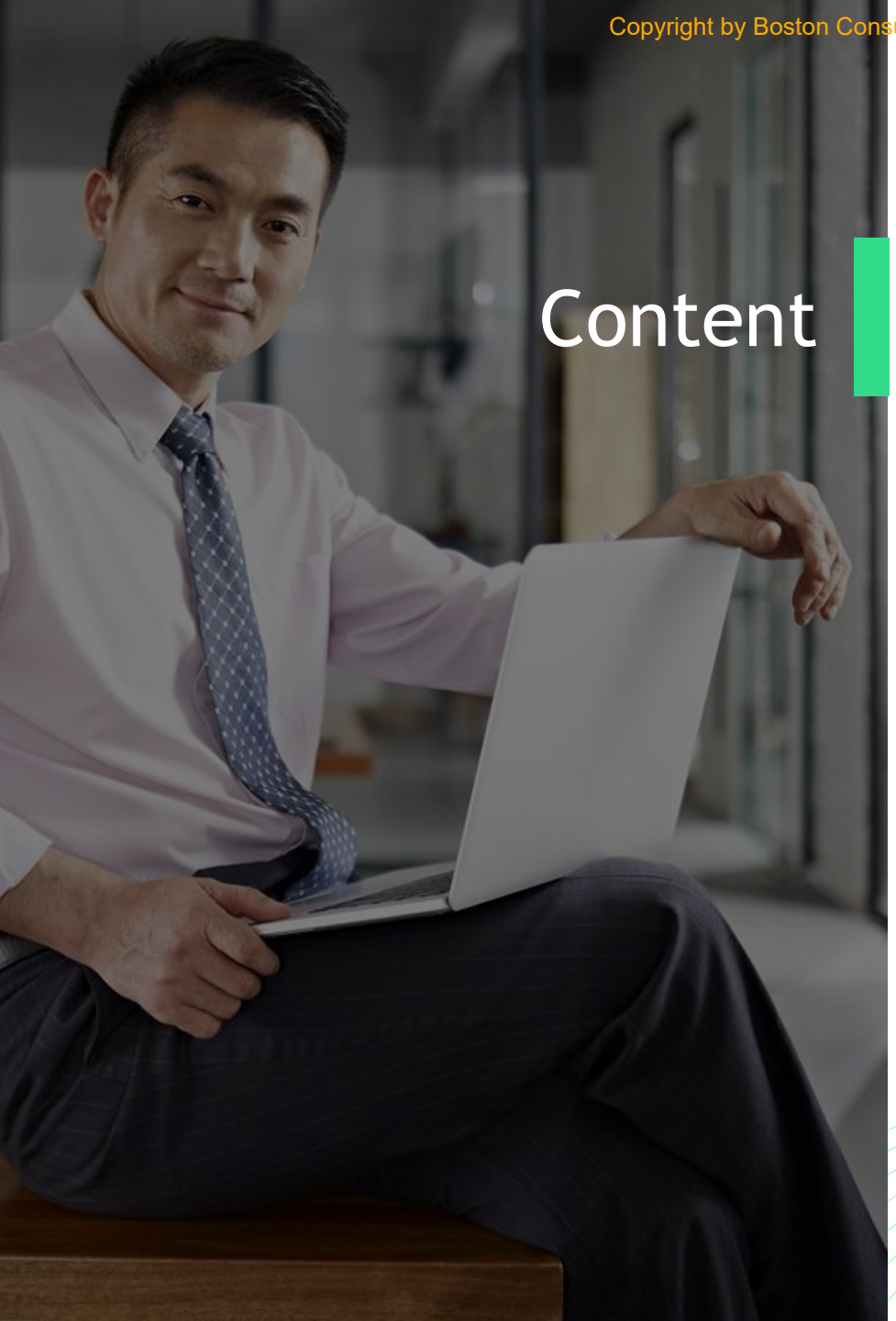
RISE BY DIGITALBCG ACADEMY

IU 4.4 – Visualization and Dashboards

Mini Project

2021

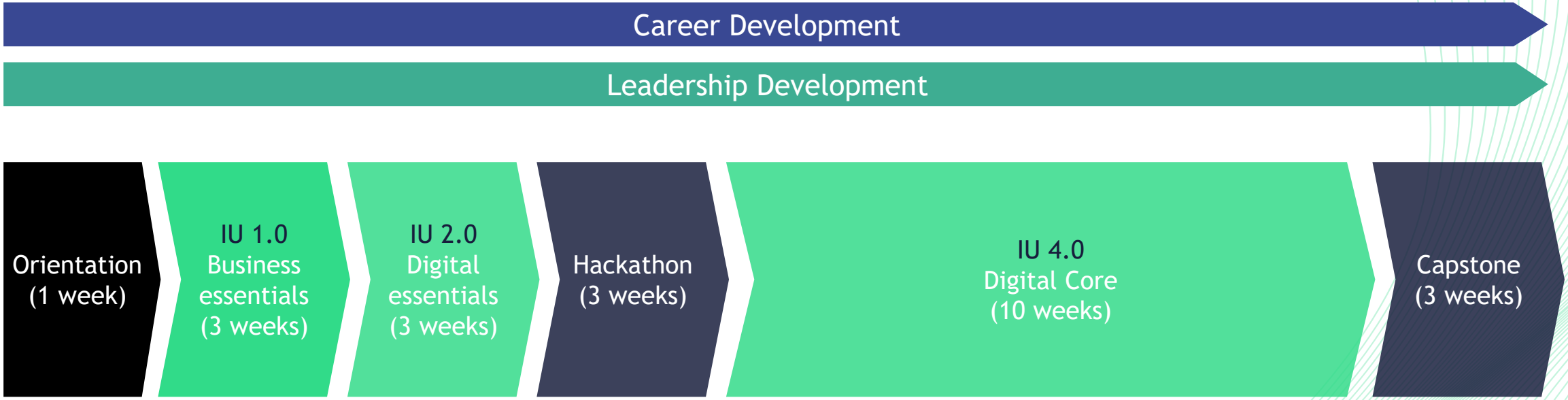


Content

120 min

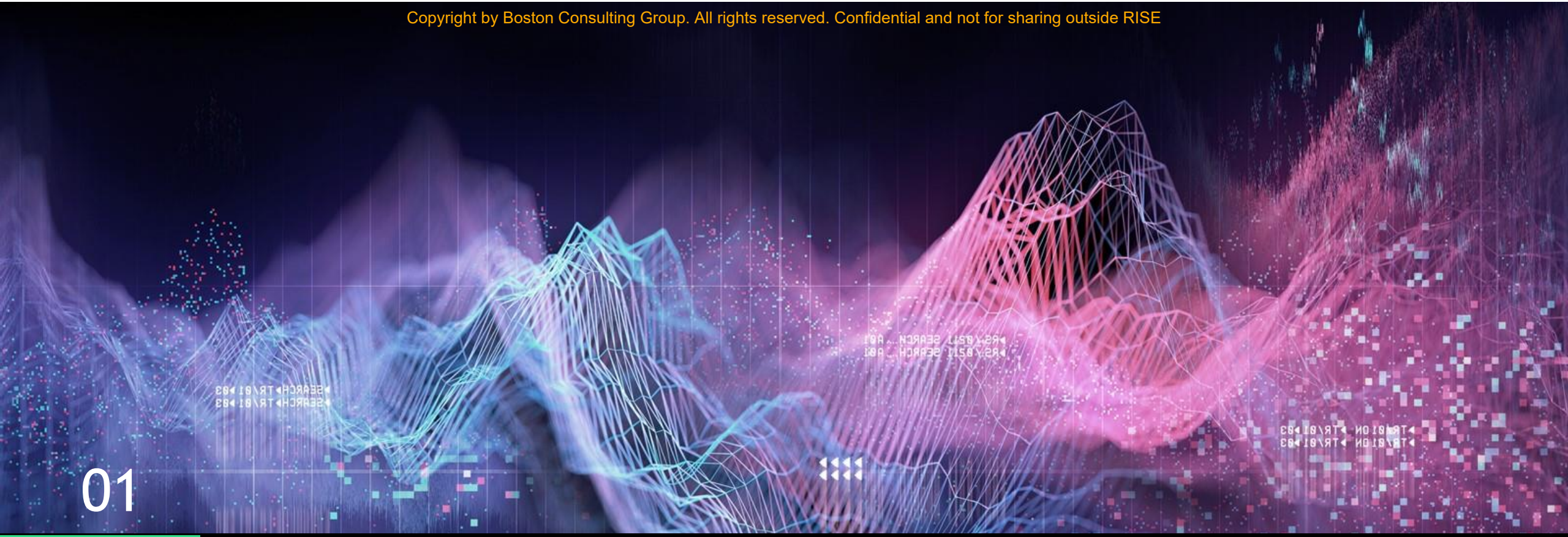
Where Are We in the Journey & Learning Objectives	5 min
Agenda for Today	
• Mini Project: Introduction to problem statement	30 min
• Q&A	20 min
• Group activity to solve the project	60 min
Wrap up	5 min

Where are we in the learning journey?



Learning objectives

- Learn about how to use Power query in Power BI to create new features for analysis
- Learn to create various graphical charts and making a storyboard/dashboard out of it



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Mini Project: Introduction to the problem statement

Introduction – Global Automotive Seating Company

- Major supplier of seating systems for automobiles across the world with 200+ seat manufacturing plants in 30+ countries
- 25 million cars equipped annually

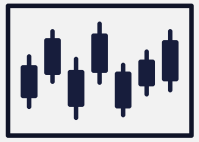
Business Problem

The automotive seating manufacturing company profits have been declining over time because of the steep increase in plants operating costs

Lack of visibility in the production process such as machine downtime, products defect rate, etc. is leading to ineffective operational process in turn increasing costs

Project objectives

Business Objective: Incorporate real time diagnostics of plant operational process to better manage available production lines and increase profit margin



Use data and analytics to track production process of various machines in real time to provide better visibility of the seat manufacturing process

Analytics Objective

Build an analytics dashboard to track plant's operational process i.e., downtime minutes, total machine utilization time, etc.

Major KPIs to track plant's operational process

For reference

#	KPI/Metrics Name	Description
1	Machine Utilization	Helps engineers in understanding idle time of machines to maximize on the total production time
2	Right First Time	Helps in identifying machines that are taking multiple iterations to get the final product. Machines getting the product right on the first attempts should be utilized more and those with lower right first time rate should be diagnosed
3	Scrap rate	Machines generally should produce more of the final product and less of any scrap pieces which takes effort and further cost to process
4	Downtime minutes	Helps engineers in identifying machines that are prone to failure and need maintenance
5	Rework rate	Helps in identifying which products and machines need more reworks on the final products in turn slowing down the total production rate leading to high cost
6	Production pieces	Total produced pieces of the machine vs the expected total production. Helps in identifying which machines have been working at full capacity and producing high quality final products

What is provided?

Production process data provided for a week across three product lines

Data Sources	Data Source Description
DB_Downtime	Details of line downtime such as duration of downtime, type of product line, etc.
DB_Machine Utilization	Details about line's total production in a day and how it compares with the theoretical production capacity
DB_Production	Details about products production data and quantity various lines
DB_Right First Time	Details about total number of pieces produced and how many had to be reworked or scrapped

Data dictionary provided along-with data sets

Group activity | Assignment

Exercise using Power BI

Work plan

Estimated time to complete: 3-4 hours

Create a visualization dashboard to track important KPIs of the plant's operational process

1. Calculate the below listed KPIs(measures) using DAX *[45 - 60 mins] [Marks: 30]*

KPI Name	KPI Calculation
Machine Utilization	(ProductionFBE – Scrap FBE) / ProductionFBE Theoretical
Right first time	*(ProductionFBE - ScrapFBE - ReworkFBE) / ProductionFBE*
Scrap rate	ScrapFBE / ProductionFBE
Rework rate	ReworkFBE / ProductionFBE
Downtime minutes	Sum of downtime value (in secs)
Production pieces	Count of total items produced

2. Create charts to track the overall trend of the above calculated metrics over the given time period. Also, create a KPI card highlighting the overall values for each KPIs across the given time period in the data *[90 - 120 mins] [Marks: 50]*

3. Create list of filters at top of the dashboard to filter for the above designed metrics tracker *[20 - 40 mins] [Marks: 20]*
   I. Line ID
   II. Team ID
   III. Date

4. Bonus Question: Is there a correlation between (i) total production and scrap pieces produced, (ii) total production and rework pieces? What is the magnitude of correlation? *[25 - 40 mins]*

Recap: Power BI topics that you will need to use

- Use Power Query and DAX to merge various data sets together
- Create new columns/ calculated field in Power BI using pre-existing columns and formulae
- Create charts to analyze data i.e., scatter plot, line chart, KPIs, etc.
- Adding images, filters, scroll bars in the dashboard to make dynamic visualizations

Sample dashboard template

Use as reference

Dashboard Banner (provide a name to your dashboard)

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Place your **filters** here
Types of filter that can be used – drop down, multiple check box, scroll bar, etc.

KPI XX%	**Chart** to analyze machine utilization rate over time for all product lines
KPI YY%	**Chart** to analyze Right First-Time rate over time for all product lines

Continue the banners and chart for all other metrics

Scroll Bar

Guidelines on submitting mini project solution

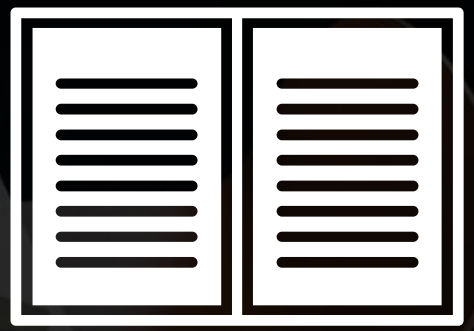
1) Work during the live class with your respective groups to brainstorm ideas and solve analytics objectives based on the work plan provided; Divide tasks within the group where possible

2) Each member in the team to submit their final Power BI dashboard via LMS. One member from the group to submit the solution via Microsoft Teams as well, specifying the group number

3) Final solution submission must be done during the final work and submission session

4) Grading will be done across - (i) Submission: 40% (ii) Concepts applied: 40% (based on marks) (iii) Aesthetics of dashboard: 20%

5) Digital badges to be assigned to top two teams based on grades



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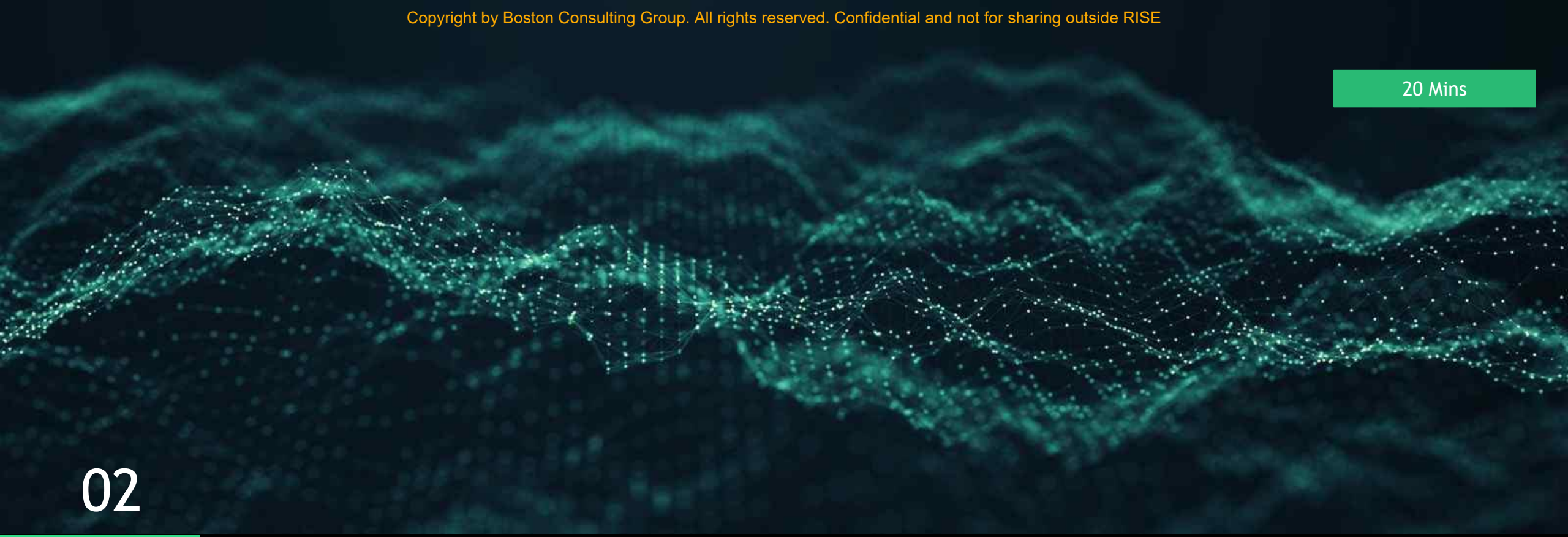

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Questions?

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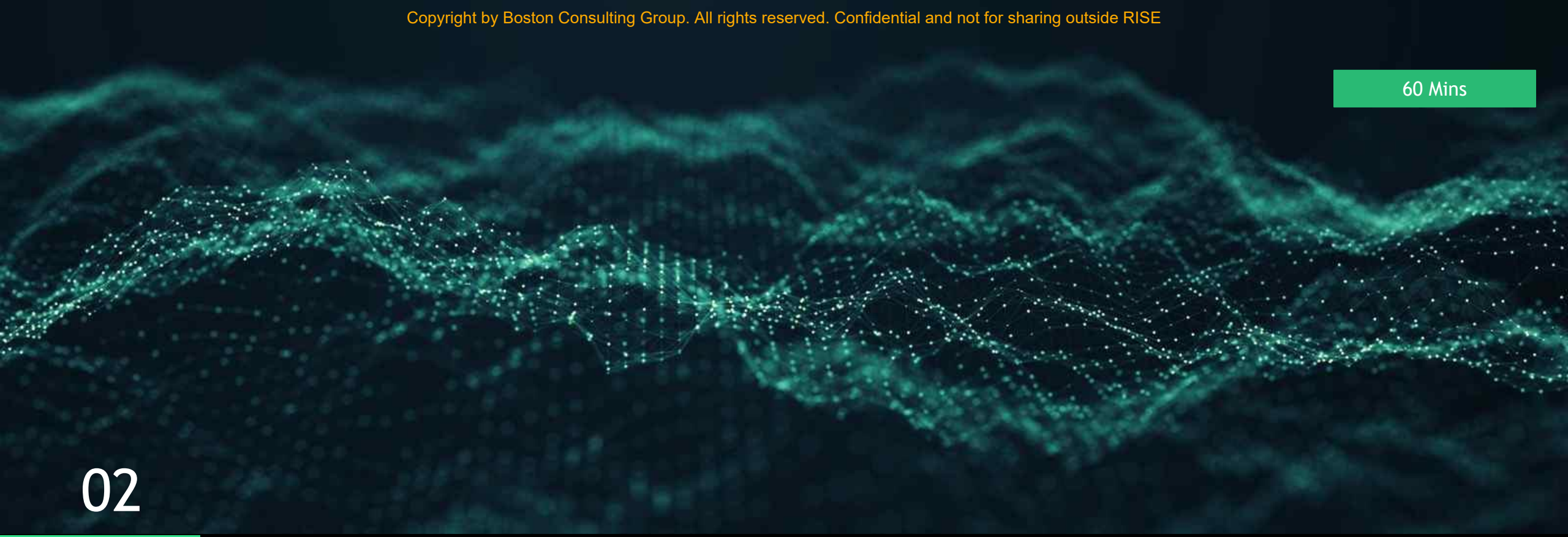

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Working session - Group activity

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