***Project: Develop an AI-Powered Solution for Mondelez***

**Objective:**

* Work in pairs to develop a concept for an AI-powered solution that addresses a real-world business challenge within Mondelez.
* The project will require your knowledge of AI fundamentals, bias mitigation, data considerations, and project management principles.

**Requirements:**

1. **Define a Business Problem:**
   * Identify a specific and significant business challenge within the Mondelez food and beverage sector that can be addressed with AI.
   * Clearly articulate the problem statement and its impact on Mondelez's business.
2. **AI Solution Concept:**
   * Propose an AI-powered solution to address the identified business problem.
   * Clearly describe the core AI technology involved (e.g., machine learning, deep learning, NLP, computer vision, etc).
   * Explain how the AI solution will work and its expected benefits.
3. **Model Selection:**
   * Discuss the decision to use an "off-the-shelf" pre-trained model (e.g., from a cloud provider) versus developing a custom model from scratch.
   * Consider factors such as:
     + **Cost:** Development and maintenance costs of a custom model vs. licensing fees for pre-trained models.
     + **Data Requirements:** Data requirements for training a custom model vs. data requirements for fine-tuning a pre-trained model.
     + **Time to Market:** Speed of development and deployment for each approach.
     + **Performance:** Expected performance and accuracy of each approach.
     + **Data Security:** Risks associated with using external pre-trained models (e.g., data privacy, vendor lock-in).
4. **AI System Architecture:**
   * Briefly describe the high-level architecture of the proposed AI system.
   * Consider key components such as:
     + **Data Ingestion & Processing:** How will data be collected, cleaned, transformed, and prepared for the AI model?
     + **Model Deployment & Serving:** How will the AI model be deployed and made available for use (e.g., cloud-based services, on-premise servers)?
     + **Monitoring & Maintenance:** How will the performance of the AI system be monitored, and how will the model be updated and maintained over time?
5. **Data Considerations:**
   * Identify the types of data required to train and operate the AI solution.
   * Discuss potential data sources within Mondelez (e.g., sales data, customer data, social media data, production data).
   * Address potential data quality issues, biases, and privacy concerns.
   * Outline a plan for data collection, storage, and processing.
6. **Project Plan:**
   * Develop a simple project plan outlining key milestones, timelines, and resource allocation.
   * Conduct a basic risk assessment, identifying potential project risks and proposing mitigation strategies.
7. **Ethical Considerations:**
   * Discuss the ethical implications of developing and deploying this AI solution.
   * Consider potential societal impacts, consumer trust, and the responsible use of AI.
8. **Presentation:**
   * Prepare a concise presentation of 8 - 10 slides to present their project to the class.
   * The presentation should effectively communicate the business problem, the proposed AI solution, and the key considerations outlined above.

***Suggested Topics (Or Develop Your Own!):***

**Focusing on Consumer Insights & Marketing:**

* **Personalized Product Recommendations:** How can AI be used to recommend the right Mondelez products to the right consumers at the right time, increasing sales and customer loyalty? Consider online and offline channels.
* **Predictive Analytics for Marketing Campaigns:** How can AI predict the success of marketing campaigns *before* they are fully launched, allowing Mondelez to optimize spending and target specific demographics more effectively?
* **Social Media Sentiment Analysis:** How can AI analyze social media conversations to understand consumer sentiment towards Mondelez brands and products, identifying potential PR crises or product development opportunities early on?
* **Targeted Advertising:** How can AI be used to deliver highly targeted online advertising campaigns, maximizing ROI and minimizing wasted ad spend? Consider privacy implications.
* **Understanding Consumer Preferences:** How can AI analyze purchase data, online behavior, and social media interactions to identify emerging trends and predict future product preferences? This could inform new product development.

**Focusing on Supply Chain & Operations:**

* **Demand Forecasting:** How can AI improve the accuracy of demand forecasting for Mondelez products, reducing waste from overproduction and preventing stockouts? Consider seasonality and promotional activities.
* **Supply Chain Optimization:** How can AI optimize Mondelez's complex supply chain, reducing costs, improving delivery times, and mitigating risks from disruptions (e.g., natural disasters, geopolitical events)?
* **Predictive Maintenance:** How can AI be used to predict equipment failures in Mondelez's manufacturing facilities, allowing for proactive maintenance and minimizing downtime?
* **Quality Control:** How can AI be used to automate quality control processes in manufacturing, ensuring consistent product quality and reducing defects?
* **Inventory Management:** How can AI optimize inventory levels across the supply chain, balancing the need to meet demand with minimizing storage costs?

**Focusing on Product Development & Innovation:**

* **Flavor Profile Development:** How can AI be used to analyze consumer preferences and identify new and exciting flavor combinations for Mondelez products?
* **Recipe Optimization:** How can AI optimize existing recipes to improve taste, texture, or nutritional value while minimizing costs?
* **Packaging Design:** How can AI be used to analyze consumer feedback and design packaging that is more appealing, functional, and sustainable?

**Focusing on Sales & Distribution:**

* **Optimizing Distribution Routes:** How can AI be used to optimize delivery routes for Mondelez products, reducing transportation costs and improving delivery efficiency?
* **Sales Forecasting:** How can AI be used to forecast sales performance at the regional or store level, allowing for better resource allocation and inventory management?
* **Retail Execution:** How can AI be used to analyze in-store data (e.g., shelf placement, promotions) to improve product visibility and sales?