

VISIONFLEX

4G



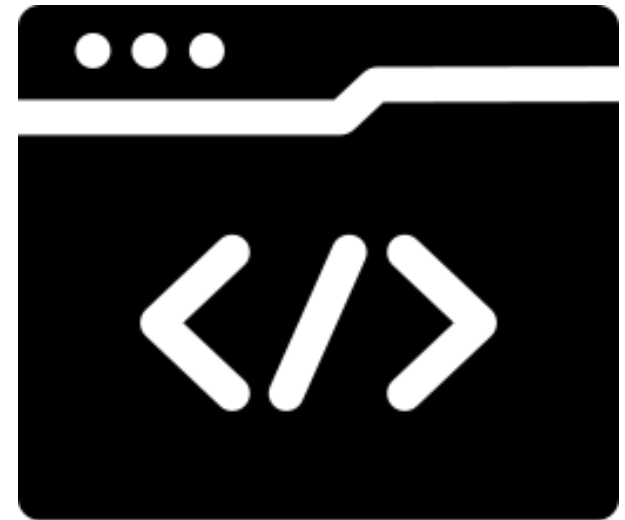
Project Overview

- Visionflex is a solution to control sales, stability and savings on stretch film working on Stretch wrapping machine. Visionflex will be sold to our global partners. Our partner will install Visionflex on customers wrapping machine to monitor consumption of film, Prestretch % and number of pallet used.
- With the unit we are able to collect important data for our customers.
- The Visionflex system will give info on: Film consumption, number of pallet wrapped, prestretch %.
- We want to have daily SMS service and different reports and alarms.
- The platform is developed as a **SaaS-based CRM solution**, enabling centralized data management, multi-user access, and seamless integration for global partners and customers.



Tools & Technologies

- **Backend:** PHP
- **Frontend:** HTML, CSS, JavaScript, Bootstrap
- **Database:** MySQL



Objectives

Monitor Film Consumption

- Track exact film usage per job, per day, and per machine.

Ensure Consistent Load Stability

- Maintain accurate prestretch percentage for stable pallet wrapping.

Automate Reporting & Alerts

- Provide daily SMS/email updates and automatic alarms for abnormal usage.

Reduce Costs & Waste

- Minimize film wastage and optimize resource use through real-time data.

Support Global Integration

- Provide a standardized system that can be installed and managed by global partners.

Our Role and Responsibilities

1. System Design & Development

- Designed the **VisionFlex hardware and software architecture**.
- Integrated sensors, and Industruino microcontroller for data capture.

2. Cloud Integration

- Configured **Microsoft Azure** for data storage, filtering, and analytics.
- Developed **API systems** to upload, process, and manage real-time data.

3. Data Analytics & Reporting

- Built algorithms to calculate **film consumption** and **prestretch %**.
- Designed automatic **SMS/email reporting system** for customers.

4. User Interface & Dashboard

- Created **partner login portal** for global access.
- Enabled real-time reporting and visualization by machine, roll, or date range.

5. Testing & Implementation

- Tested system accuracy and calibration across multiple machine types.
- Managed pilot installations and validation for performance reliability.

Problem Statement

- Lack of accurate monitoring of film consumption and prestretch %
- Overuse or underuse of film causing wastage and instability
- Manual data collection prone to error
- No real-time reporting or alerts
- Inefficient tracking across multiple machines



Challenges



Hardware Integration

- Required precise wiring and signal synchronization.

Data Accuracy

- Different roller sizes and gear ratios caused measurement variations.
- Needed calibration formulas for accurate readings.

Cloud Data Handling

- Managing large CSV data sets and removing invalid entries was difficult.
- Required strong API filtering logic.

Report & Alert Automation

- Ensuring reliable SMS/email alerts across time zones was challenging.
- Avoiding false notifications required precise thresholds.

Global Partner Training

- Varied technical skills among partners demanded clear training and documentation.

System Scalability

- Adapting VisionFlex to multiple wrapping machine models required flexible design.

Solution – VisionFlex System

- Real-time monitoring of film usage, prestretch %, and pallet count
- Cloud integration via Microsoft Azure
- Daily SMS/email reports and alarm alerts
- Installed by global partners for local customers

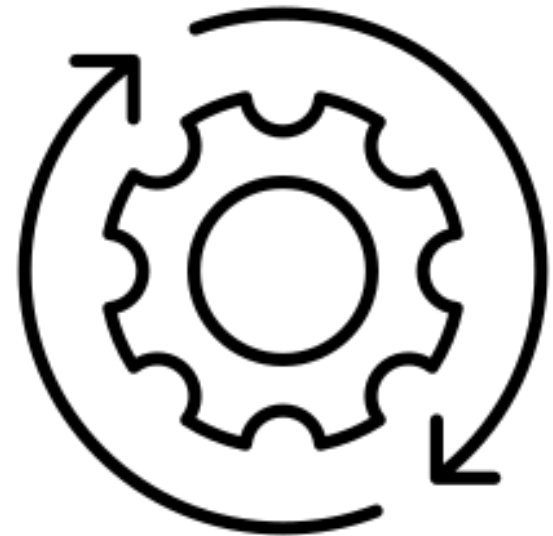
Technical Implementation

Hardware:

- Industruino microcontroller
- Two inductive sensors

Data Flow:

- CSV data sent to cloud server via API
- Processed and visualized in reports



Data Processing & Calculations

- Film consumption = $\text{Rotations} \times \text{Roller Diameter}$
- Film weight = $\text{Thickness} \times \text{Width} \times \text{Density} \times \text{Length}$
- Prestretch % = $(\text{Sensor2} \div \text{Sensor1} - 1) \times 100$
- Reports include film usage, prestretch %, and pallet counts per day/week/month.



Cloud Platform – Microsoft Azure

- Cloud storage and API filtering for valid data
- Generate custom reports by machine, roll, or time period
- Visual dashboards and automated reporting

Alerts & Reporting

- Daily SMS and email reports for consumption and pallet count
- Alarm function for abnormal prestretch % or usage
- Automatic report generation for partners and customers



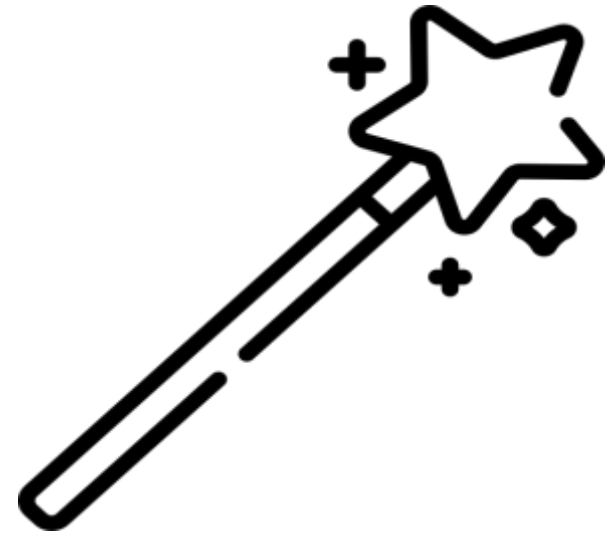
Expected Outcomes

- Reduced film wastage
- Improved load stability
- Enhanced data transparency
- Greater operational efficiency
- Sustainability through lower film use



Future Enhancements

- QR scanner integration across all devices
- AI-based predictive analysis
- Mobile monitoring app
- CO₂ savings and sustainability reporting



Conclusion

- VisionFlex brings intelligence to every wrap by merging IoT, cloud computing, and automation to create a smart, efficient, and sustainable packaging process.
- → VisionFlex – Intelligence in Every Wrap

