AI Bootcamp

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Agenda

- Introduction and Overview

- Practical Applications of AI

- AI Data Strategy and Management

- Ethics, Regulations and Policy for AI Use

- AI Strategy Implementation

- Closing Remarks, Feedback & Questions

Speaker Backgrounds

Angus Frost

- Senior Technical Consultant at Burger Consulting Group (BCG)
- 30 years in IT, 18 years at BCG

Jason Tschetter

- Sr Director Field Technology & Innovation at Mortenson
- 30 years in IT, 9 years at Mortenson

Introduction

- Overview of the afternoon
- Rules of Engagement (Chatham House Rule)
- Goals and objectives
- Bootcamp approach
  - Presentation
  - Polls
  - Roundtable Discussion

# Quick Poll

Construction's AI Journey

- Construction process evolution
  - From Boxes of Paper to Electronic Information to Digital Data
- Digital transformation of construction is an enabler
- Construction is inherently analysis-intensive
- We are at the intersection of AI and Construction

Low Maturity:
- No standards or policy
- No ownership or champion
- Adoption is limited/spotty
- Limited awareness to potential benefits
- No vision, direction, buy-in with senior leaders

Level 1 – Ad-hoc

Level 2 - Repeatable

Level 3 – Defined

Level 4 – Managed

Level 5 - Optimized
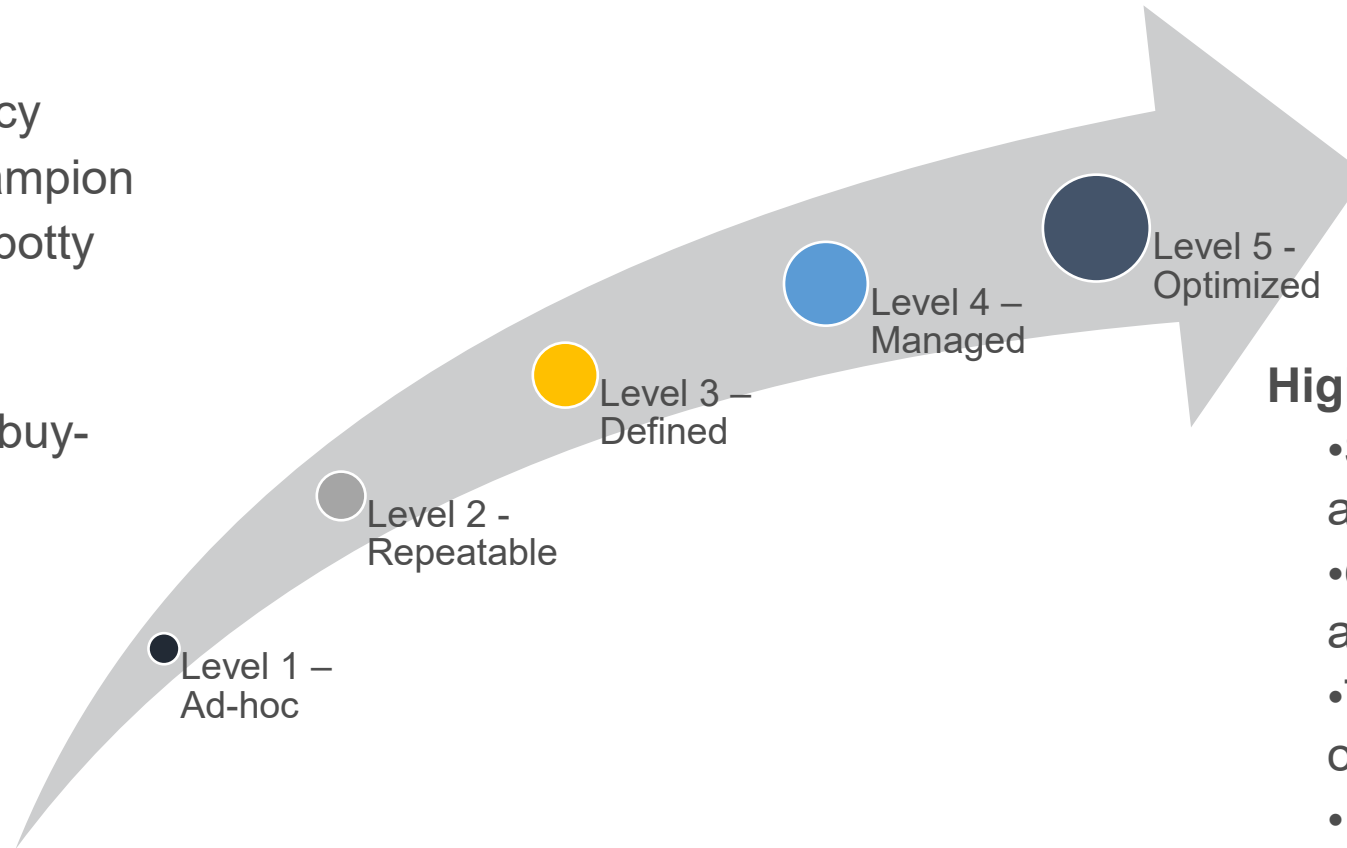
High Maturity:
- Standards are established and supported by policy
- Ownership is clear and governance is in place
- Tools are deployed with ongoing investment
- Focus on strategic value and impact

Key AI Technologies

- **Machine Learning** (ML) – AI systems with the ability to learn from and make decision based on data

- **Deep Learning** – A subset of machine learning that uses neural networks with three or more layers. These neural networks attempt to simulate human decision-making

- **Natural Language Processing** (NLP) – AI that can understand and interact using human language

- **Robotics** – AI used in robots, enabling them to perform tasks autonomously or semi-autonomously

- **Generative AI** – combining ML, Deep Learning and Natural Language Processing to generate text, images, 3D design, video and other content

Practical Applications of AI

Practical Applications of AI

- Backoffice
- Pursuits and Business Development
- Design and Pre-construction
- Project Management and Scheduling

- Supply Chain and Contract Management
- Predictive Maintenance and IoT
- Safety & Risk Management
- Project Closeout and Turnover

Machine Learning Examples

- Predictive Maintenance

- Project Scheduling Optimization

- Safety Monitoring and Enhancement

- Image Recognition for Inspection and Monitoring

- Material and Resource Optimization

- Cost Prediction and Budget Management

- Defect Detection

- Construction Site Layout Planning

Deep Learning Examples

- Automated Design and Planning

- Safety Compliance Monitoring

- 3D Modeling and Augmented Reality

- Resource Allocation and Logistic Optimization

Natural Language Processing Examples

- Automated Document Management
- Chatbots for Project Management
- Requirement Extraction from Textual Data
- Voice Controlled Applications
- Translation and Multilingual Support
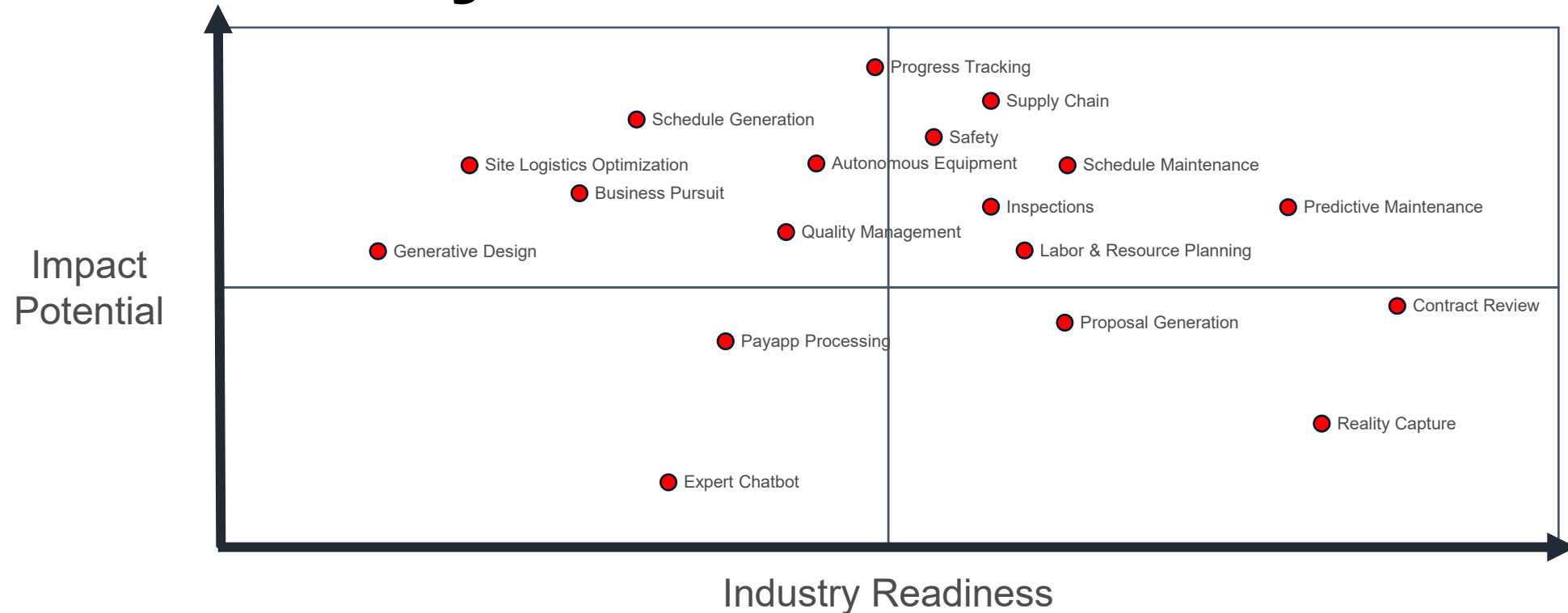- Meeting Summarization and Action Item Tracking

Robotics Examples

- Autonomous Reality Capture
- Robotic Arms or Exoskeletons
- Autonomous Heavy Equipment
- Robotic Layout
- Automated Road Construction

AI Maturity Matrix

Impact Potential (vertical axis) vs. Industry Readiness (horizontal axis)

- Progress Tracking
- Supply Chain
- Schedule Generation
- Safety
- Site Logistics Optimization
- Autonomous Equipment
- Schedule Maintenance
- Business Pursuit
- Inspections
- Predictive Maintenance
- Generative Design
- Quality Management
- Labor & Resource Planning
- Contract Review
- Proposal Generation
- Payapp Processing
- Reality Capture
- Expert Chatbot

Where to start with AI

- Identify work that is: Relatively repeatable, analysis intensive, electronic/digital inputs/outputs

- Similar to other focus areas for automation, but has barriers that traditional automation approaches struggle with
  - Variability, large data sets, unstructured or semi-structured data

- Hint: we often give this type of work to entry-level employees...
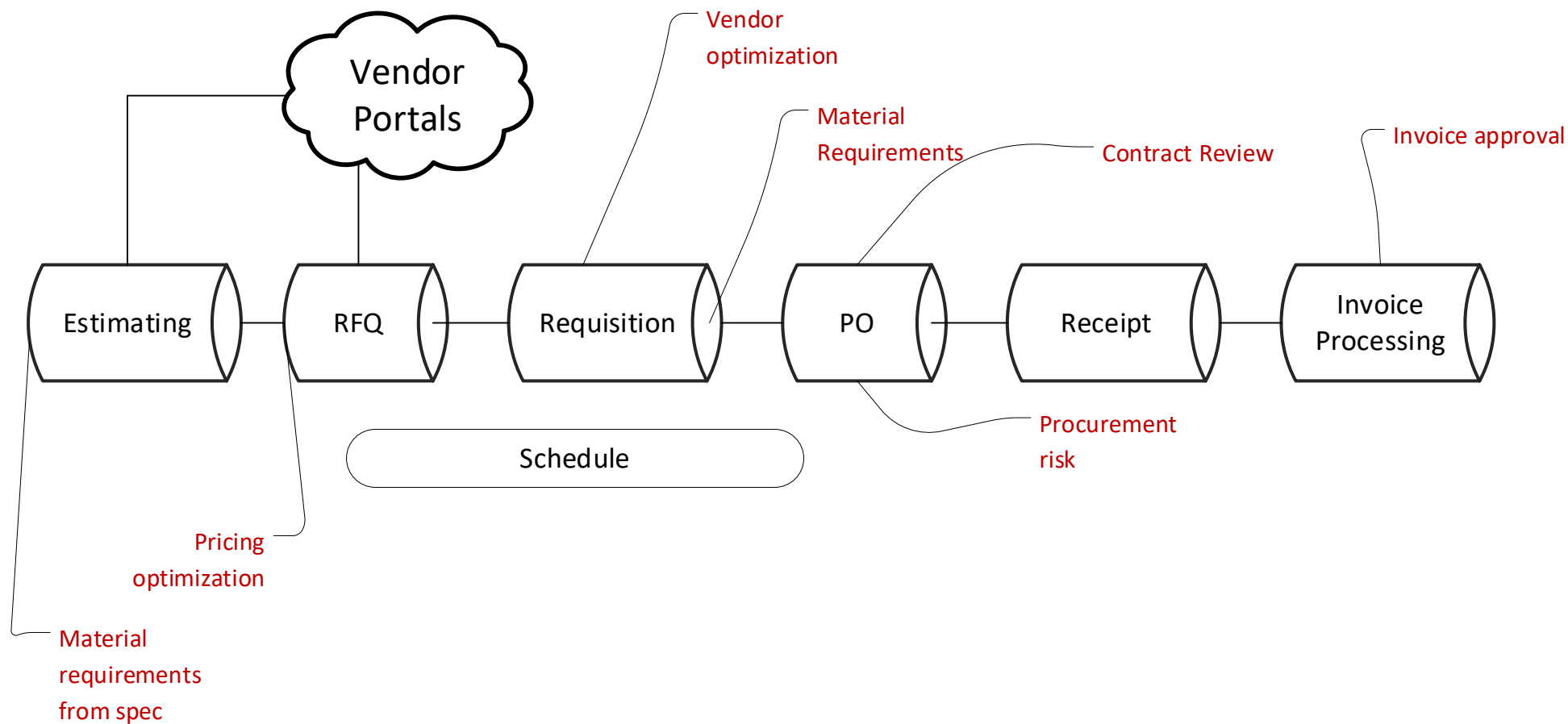
Quick Poll

Round Table Discussion (10 mins)

Question:
What AI opportunities have the most potential in your own company?
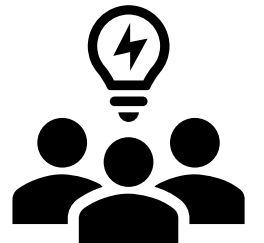
Break (10 mins)

AI Data Strategy and Management

- Identifying sources of data

- Data collection and analysis

- Setting up a data environment for AI

- Grooming your unstructured data for AI

- AI literacy and governance

- Data ownership and security

Identifying sources of data

- Value/importance

- Structured/unstructured

- Quantity, quality, consistency, relevance

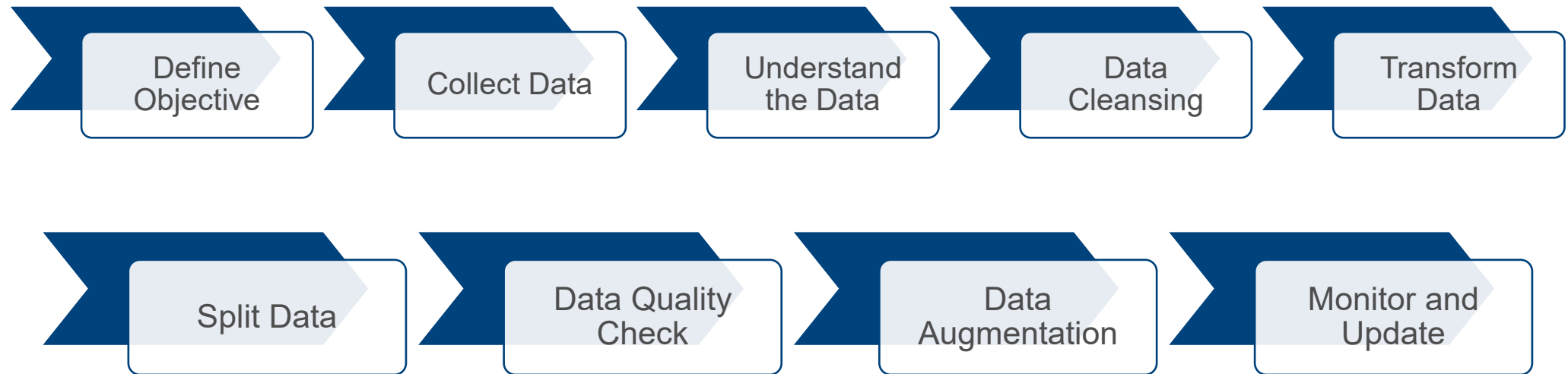- Access, privacy, security and compliance

- Reliability of data collection

Data collection and Analysis

- API, CSV, Third-party
- Data preparation and normalization
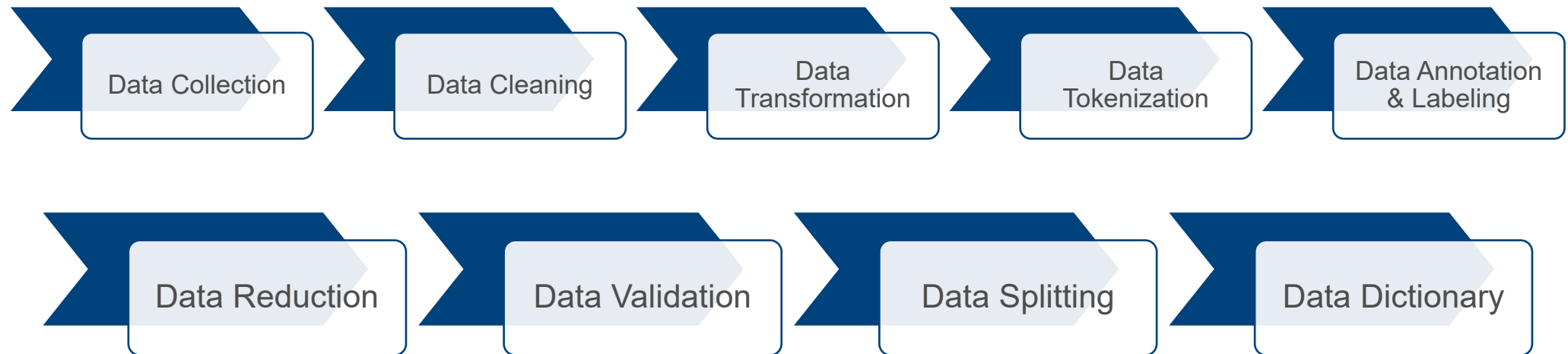- Model Training and Evaluation
- Continuous Improvement

Preparing Structured Data

Define Objective → Collect Data → Understand the Data → Data Cleansing → Transform Data

Split Data → Data Quality Check → Data Augmentation → Monitor and Update

Preparing Unstructured Data

Data Collection → Data Cleaning → Data Transformation → Data Tokenization → Data Annotation & Labeling

Data Reduction → Data Validation → Data Splitting → Data Dictionary

Setting up a Data Environment

- Start with what you have - SharePoint, Data Warehouse, etc.
- Cloud is key for many AI use cases, especially Gen AI
- Understand your processes and identify experts that can help with "good" vs "bad" - inputs, outputs, etc

AI Literacy

- Training Data - large amounts of data are needed to train a model

- Testing Data - some portion must be set aside to test the model

- "Definition of Good" - be aware of perfection expectations

- Supervision - still required, but should elevate the human work to focus on exceptions

Data Ownership

- Defining Data Owners
- Identifying Compliance and Legal Frameworks
- Determining Access Control
- Developing Policies
- Continuous Monitoring and Improvement

Break (30 mins)

Ethics of AI Use

- Ethical considerations in AI use are everywhere
- Privacy, bias, and culture all need to be considered
- Ownership, accountability, and trust are baked into policy and regulatory debates
- Important to have technology leaders knowledgeable and involved in discussions regarding adoption of AI

AI Regulations

- Emerging topic that is chasing a rapidly changing market
- Various federal and state rules are emerging regarding AI use
- Range from copyright to pre-use notices and opt-out requirements
- Defining "what is AI" vs any other software in legal terms is a challenge

Risks with AI Adoption

- Potential for Human Complacency

- Impact to Skills Development

- Lack of AI Transparency, aka "The Black Box"

- Loss of "nuance" and judgement
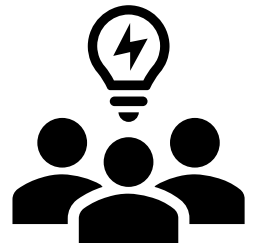
- All can be mitigated with checks and balances

Quick Poll

Round Table Discussion (10 mins)

What is your table's approach to tackling the top challenges?

AI Strategy Implementation

- Developing an AI Strategy
- How do you avoid chasing shiny objects?
- Change Management – Preparing your team
- Measure and manage against the strategy

Early Adopter Approach

- Understand process inputs and outputs
- Understand employee/worker perceptions
- Stakeholder buy-in is critical

Implementing AI Initiatives

- Pitching AI initiatives to stakeholders
- Communicating innovation risks
- Measuring AI success and value
- Risk of incrementalism without strategy

Lessons Learned

- Capturing and building on experience
- Creating a learning culture
- Success in failure

Setting Stakeholder Expectations

- Stakeholder roles
- Myth busting
- Realistic timeline setting
- Success measurement
- Managing change and adoption
- Continuous education

Action Plan

- How do you move your AI Journey to the next level?
- What steps are you going to take when you get back to the office?
- What does next year look like?

Quick Poll

Closing Remarks & Feedback

- How far ahead are you able to plan? Act?
- Challenges to overcome

Questions/Discussion

Speaker Contact Information

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