CASE

STUDY

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AI Powered SLD
BOM Creation

Business Problem

- The manual creation of Bills of Materials (BOM) for Single Line Diagrams (SLDs) is time-consuming, error-prone, and resource-intensive.

- Organizations face challenges in accurately identifying components from SLDs and generating precise BOMs due to human error, inconsistent standards, and the need for expertise.

- The business needs an AI-powered solution capable of automating the identification of components in SLDs and generating BOMs efficiently, thereby reducing processing time, improving accuracy, and ensuring consistency across projects.

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Tools & Technologies

- Python
- Computer Vision
- Yolo v8
- EasyOcr
- FastApi Python backend
- ReactJS : Application front end UI

Implementation Strategy

Artifact Management and Centralized Logging - Utilized Azure Artifacts for storing project artifacts and implement a centralized logging solution with Graphana (GUI Tools) for streamlined log access across the organisation.

CI/CD Workflow and database Deployment- Establish s QA CI/CD workflow in GitHub Actions, incorporating a branching strategy to enhance performance and monitoring, Additionally, deploy the interop, postgreSQL database using an automated pipeline to execute,SQL scripts across different environments.

Security And Emails Services- Implement an Auth Sidecar to secure backend services in the K8's cluster and configure a send grid resource for efficient email communication within the application infrastructure.

Implementation Approach

- **Train YOLOv8 on diverse SLDs to detect multiple components and perform inference on industrial SLDs.**

- **Identify text regions and map them to components using a nearest-coordination match algorithm to extract specifications and calculate component counts.**

- **Design an interface to display detected components with images, counts, and specifications, and provide a CSV download option.**

- **Use co-reference IDs to retrieve cost information and calculate the total cost for identified components based on specifications and counts.**

- **Enable end-to-end automation for efficient and consistent SLD component identification and BOM generation.**

Architecture Diagram

AI Powered SLD BOM Creation
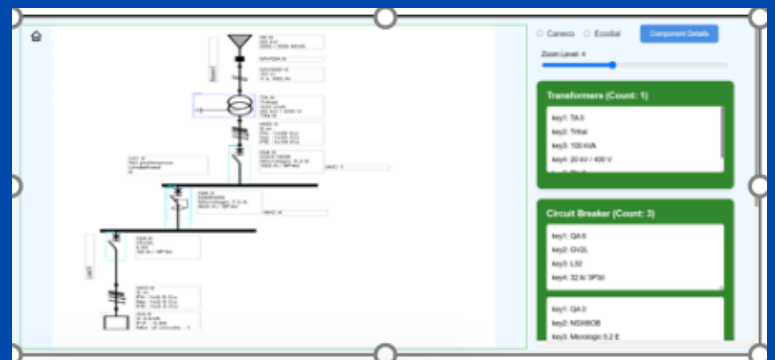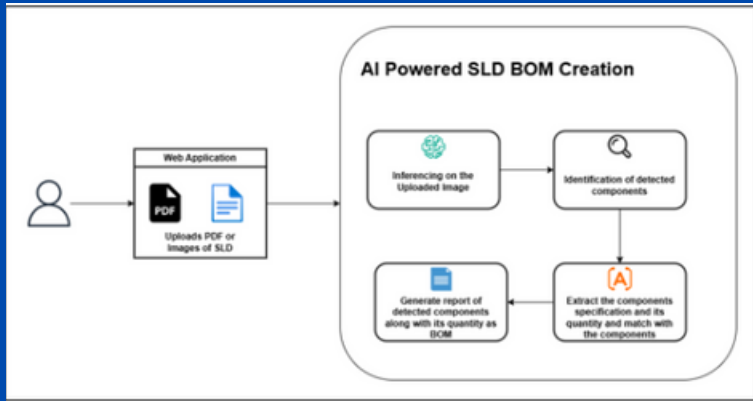
Value Delivered to the Customer

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Reduction in overall operational infrastructure and maintenance cost by 40%.

Improved application scalability.

Increased availability of the application by 70% with multi-region deployment.

Robust disaster recovery strategy delivered for a dynamic workload.

Enhanced security.

Improved and efficient monitoring, logging and alerting system for the entire application.

For more information, write to us at hello@xfactr.ai

About XFactr.AI

At XFactr™.AI, we're revolutionizing industries with our bold 3D approach to digital transformation:

1 **Digital Full-stack Development**
2 **Data Science & AI ML**
3 **DevOps & Cloud**

Data is our backbone, and AI is our superpower. We blend traditional digital technologies with cutting-edge AI to create future-ready solutions that drive real impact. With a proven track record of building and exiting successful companies, our leadership brings decades of expertise in digital tech and AI to inspire trust, innovation, and results.

Whether empowering global enterprises or fueling disruptive startups, we turn bold ideas into intelligent products. Join us—we're on track to become the next unicorn by 2040! 🚀 People might call us mad, but we're focused, ambitious, and determined to make it happen.

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