Practicum Project Abstract: Strategic CapEx Intelligence in Contract Manufacturing

1. Flex Company Overview

Flex (formerly Flextronics) is a global leader in diversified manufacturing services and supply chain solutions. Headquartered in Austin, Texas (domiciled in Singapore), Flex operates across 30 countries with a workforce of approximately 160,000 employees. The company has evolved beyond traditional Electronics Manufacturing Services (EMS) to become a "Sketch-to-Scale" solutions provider, serving industries ranging from Automotive and Healthcare to Cloud/Data Centers and Industrial sectors.

Currently, Flex is navigating a significant industry pivot. As the demand for generative AI drives massive infrastructure build-outs, Flex is expanding its portfolio in power, compute, and liquid cooling technologies. However, the company maintains a strategic discipline, aiming to balance these high-growth AI opportunities with its stable, traditional core businesses to mitigate exposure to market volatility.

2. Project Objectives

The primary objective of this Practicum is to develop a competitive intelligence tool leveraging Natural Language Processing (NLP) to map the capital expenditure (CapEx) landscape of the contract manufacturing industry.

Key goals include:

- **Quantify Competitor Focus:** Determine the ratio of investment dollars flowing into "AI/Data Center" initiatives versus "Traditional" sectors (Medical, Industrial, Automotive) for key competitors.
- **Identify Risk Exposure:** Assess the industry's collective over-exposure to AI spending trends, helping Flex identify if competitors are over-leveraging in a potential bubble.
- **Enable Natural Language Discovery:** Create an intuitive interface allowing strategy teams to ask complex questions (e.g., *"Which competitors are building liquid cooling capacity in North America?"*) without needing manual data processing.

3. Project Description

The contract manufacturing industry is currently in a "super-cycle" of spending, driven primarily by hyperscaler demand for AI data centers. Competitors such as **Jabil**, **Celestica**, **Benchmark Electronics**, and **Sanmina** are making aggressive capital investments to capture this market. Flex requires a data-driven approach to understand these moves to ensure its own investment strategy remains balanced and resilient.

This project involves building an AI-powered analytics application that mines unstructured text data. Students will ingest earnings call transcripts, investor presentations, and analyst reports to extract specific "signals" regarding facility expansion, technology acquisition, and CapEx allocation.

The analysis will cover the following competitive set:

- **Jabil Inc.:** Focusing on their recent operational expansions and data center strategy.

- **Celestica:** Analyzing their shift toward "Hardware Platform Solutions" and hyperscaler partnerships.
- **Benchmark Electronics:** Investigating their investment mix between high-performance computing vs. their traditional medical/aerospace strongholds.
- **Sanmina Corporation:** Examining their vertical integration strategies and recent aggressive moves in the server ecosystem.
- **Flex (Control):** Using Flex's own public communications to benchmark data accuracy and sentiment.

4. Project Work Steps
The project will be executed in four distinct phases:

- **Phase 1: Data Aggregation & Cleaning**
  - Scrape and compile the last 12 quarters of earnings call transcripts (seeking and prepared remarks), investor day presentation decks, and available analyst reports for all 5 target companies.
  - Clean and normalize text data for NLP ingestion.

- **Phase 2: NLP Pipeline Development**
  - Utilize off-the-shelf Large Language Model (LLM) APIs (e.g., OpenAI, Anthropic, or open-source equivalents like Llama) to perform Entity Extraction and Sentiment Analysis.
  - Develop specific prompts to extract "CapEx Events" (e.g., factory openings, machinery purchases, M&A activity).
  - Categorize investments into "AI/Data Center" vs. "Non-AI/Traditional."

- **Phase 3: Application Construction**
  - Build a Retrieval-Augmented Generation (RAG) application.
  - Implement a vector database to store indexed industry data.
  - Create a user interface (chatbot style) that accepts natural language queries and returns cited answers based on the ingested documents.

- **Phase 4: Strategic Analysis & Reporting**
  - Use the developed tool to answer key strategic questions regarding competitor concentration.
  - Synthesize findings into a final strategic report advising Flex on investment balance and potential market overheating risks.

5. Project Deliverables
At the conclusion of the engagement, the team will deliver:

1. **Competitive Intelligence Application:** A functional, local or cloud-hosted web application allowing Flex strategists to query the dataset using natural language.
2. **Source Code & Documentation:** Complete Python/code repositories with documentation on how to update the dataset with future earnings transcripts.
3. **Strategic Landscape Report:** A presentation deck summarizing the investment posture of Jabil, Celestica, Benchmark, and Sanmina, highlighting areas of saturation and "white space" opportunities for Flex.

4. **Risk Assessment Matrix:** A comparative visualization showing each competitor's estimated dependency on sustained AI growth rates.