Driving K12 Operational Efficiency with Data Science & AI

Educate Texas
AI + Education Leadership Collaborative

Elevant Strategies
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Elevant Strategies Leadership
Our Expertise is Data Science & AI

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Our mission is to **educate** and **empower** organizations to navigate data science & AI strategically, effectively, and responsibly.

Breakout Session Agenda

1. Welcome and Ice Breaker

2. Data Science & AI for K12 Operational Efficiency

3. Framework: Driving Operational Efficiency with Data Science & AI

4. Small Group Activity

5. Q&A

Welcome & Ice Breaker

WELCOME TO BREAKOUT #2
OVERVIEW & OBJECTIVES

Overview:

This session guides executive leaders in identifying and evaluating specific data science & AI opportunities for K12 operational efficiency. Using a practical framework, participants will engage in focused discussions to pinpoint pressing operational challenges, brainstorm solutions, and define tangible measures of success for their institutions.

Objectives:

Upon completion of this session, participants will be able to:

1. Identify high-impact operational challenges within their K12 institutions.
2. Utilize a basic framework to evaluate and navigate potential data science & AI solutions within their specific organizational context.
3. Begin to articulate tangible and measurable indicators of success for data science & AI implementation in their K12 operational processes.
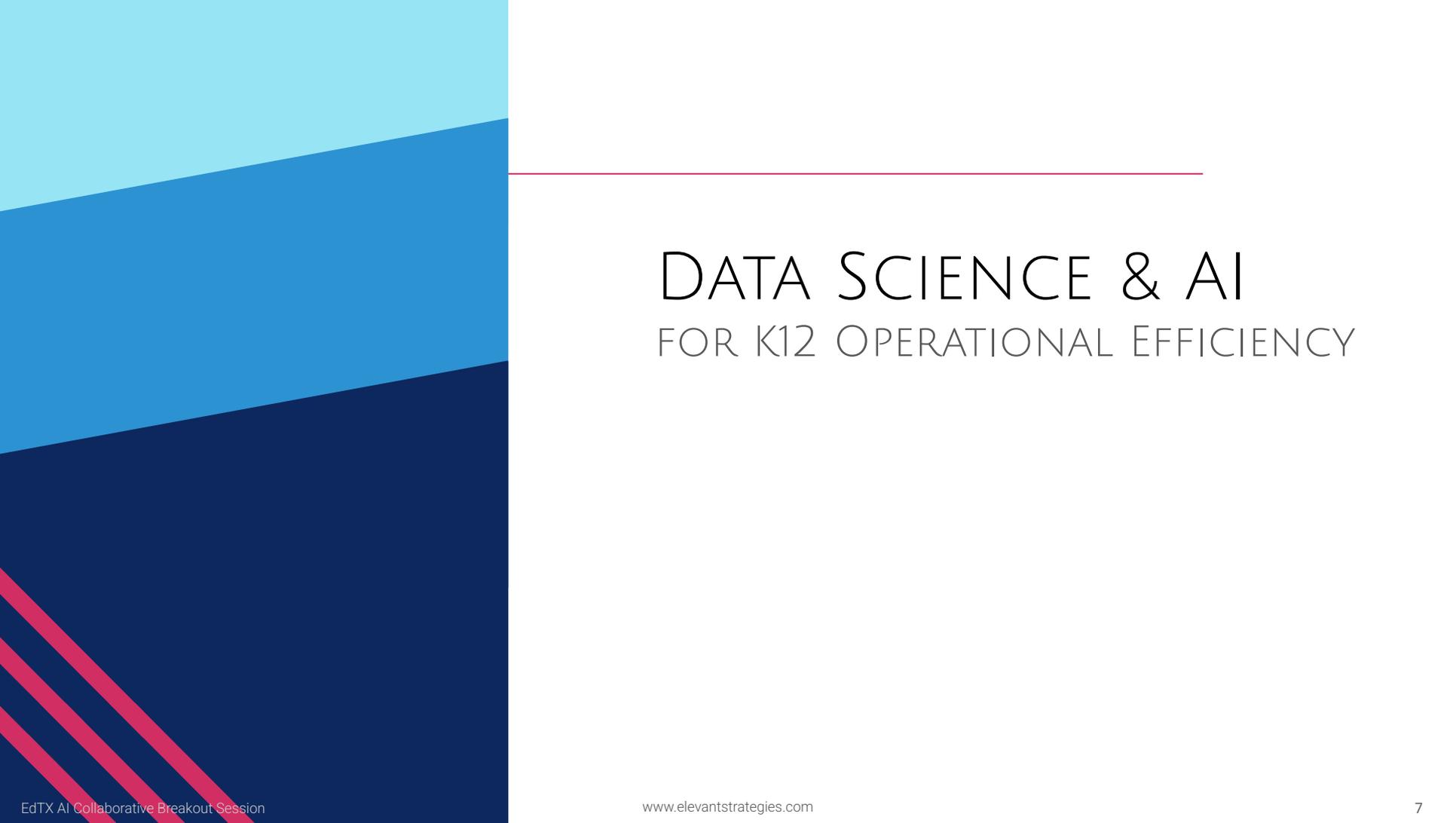
Ice Breaker

K12 Operational Pillars

- Human Resources
- Finance & Budgeting
- Technology
- Facilities & Maintenance
- Communications & Marketing
- Safety
- Logistics
- Student Systems

Ice Breaker Questions

1. Raise your hand if you face a challenge in any of these areas

2. Raise your hand if you have explored an AI-driven solution for it

Data Science & AI
for K12 Operational Efficiency

INTRODUCTION TO AI
KEY THINGS TO KNOW

AI is not new!

- AI uses math to model relationships across information

- Scientists and businesses have developed and leveraged AI since the 1950s

- Generative AI (GenAI) is a recent and ongoing development

You already use AI

- Siri, Alexa

- Streaming apps

- Google search

- Parking sensors in cars

- Ride sharing apps

- Customer support chatbots

Generative AI - why now?

- LOTS of internet data + cloud storage/compute + better processing chips

- ChatGPT launched as first public-facing GenAI tool in late 2022

Introduction to AI
From Data Science to Generative AI

Data Science
Advanced Analytics and Traditional AI

What it does
- ✔ Rules & logic
- ✔ Clustering
- ✔ Classification
- ✔ Prediction
- ✔ Optimization

How it works
- ✔ Well-defined inputs (spreadsheets, attendance logs, etc.)
- ✔ Tailored to use cases
- ✔ Operates on structured data

In practice
- ✔ Enrollment forecasting
- ✔ Transportation or staffing optimization
- ✔ Budget and resource planning

*If you hire a **data scientist**, this is their core expertise*

Generative AI
Generate Content & Orchestrate

What it does
- ✔ Brainstorming
- ✔ Summarization
- ✔ Writing drafts
- ✔ Content generation
- ✔ Workflow orchestration

How it works
- ✔ Uses flexible inputs (text, images, audio, video)
- ✔ General purpose interface
- ✔ Responds to natural language instructions

In practice
- ✔ Draft job descriptions or interview questions for hiring
- ✔ Code assistant to speed up IT operations
- ✔ Chatbots to reduce IT help desk calls

***AI expert** can mean many things – clarification matters*

Both require strong governance, human oversight, clear guardrails, and thoughtful integration

INTRODUCTION TO AI
FROM DATA SCIENCE TO GENERATIVE AI

Data Science	Generative AI
Advanced Analytics and Traditional AI	Generate Content & Orchestrate

Data Science

Limitations

- ✖ Requires careful data preparation and feature engineering
- ✖ Cannot directly respond to natural language prompts
- ✖ Limited flexibility for open-ended tasks
- ✖ Susceptible to bias and ambiguity

Generative AI

Limitations

- ✖ May generate inaccurate or inconsistent outputs ("hallucinations")
- ✖ Not (yet) reliable for precise forecasting, optimization, or numerical analysis
- ✖ Lacks common sense & true creativity
- ✖ Challenging to fully validate or audit
- ✖ Susceptible to bias and ambiguity

K12 Operational Pillars
Example Processes & Challenges for Inspiration

Operational Pillar	Process	Challenge	Potential Solution
Human Resources	Hiring workflow	Manual creation of interview questions slows hiring and reduces consistency	Use Generative AI to standardize and accelerate interview preparation
Technology	Maintaining IT infrastructure and supporting end users	IT staff time consumed by routine helpdesk inquiries	Deploy a district AI helpdesk to automate replies to common support requests
Finance	Annual budgeting	Estimating school-level annual enrollment	Leverage data science to forecast enrollment based on past trends and local demographic data

FRAMEWORK:
DRIVING K12 OPERATIONAL EFFICIENCY WITH DATA SCIENCE & AI

The Framework
A Practical 4-Step Approach

Step 1	Step 2	Step 3	Step 4
Pinpoint high-priority operational challenges	Assess whether data science & AI can help address your high-priority challenges	Navigate the complexity and risk of solutions driven by data science & AI	Define tangible and measurable indicators of success

The framework handouts are yours to reference as you explore opportunities.

Small Group Activity
Applying the Framework
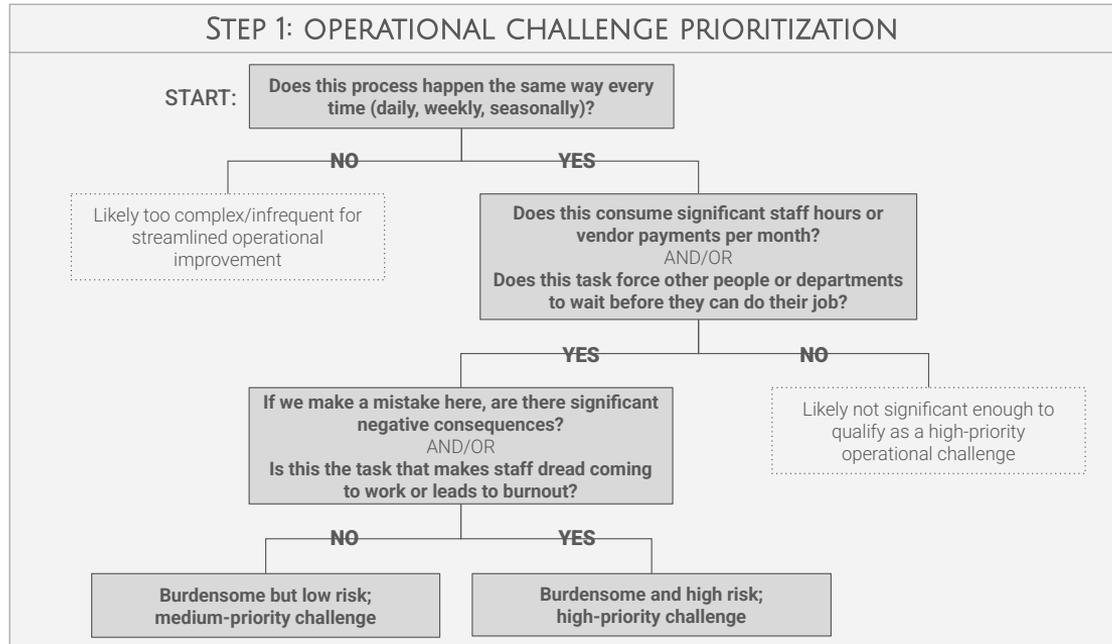
PREPARING FOR SMALL GROUP ACTIVITY
OPERATIONAL CHALLENGE BRAINSTORM

1. **Brainstorm Challenges**: Write **one operational challenge per post-it note**. Think broadly about what makes you or your team's work harder, slower, or less efficient.

2. **Categorize by Pillar**: Place your post-it notes under the relevant operational pillar on the whiteboard:
   - Human Resources
   - Finance & Budgeting
   - Technology
   - Facilities & Maintenance
   - Communications & Marketing
   - Safety
   - Logistics
   - Student Systems

3. **Join a Pillar Table:** Choose **one of the 8 pillars** that interests you most and move to that table to continue the discussion.

Small Group Activity – Step 1
Prioritizing Operational Challenges

Use the prioritization flowchart (page 1) to **identify 2 - 3 high-priority challenges** per table

Step 1: operational challenge prioritization

START: **Does this process happen the same way every time (daily, weekly, seasonally)?**

NO → Likely too complex/infrequent for streamlined operational improvement

YES → **Does this consume significant staff hours or vendor payments per month?**
AND/OR
Does this task force other people or departments to wait before they can do their job?

YES → **If we make a mistake here, are there significant negative consequences?**
AND/OR
Is this the task that makes staff dread coming to work or leads to burnout?

NO → Likely not significant enough to qualify as a high-priority operational challenge

NO → **Burdensome but low risk; medium-priority challenge**

YES → **Burdensome and high risk; high-priority challenge**

Small Group Activity – Step 2
Identify Viable Data Science & AI Use Cases

Use the matrix below (page 2) to **assess whether data science & AI can help address** your high-priority challenges

STEP 2: DATA SCIENCE AND AI VIABLE USE CASES		
Strong Case for Augmentation	**Some Potential for Augmentation**	**Human-Critical Tasks**
Generative AI • Info search, gathering, & synthesis • Document & report drafting • Communication & correspondence • Interpretation & translation • Training & instruction preparation • Help desk chatbot • Code assistant	• Decision-making & prioritization • Strategic planning • Hiring management • Ethical/legal review • Database management • Brainstorming • Quantitative analysis	• In-person relationship building • Complex negotiation • Ethical leadership & accountability • Institutional representation • High-stakes/high-risk decisions
Data Science • Forecasting & demand planning • Early warning signals and error detection • Logistics & resource optimization • Quantitative analysis & inference • Pattern recognition & categorization	• Data cleaning & preparation • Scenario simulation • Causal inference • Defining success metrics	

- Which challenges did you identify as viable candidates for data science & AI augmentation?

- Which applications of data science & fit best as a potential solution?

Small Group Activity – Step 3
Risk and Complexity Assessment

Navigate complexity and risk of potential data science & AI solutions, working through the dimensions below (page 3) and their additional details (pages 4-6)

STEP 3: DIMENSIONS OF DATA SCIENCE & AI IMPLEMENTATION		
1. Strategic Intent	1. Autonomy	**1.1.1** Will the solution provide recommendations for human decision-making, or will it take actions autonomously? **1.1.2** Are there tasks that must remain under human control for regulatory, ethical, or risk management reasons?
	2. Mode	**1.2.1** What types of input data will the solution need to process (numeric data, text, images, audio, video)?
	3. Function	**1.3.1** Is the primary goal to streamline a task or render a process more efficient? **1.3.2** Is the primary goal to analyze what happened/is happening, or to forecast or optimize what will happen?
	4. Explainability	**1.4.1** Will stakeholders need to understand how the solution reaches its conclusions?
2. Technical Implementation	1. Architecture	**2.1.1** Are there existing out-of-the-box solutions that meet your needs, or does the solution require custom integration? **2.1.2** Do you have the expertise within the team to architect, cost-out, and build a solution in-house, or manage a vendor?
	2. Data Context	**2.2.1** Will off-the-shelf models trained on general data suffice, or does the solution require specific domain knowledge? **2.2.2** Will proprietary or personally identifiable data (PII) information need to be processed as part of solution?
	3. Data Accessibility	**2.3.1** Where does the required input data currently reside, and how easily can the data be accessed?
	4. Data Format	**2.4.1** Will your solution require input data that is consistently formatted and complete, and if so, is significant cleaning and preprocessing required?
	5. Maintenance	**2.5.1** Will this solution's performance degrade overtime without regular monitoring and maintenance?
3. Scope	1. Scale	**3.1.1** Will the solution address a single-user specific function, or will it have cross-organizational implications? **3.1.2** Will the solution run a data science or AI model with high and regular frequency, or only as-needed?
	2. Rollout	**3.2.1** Who will be the primary users, and what is their technical sophistication? **3.2.2** Does the organization currently have in-house technical experts that can assist with user questions and/or engage with/provide feedback to a vendor?

- What did you learn about the complexity and risk of potential data science & AI solutions?

- Which potential solutions are low-hanging fruit? What potential roadblocks did you uncover? Were you able to think of possible workarounds?

- Based on the discussion, what are your next steps?

Small Group Activity – Step 4
TANGIBLE AND MEASURABLE INDICATORS OF SUCCESS

Brainstorm and **discuss potential success metrics** using the framing below (page 7)

If we could reduce the

. . . time spent on . . .
. . . money spent on . . .
. . . errors produced within . . .

this task by _____ %, then our team would be able to

. . . redirect our focus toward _____.
. . . reduce our monthly expenditures by _____.
. . . improve our staff retention rate by _____.

- What success metrics did you identify?

- Give your honest, initial read: How would you weigh the potential value of your solution against its complexity and risk?
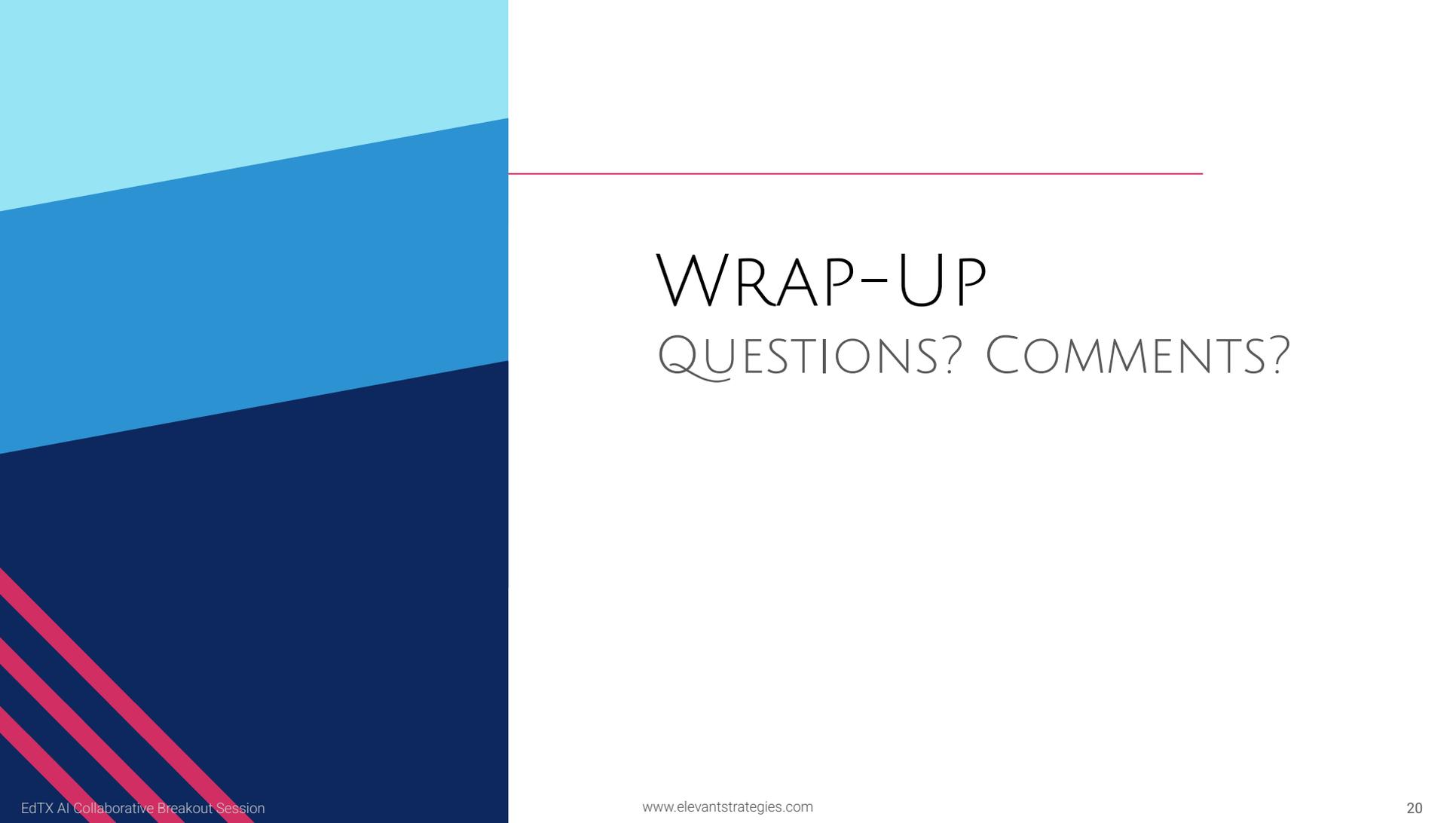
Wrap-Up
Questions? Comments?

THANK YOU!

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