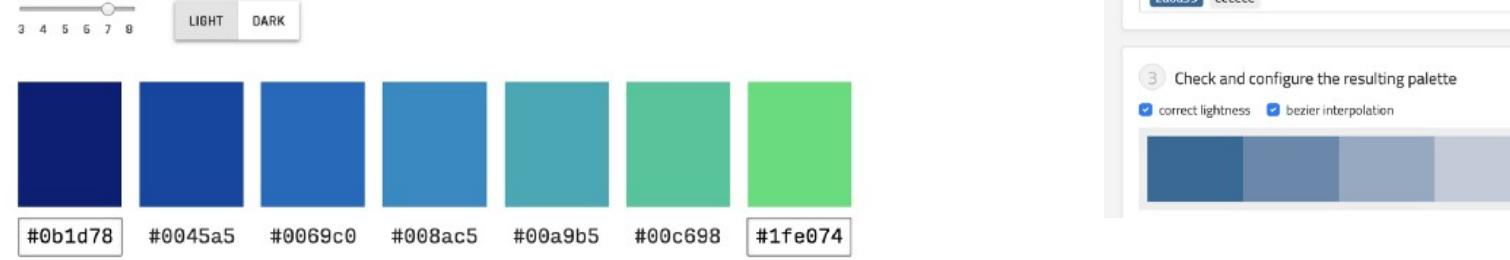
Chroma.js Color Palette Helper

This chroma.js-powered tool is here to help us mastering multi-hued, multi-stops color scales.

1 What kind of palette do you want to create?
 Palette type: sequential diverging Number of colors: 9

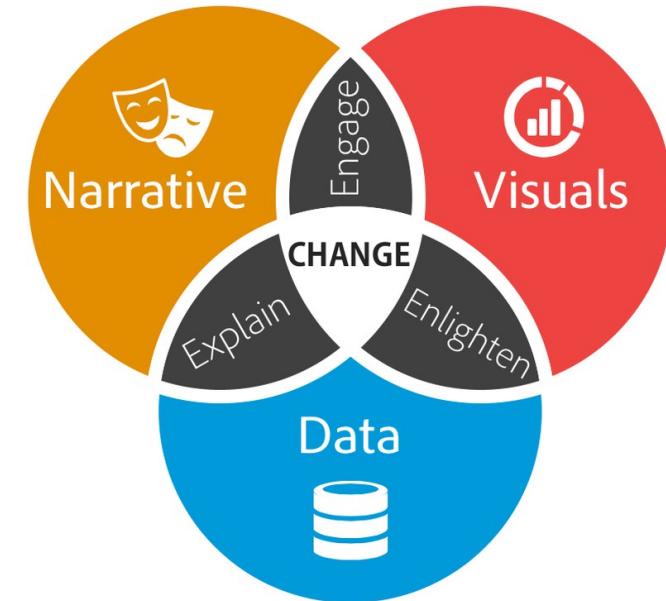
2 Select and arrange input colors
 2a6a99 eeeeeeeeee d8b546

3 Check and configure the resulting palette
 ✓ This palette is colorblind-safe.
 simulate: normal deut. prot. trit.



Moving towards Storytelling

- Data storytelling is the best way to use data to create new knowledge and new decisions or actions.
- Spreadsheets only tell you *what* is happening, but they do not tell you *why*.



Data Storytelling is not a new concept. Companies have been attempting it for many years now and have seen great successes.

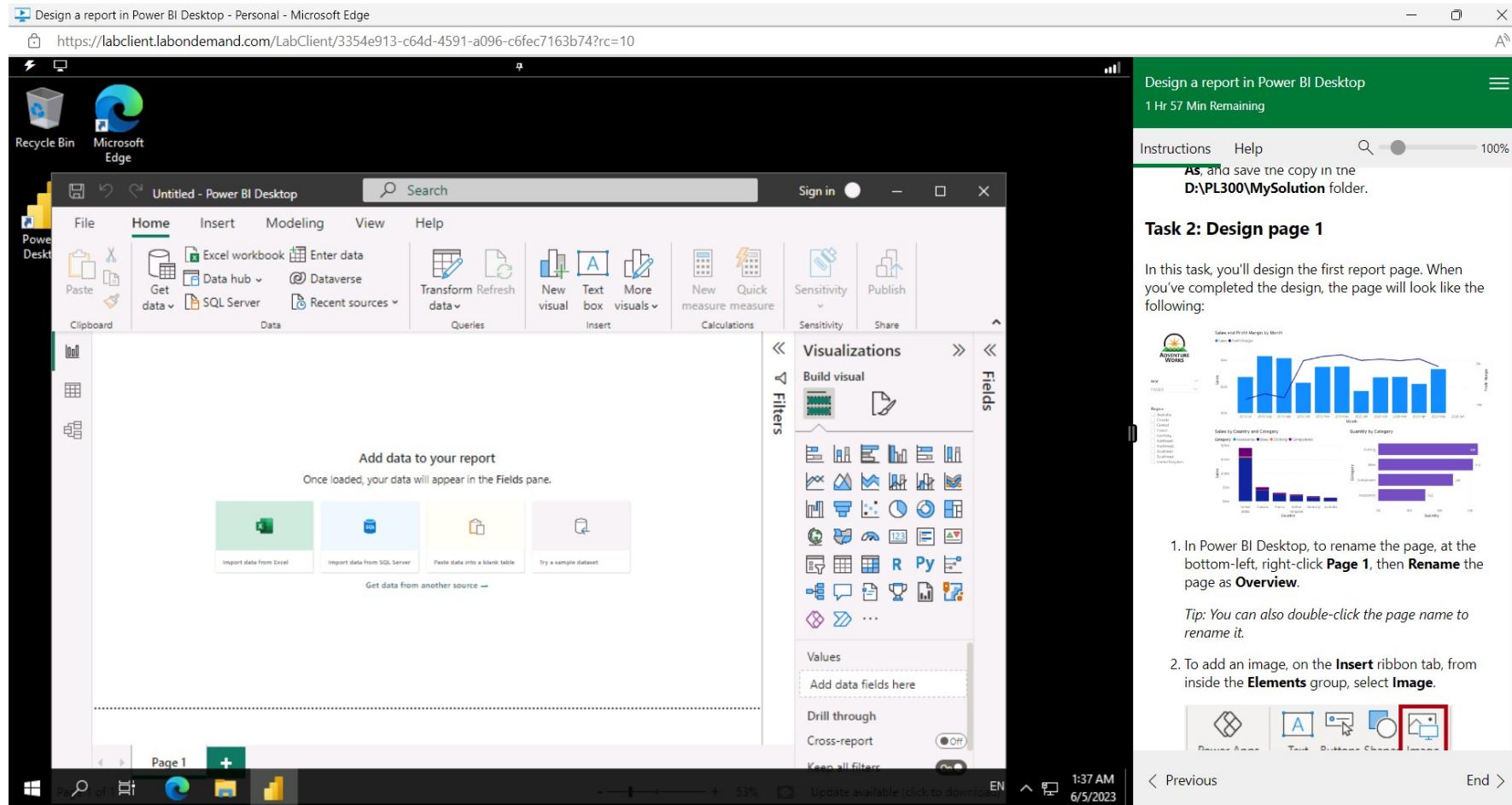
Examples – storytelling works!



Lab 4 Exercise – Reporting data in Power BI Desktop

Design a report in Power BI Desktop - Personal - Microsoft Edge

<https://labclient.labondemand.com/LabClient/3354e913-c64d-4591-a096-c6fec7163b74?rc=10>



Design a report in Power BI Desktop

1 Hr 57 Min Remaining

Instructions Help

As, and save the copy in the D:\PL300\MySolution folder.

Task 2: Design page 1

In this task, you'll design the first report page. When you've completed the design, the page will look like the following:

Sales margin Margin by Month

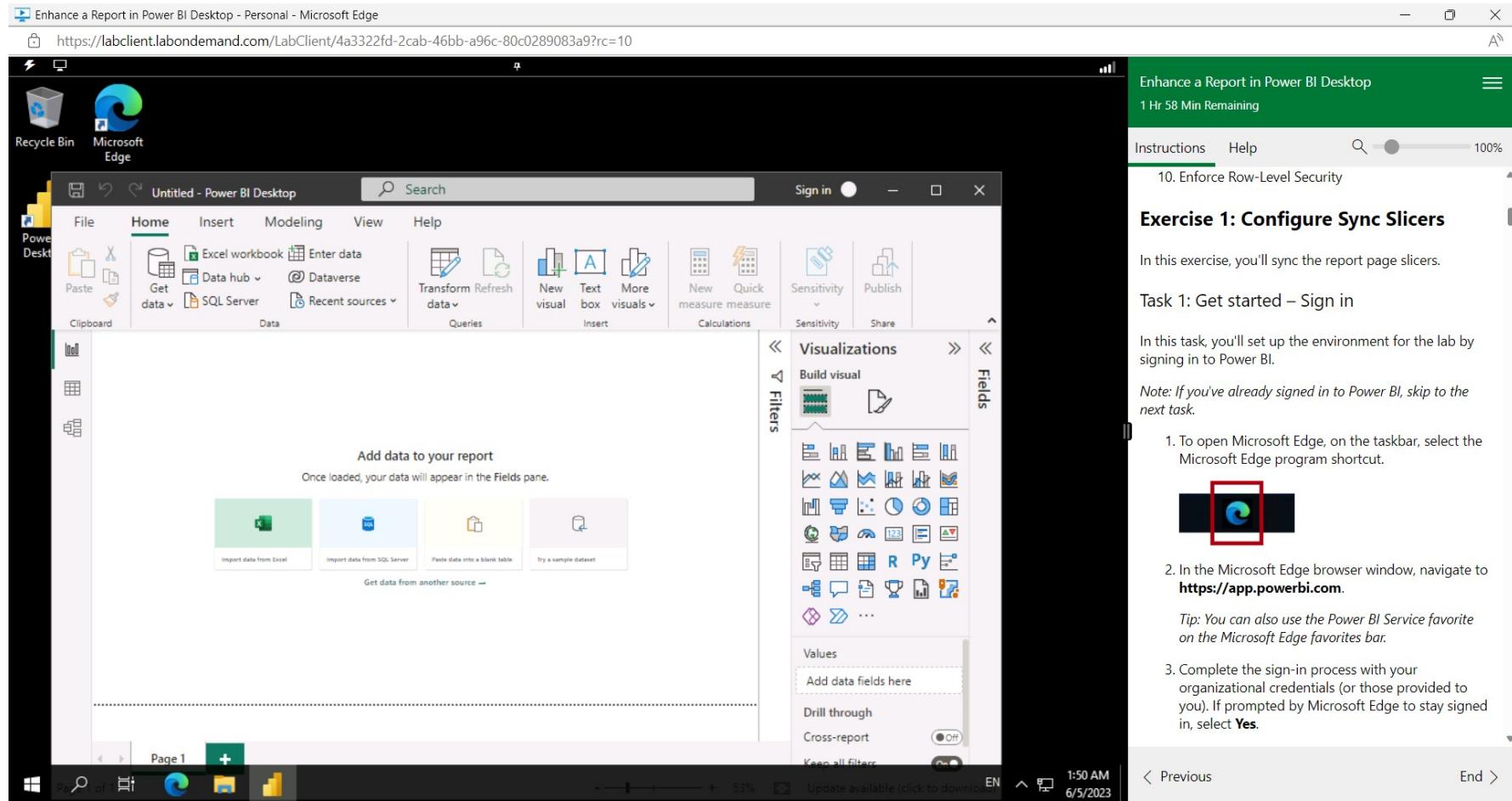
Sales by Country and Category

Quantity by Category

1. In Power BI Desktop, to rename the page, at the bottom-left, right-click **Page 1**, then **Rename** the page as **Overview**.
Tip: You can also double-click the page name to rename it.
2. To add an image, on the **Insert** ribbon tab, from inside the **Elements** group, select **Image**.

Lab - Design
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Lab 5 Exercise – Enhance reports in Power BI Desktop



The screenshot shows the Microsoft Edge browser window with the URL <https://labclient.labondemand.com/LabClient/4a3322fd-2cab-46bb-a96c-80c0289083a9?rc=10>. The page title is "Enhance a Report in Power BI Desktop - Personal - Microsoft Edge". The main content is a lab exercise titled "Enhance a Report in Power BI Desktop" with a duration of "1 Hr 58 Min Remaining". The exercise is divided into sections: "Instructions", "Help", and "Search". The first section, "Exercise 1: Configure Sync Slicers", contains instructions and tasks:

- Task 1: Get started – Sign in**
- Note:** If you've already signed in to Power BI, skip to the next task.
- 1.** To open Microsoft Edge, on the taskbar, select the Microsoft Edge program shortcut. (The Microsoft Edge icon is highlighted with a red box.)
- 2.** In the Microsoft Edge browser window, navigate to <https://app.powerbi.com>.
- Tip:** You can also use the Power BI Service favorite on the Microsoft Edge favorites bar.
- 3.** Complete the sign-in process with your organizational credentials (or those provided to you). If prompted by Microsoft Edge to stay signed in, select **Yes**.

The Power BI Desktop application window is visible in the background, showing the "Home" tab selected. The interface includes a ribbon menu, a central workspace with a message "Add data to your report", and various data import and visualization tools.

Lab - Enhance Power BI reports with slicers, interaction, and formatting - Training | Microsoft Learn

Schedule Overview & Planner

| | | Monday | Tuesday | Wednesday | Thursday |
|--------|----|--|---|---|--|
| WEEK 1 | AM | Data Terms and Jargon Busting Workshop | Individual Contributions and Team Selection | Sprint A: Task 1 Proposal | PowerBi Workshop |
| | PM | London Datastore Capstone Project launch | Introduction to Agile Teams Methodology + Guest Speaker | Task 1 Group Presentation | Data Modelling Workshop |
| WEEK 2 | AM | Sprint B: Task 2 Creation | Sprint B: Task 2 Creation | Sprint C: Task 3 Prepare Presentation | Final Solution Presentation |
| | PM | Sprint B: Task 2 Creation | Data Storytelling Workshop | Using Raw Data in Industry/Sector + Guest Speaker | Self-Reflection and Project Wrap-Up Workshop |

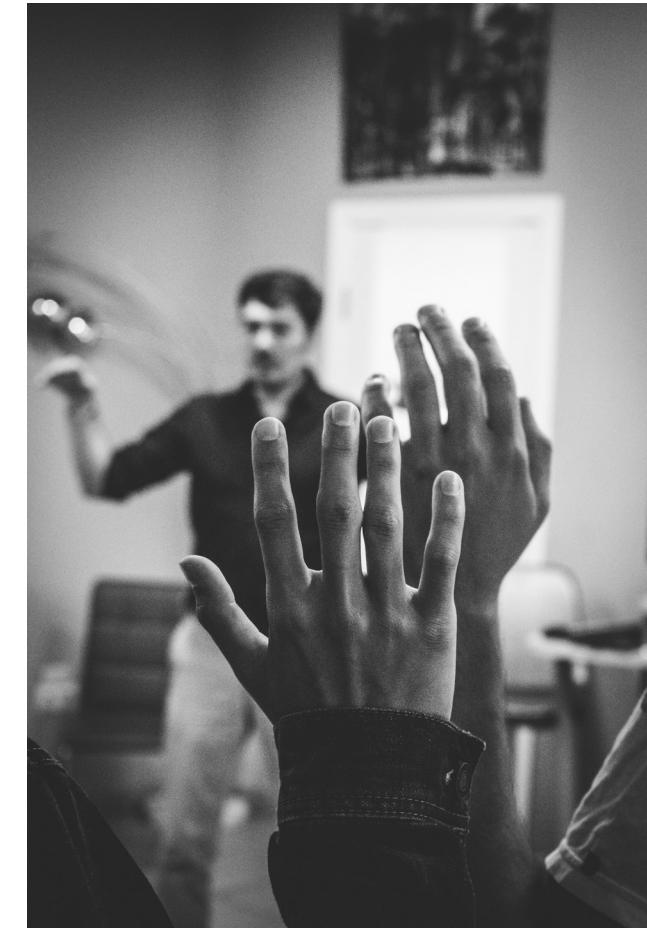
Task 3 – Present data solution

Present the data solution utilising your choice of data visualisation tools.

In this phase, you will deliver a **fifteen-minute presentation** that **showcases your final dashboard**. You should take the opportunity to share with your peers **how you did this** – both in terms of strategy and how this came together visually.

After the presentation, you will take the opportunity to reflect on how your group came together. What went well, what did not, what would you do differently in future? Others will have an opportunity to ask you questions about your process and recommendations.

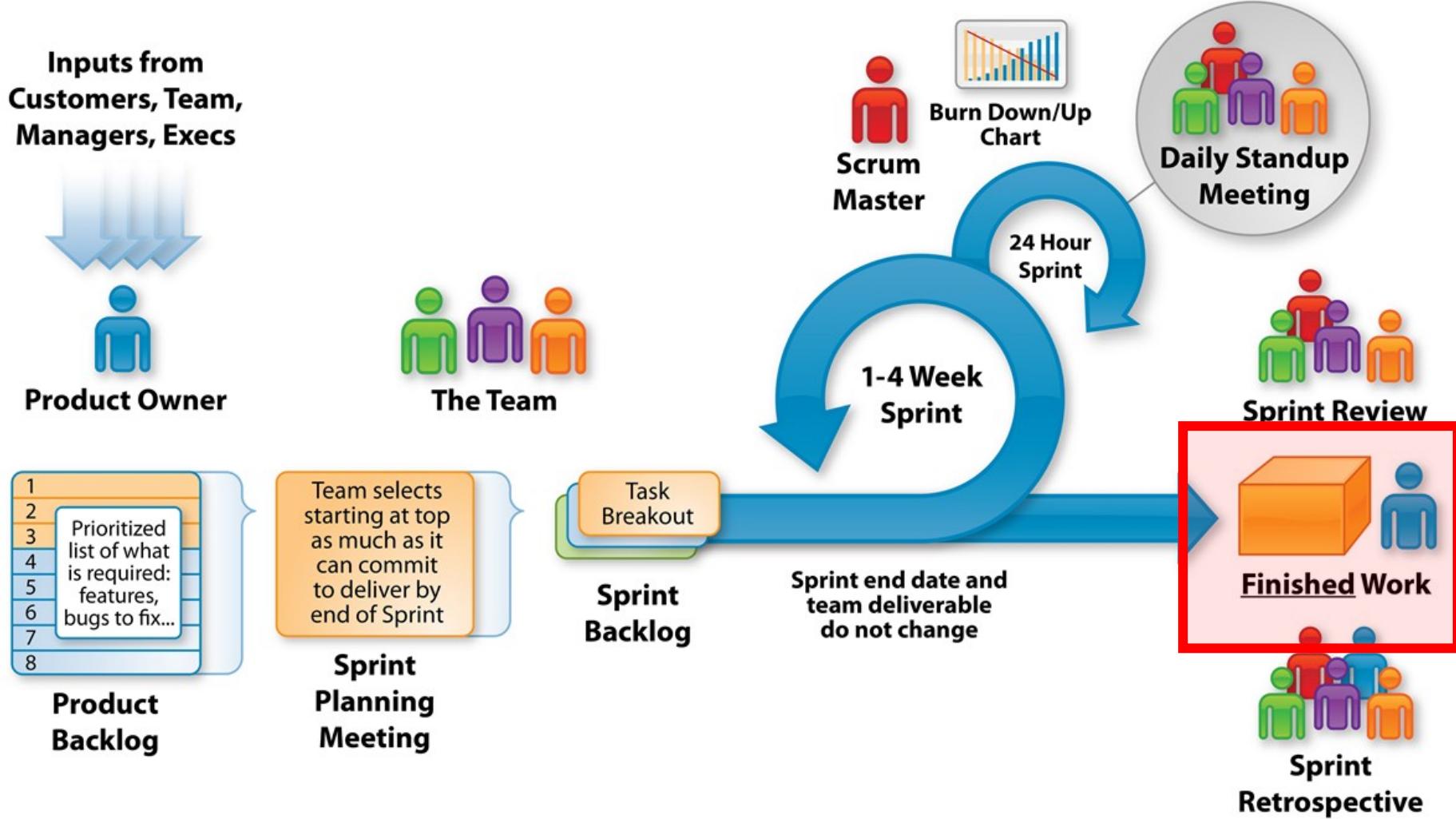
Make sure you include clear **evidence to support decisions** made, and that your **presentation is organised** and detailed enough for your audience to have a good understanding of the **benefits of your recommendations**. If you wish, your presentation should also **include an additional communications item** (e.g. poster, handout, guide/leaflet, presentation, tutorial, blog, vlog) to demonstrate **how the dashboard is expected to be used by users**.



Task 3: Capstone Rubric

| | Approaches Standard | Meets Standard | Exceeds Standard (includes items in Meets Standard) |
|---------------------------------------|--|---|---|
| Presenter aids | Presenter does not describe how the data solution can add value to the client business | Presenter describes several aspects of the data solution, referencing the architecture diagram, and explains how the solution adds value to the client business | Presenter describes a flow, dashboard, and as part of data solution, referencing each in the architecture diagram and explaining how the work together to add value to the business |
| Presentation aids | Not all materials are organised or easy to understand. Not all visual and/or audio elements help audience understanding, some might distract | Materials are organised and clear. Visual or audio elements help audience understanding | Materials are interesting, easy to understand, and include at least one way to gather audience responses beyond just asking if there are any questions |
| Delivery of presentation | Presenter isn't prepared or doesn't engage with the audience | Presenter is prepared and engaged with the presentation and the audience. Communication of ideas is mostly clear and effective | Presenter communicates beyond just reading the words on the presentation materials. Communication of ideas is consistently clear and effective |
| Quality of communications item | Not all materials are organised or easy to understand. | Materials are organised and clear. | Materials are interesting, easy to understand. |

Scrum Framework

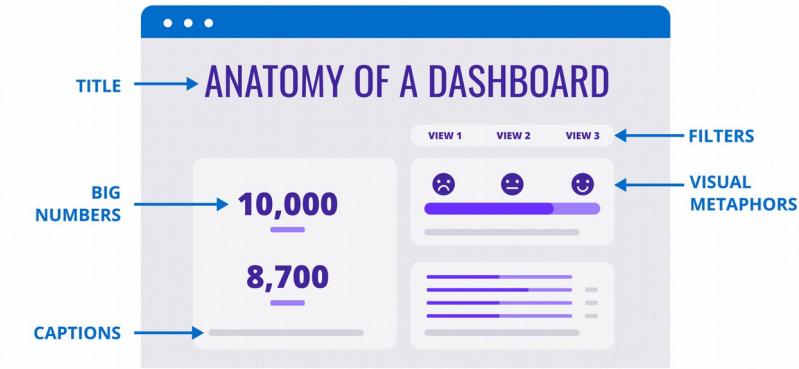


Tips: Final Dashboard Presentation

How you choose to present your dashboard in the final presentation is **up to your team**.

In practice though you will often be asked questions and will want to consider the following:

- The **anatomy of your dashboard** presentation
- **Metrics selected** and justification of your choices
- An overview of **how you created** your final dashboard


SLIDEMODEL.COM

SLIDEMODEL.COM

Activity: Final solution presentation

You have until
Thursday lunch to
prepare your **final
solution (dashboard)**
and **presentation**.



Guest Speaker

JONATHAN BELSEY

- Medical advisor and Head of Clinical Development background, for the last 25 years working as a Health Economist
- Owner of JB Medical Limited specialising in clinical trial data and development of health economic models to inform purchasing decision-making
- “Scientist that uses data” with specialities in population needs and data queries of NHS databases

[LinkedIn](#)

Task 3 w/Final Solution and Presentation



Schedule Overview & Planner (Summer)

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Benefits of Data Science Projects in Practice

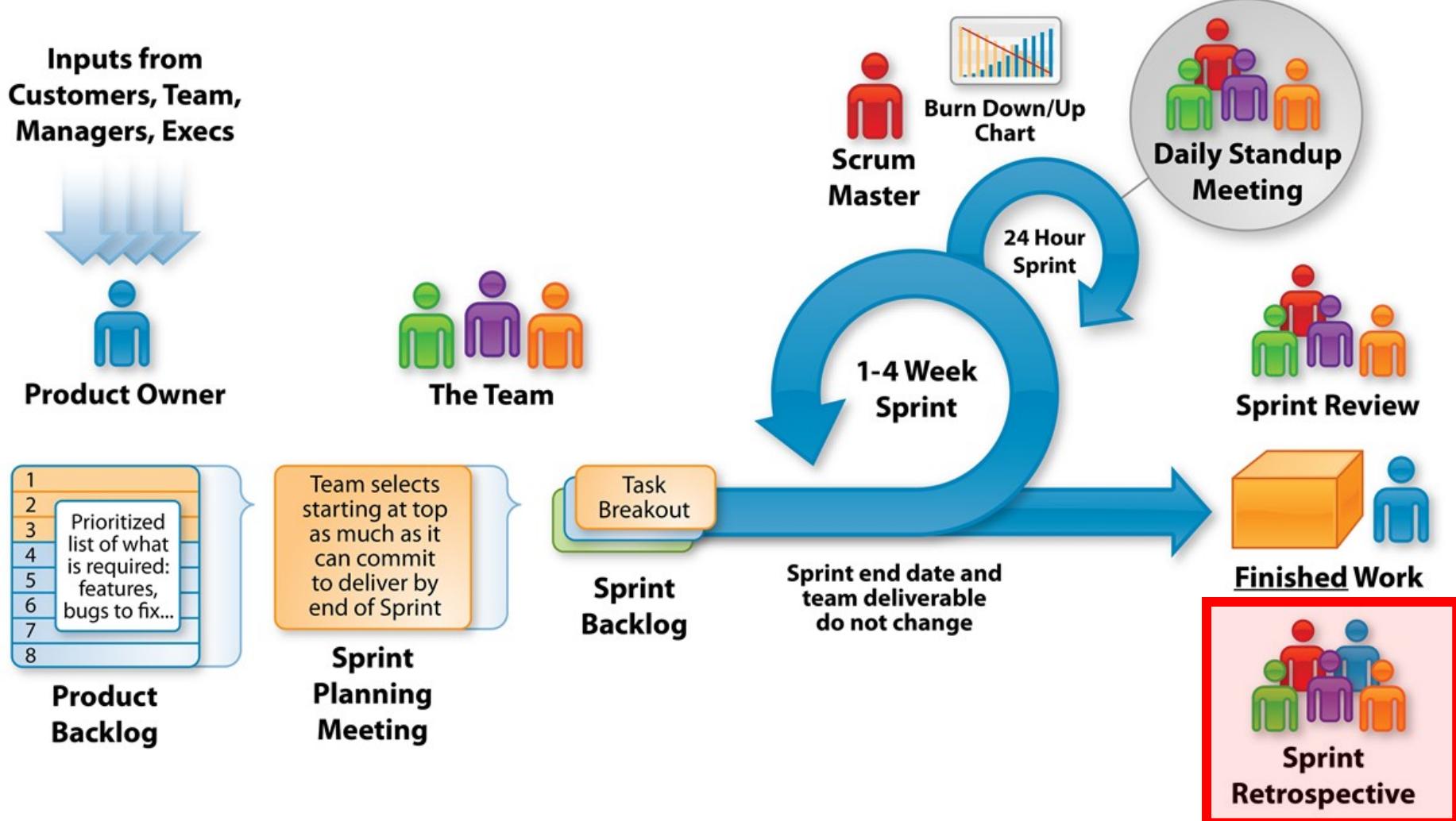
Students can face endless problems while working on a project, but only **constant practice** and learning can help them **solve these problems**. Good communication and **intrinsic rewards** drive success.

You can learn all the knowledge from a subject, but eventually what matters is **how we implement** this. Projects give us **freedom to experiment** and **flexibility to use own learning styles** to solve problems.



Remember experience makes you more marketable, grow as a professional, and teaches you patience when working with teams (even through failure!)

Scrum Framework



Sprint Retrospective

The sprint retrospective **concludes** the sprint. It is **timeboxed** to 60 minutes and is a **detailed inspection** of the team's work.

This is **led by the Scrum Master** and looks to encourage the team to **improve its process** and practices to make it **more effective** and enjoyable next time. By the end you should have **identified improvements**.



Three questions: What went well in the sprint? What could be improved? What will we commit to improve in the next sprint?

Share Conclusions: Sprint Retrospective



Activity: End of Project Reflection

Article and/or Blog (Prompt Questions)

1. Consider your skills at the start of the project and now at the end – how has the project supported your skills development journey?
2. What are three take-aways that you can use moving forward in your career?
3. What was your most surprised learning experience/activity completed? Why?

Where to upload? You can write your article (min. 500 words) on your own website, send via email or connect via LinkedIn. Feel free to add screenshots of your dashboard and include notes from your final presentation.

Recommended reading

Ghandi, P., Bhatia, S. and Dev, K. (2021) *Data Driven Decision Making using Analytics*. Abingdon, Oxon: CRC Press.

Malviya, A. and Malmgren, M. (2018) *Big Data for Managers: Creating Value*. New York: Routledge.

O'Keefe, K. and O'Brien, D. (2018) *Ethical Data and Information Management: Concepts, Tools and Methods*. London: Kogan Page.

Subramaniam, M. (2022) *The Future of Competitive Strategy: Unleashing the Power of Data and Digital Ecosystems*. Boston: MIT Press.

DANKE!

THANK YOU!

MERCI!

GRAZIE!

GRACIAS!

DANK JE WEL!

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