**INVESTMENT PROPOSAL:**

A Product Lifecycle Management (PLM) System for a Plastic Manufacturing Company

**BUSINESS PROBLEM:**

P-TICS, a medium sized plastic manufacturing factory, is facing issues with efficiency and quality due to lack of co-ordination in its manufacturing process. They produce a high number of different products for several buyers and are facing issues with inconsistencies and errors in final products. The company wants to reduce costs accrued from losses due to rejected products. They are also trying to incorporate sustainability practices like recycling and waste reduction in their processes.

**PROPOSED IT SOLUTION:**

The Proposed IT investment solution to combat these problems is a Product Lifecycle Management (PLM) System to manage the lifecycle of each product in their entire product line, from initial design to final deliveries. The key features of this system include:

**Prototyping and feedback generation:** The PLM system allows for detailed designs and prototypes of products to be created and shared with not just engineers, but also with partners, suppliers and customers. The feedback generated will be used to further refine the product and other components before the market-ready version is created.

**Collaborative creation:** The system will enable different teams like design and engineering collaborate and work together using a common enterprise product data like material and parts requirements, engineering changes, workflows, and regulations.

**Management:** The system will allow for management and maintenance of the business processes in the entire product’s lifecycle.

**Quality assurance**: The system enables maintenance of the integrity of the product definition and related information throughout its lifecycle.

**Distribution:** The system provides tools and information about distribution of products. This enables the company to make sure all their sales channels are receiving and displaying the correct product information.

**ALIGNMENT WITH ORGANIZATIONAL GOALS:**

The PLM System aligns with the company’s goals of improving efficiency and co-ordination, reducing losses from errors and rejections and adopting sustainability practices in the following ways;

* The PLM allows the company to produce prototypes of products that can be inspected and adjusted as needed before the market version is produced in large quantities is produced. This will ensure that there are no errors and the buyers are satisfied before production, therefore preventing large losses from unsatisfactory products. This also helps to reduce waste
* The PLM gives designers and engineers access to the critical information they need in real time. This streamlines project management, supporting better knowledge sharing, collaboration and co-ordination. Designers and engineers can understand new or changing requirements, this way there is reduced likelihood of errors in the manufacturing process.
* With a centralized source of information, updates are easier to manage and disseminate. This allows them to be more efficient and reduce time to market.
* Finally, through effective management and distribution, the PLM enables the company to track their outputs and incorporate recycling for waste products.

**ECONOMIC ANALYSIS:**

**Costs:** The expected costs of the PLM system are

* Initial cost of acquiring software, including software licensing costs, consulting services,
* Implementation and customization costs, including integration with other software like Computer-Aided Design (CAD), Project management, Customer Relationship Management (CRM)
* Employee training,
* Ongoing maintenance and updates cost

**Benefits:** The expected benefits of the PLM system are:

* Operational efficiency and reduced development cycle. Enables products to be virtually designed, analyzed and produced, significantly reducing the time taken to develop the product.
* Centralization: consolidate all product data, designs and documentation, reducing duplication and errors.
* Decreased compliance risks: Helps adhere to industry regulations like ISO, FDA and RoHS by maintaining detailed records and audit trails.
* Reduced costs: Reduce costly design and production errors through version control and validation processes. Expected 60% annual reduction in errors.
* Increased productivity: facilitates better communication among design, engineering and production teams to speed up entire production process. Expected 20% annual increase in output,
* Enhanced product quality: Includes tools for virtual testing and validation, ensuring products meet quality standards before manufacturing. Also tracks revisions and communicates changes so that they are implemented accurately reducing risk of defects.
* Integration with other tools: Integrates with tools like CAD, ERP, CRM and Project management tools, further enhancing efficiency and a unified digital ecosystem.
* Business scalability: Scales with the company as it grows or expands into new markets. Also provides insights into performance, driving ongoing processes and product improvement.
* Improved customer loyalty: Integrates with CRM system, facilitates creation of customized products by maintaining a library of design variations and ensuring high quality production.
* Sustainability: Tracks materials and processes to identify areas for reducing waste. Facilitates the use of recycled plastics by tracking material properties and sourcing data. Expected 60% annual reduction in total waste.

The net present value (NPV) of the project, calculated over a 5-year period with a discount rate of 10%, is estimated to be $8.2 million, indicating a favorable return on investment.

**RISKS AND STRATEGIES:**

**Risks:**

* Data Breaches and IP theft: The PLM system will store sensitive product data, making it a target for cyberattacks. A data breach can lead to reputational damage, data loss and legal issues.
* User Errors: User errors or misconfigurations can lead to unauthorized access to important assets.
* Poor integration: If the integration software between the PLM and ERP systems isn’t set up correctly, it can lead to additional costs and data quality issues.

**Strategies to mitigate risks:**

* To mitigate the data breaches, the system will use strong authentication strategies like Multi Factor Authentication (MFA) to reduce unauthorized access, enable deployments with encryption and compliance with relevant data protection laws. Regular audits and updates will ensure that security standards remain high.
* To mitigate the user error risk, a least privilege access will be established to ensure that the platform, its apps, data and data access and other important resources are set up so only the users who need access are granted access.
* To mitigate the risk of poor integration, DevOps processes will be used, which should include the automation of continuous integration, testing and continuous deployment processes, ensuring a minimal number of people are involved with the process, reducing the risk of human error.

**FIT WITH ORGANIZATION’S IT INVESTMENT PORTFOLIO**

The proposal complements the company’s existing IT investment portfolio by enabling integration, and reduced IT costs through standardization. The PLM system is able to integrate with other important systems used by the factory like the Computer-Aided Design (CAD) system and the Customer Relationship Management (CRM) system.

**PLAN TO CHARGE USERS FOF THE PROPOSED SYSTEM**:

The intended chargeback approach for the proposed PLM system is the service center on a project basis. This way, the PLM costs are assigned directly to specific projects and clarity is provided on project costs and profitability.

Steps for implementation:

* Defining allocation criteria by identifying metrics like projects and users for cost distribution
* Integrating with financial systems like the ERP to streamline the process
* Monitoring and optimization to ensure fairness and ensure cost-saving opportunities
* Communicating with stakeholders to help all departments understand the model to avoid conflicts

**CHANGE MANAGEMENT LEVERS**

Since this a system with relatively low technical complexity and high interdependence, the key levers for addressing change management include clear communication, employee involvement, employee training, peer support and top management support. Employees should understand how the new system will benefit both their workflow and customer interactions. Incentives and feedback mechanisms can be implemented to encourage adoption.

**CHANGE MANAGEMENT STRATEGY:**

Due to the organizational culture and the scope of the change, which is an evolutionary change, a learning approach with a phased roll-out will be ideal for this system. This will allow for gradual adoption, training, and troubleshooting. Regular employee feedback will be collected to refine the system and improve user experience during the transition. The steps that will be carried out to achieve this are:

* **Goal definition and benefit communication:** to clarify why the PLM system is being implemented and highlight the specific benefits and advantages to individual users.
* **Stakeholder engagement:** identify and include key stakeholders like executives, department heads, IT teams, and end users in the entire process including the planning and decision making to ensure buy-in.
* **Conducting a change impact assessment:** to identify how the PLM system will affect workflows, roles and responsibilities, evaluate the organization’s readiness for change including the technical and cultural aspects. Lastly, identifying potential sources of resistance and developing mitigation strategies.
* **Developing a comprehensive change plan:** roll-out system to manage risks, set realistic milestones for each phase and ensure sufficient resources are allocated to the project.
* **Communication and feedback mechanisms:** providing channels for employees to ask questions, share concerns and offer suggestions
* **Training and support:** offering comprehensive training sessions for different employees based on their roles, setting up help desks and designated change champions to assist during the transition. Also providing user manuals, video tutorials and FAQs.
* **Monitoring and measuring progress:** tracking progress using metrics like user adoption rates, system efficiency and process efficiency improvements.
* **Reinforcing the change:** recognizing and rewarding teams or individuals for successful adoption and achievements.