

Digital Strategy Roadmap for Pro Clean Enterprises

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1. Introduction

Digital Transformation (DT) is a crucial metamorphosis for any organization to understand and undergo for achieving quality improving and time optimizing results. There exists a technical definition for DT, the Chartered Institute of Procurement & Supply (CIPS) defines "digitalisation" or "Digital Transformation" as the practice of redefining models, functions, operations, processes and activities by leveraging technological advancements to build an efficient digital business environment – one where gains (operational and financial) are maximised, and costs and risks are minimised.

Legacy Organisations that have a long rich history, such as the Pro Clean Enterprises, understand the importance and significance of *change & technology*. PCE grew their market range from domestic cleaning products to efficiency oriented cleaning appliances for residential and business settings in the last 60 years. They have built about 200 retail stores and more recently, a nascent e-commerce business. A major portion of PCE's customers are small businesses, followed by an almost equal share of large & small homeowners. Their product sale revenue is primarily driven through Retail Stores (45%), Catalog/Mail-Order Sales (35%) & a stably growing E-commerce sector (20%).

However, PCE has been seeing a slow decline over the past 3 years in their total revenue (5% decline in comparison) and profitability has taken a downturn as well. The major factors contributing include outdated IT infrastructure, faulty manufacturing facilities and an overall non-optimized workflow within the organization. Therefore, a Digital transformation aligns appropriately with the organisation's interest in improving their financial targets using digital tools for long term benefits. This paper aims to delve deeper into the good parts, shortcomings & opportunities to improve and propose a digital transformation strategy along with a timeline chart with mitigations to any future deviations.

2. Current State Analysis of PCE

In order to understand the decline causing factors, it is necessary to establish a baseline measure in numerical value for comparison purposes. The net profit% and the Return on Investment for each channel was calculated. The numbers are as follows:

Channel	Historical Profit%	Present Profit%	Historical ROI (%)	Present ROI (%)
Retail Stores	6.8	4.68	60.71	36.48
E-Commerce	5.2	4.42	185.71	131.25
Catalog Sales	9.0	9.0	180.0	194.32

This sets a baseline for prioritizing where the immediate action must be taken. It can be noticed that Retail Stores have the highest decline rate as compared to the other two channels. This is due to the reduced footprint in certain stores and rising rent trends in major cities. E-Commerce also is slowly but surely following the trail of Retail Stores in declining revenue and ROI. This is due to the inefficiencies in the manufacturing to the supply chain management.

The traditional legacy systems and outdated machinery is costing dearly for the organization in both maintenance and optimization costs. Especially given the competition organization's advanced e-commerce and manufacturing segments, PCE's positioning is declining rapidly to say the least. Rivaling organizations, such as Amazon, Target, Walmart and CostCo, which have their own lines of cleaning appliances and cleaning products are direct factors against the E-Commerce segment.

In order to tackle this problem in a strategic approach, while also keeping the budget limit in consideration (2 years of up to \$20 million), It is suggested that 3 teams of fixed goals are to be formed:

1. IT Infrastructure Team (IT, Sales & All Automation)
2. Marketing & Relations Team (Customer Service, Marketing & HR)
3. Manufacturing Optimization Team (Manufacturing, Distribution & Supply Chain Management)

As much as the team titles split the segments they are responsible for, the teams are to be flexible, agile and cross-functional to enable the most efficient approach for brainstorming solutions & framing implementation plans. This is also to ensure that the teams can help each other in their downtime.

3. Solution Ideas

The solutions in this segment are in no priority order. They are to establish possible change measures for enabling Digital Transformation in PCE.

3.1 Solution 1: Lean Manufacturing, Automation & IIoT Production (IIoT-P)

- Objective: To tackle the inefficiencies in the manufacturing segment of PCE using the power of Automated Manufacturing Units in collaboration with IoT systems that keep real time information of the machine's condition and performance.
- Expected Outcome:
 - Improved throughput of the manufacturing unit
 - Reduced downtime & maintenance costs
 - Real time tracking of production performance
 - (Possible Future: Integration with AI for Predictive Analysis & Maintenance)

3.2 Solution 2: Blockchain-Integrated Inventory Management System (IMS)

- Objective: To tackle the manual distribution and supply chain management using Blockchain & AI integrated inventory tracking system, which collaborates with the IIoT systems on the manufacturing segment. This also foresees spikes in demand and problems down the supply chain through real time predictive analytics.
- Expected Outcome:
 - Reduced risks in inventory management
 - Reduced vulnerability to supply disruptions
 - Improved inventory management & procurement
 - Improved coordination between various warehouses & retail stores

3.3 Solution 3: Digital Marketing & Rewards (DM)

- Objective: To reduce the Catalog printing costs and focus on personalized product digital marketing based on sales data using Social Media & Applications, with included incentives through Rewards programs.
- Expected Outcome:
 - Increased customer satisfaction
 - Increased customer loyalty
 - Increased customer retention
 - Improved data-driven decision making capabilities for Product management
 - Reduced investment in Catalog printing

3.4 Solution 4: E-Commerce Development (ECD)

- Objective: To improve the rapidly growing revenue channel through branching off from major E-commerce platforms and developing an unique identity with tailored customer experience & enabling integrated online and in-store experiences for purchasing products.
- Expected Outcome:
 - Increased customer satisfaction
 - Increased customer loyalty
 - Increased customer retention
 - Improved data-driven decision making capabilities for Product management
 - Reduced reliance on competitors platform

3.5 Solution 5: Automation in Customer Service (AI-CS)

- Objective: To speed up the customer service response times using Automated Customer service through AI Chatbots trained to generate empathetic responses & transparent Self-Service portal to manage their orders.
- Expected Outcome:
 - Increased customer satisfaction
 - Increased customer loyalty
 - Increased customer retention
 - Improved data-driven decision making capabilities for Product management
 - Increased insight into customer behaviors for tailored experience

3.6 Solution 6: IT Infrastructure Reorganization (IT)

- Objective: To support all the data management and automated data driven analytics as well as AI and real-time information processing & visibility, appropriate IT infrastructure is to be implemented and diverse suppliers are to be contracted to ensure security & reduce any data lost through blockchain integration.
- Expected Outcome:
 - Improved Data Security & Agility
 - Improved functionality across all revenue generating segments
 - Improved Omnichannel experience on e-commerce platform & in-store shopping
 - Improved customer experience & retention

3.7 Solution 7: Retail Store Optimization (RSO)

- Objective: To tackle the rising lease rates & declining footprint among the select stores, a strategic shutdown procedure is to be implemented and the retained retail stores shall be integrated with improved customer service using omni channel functionality options as well as a study for understanding the customer behavior in the region to tailor their experience as such
- Expected Outcome:
 - Reduced maintenance costs for Retail Stores
 - Increased customer satisfaction
 - Increased customer loyalty
 - Increased customer retention
 - Improved data-driven decision making capabilities for Product management
 - Increased insight into customer behaviors for tailored experience

4. Prioritization & Justification

Certain key factors that were taken into consideration for finalizing the Roadmap were identified through budget provided and high stake problems of the client organization. It is noted that the declining trend has critical effects on the budgeting criteria as well as the urgency into identifying & mitigating the pain points of the client organization. The client organization has shown interest in approving \$20 million over a span of 2 years and further investment is to be expected after there has been an increase in profitability and reduced operational expenses in those 2 years. Therefore, the prioritization of the strategy has been framed as such that high impact & quick ROI solutions shall take the precedence then followed by delving into the high risk, high investment and high return segments of the roadmap.

4.1 Impact vs Investment

The biggest hurdle for the organization to cross is the investment that is required to enable all the change, followed by swaying the stakeholders and workforce to invest their time, efforts and skills into the shared vision of the transformation. Therefore, in terms of Optimal Investment vs Impact based solutions:

1. RSO
2. AI-CS
3. DM
4. ECD
5. IMS
6. IIoT-P

This is to ensure that there is visible return on investment in the initial couple of months, that could be later invested into the subsequent solutions for higher improvement in functionality. It is also to be noted that IT takes equal priority in all stages, therefore it is a part of every solution step.

4.2 Risk & Market Opportunity

The biggest risks that could potentially affect the client organisation during the process of DT are:

- Unexpected extended Manufacturing Unit Downtimes
- Legacy System Compatibility issues
- Cybersecurity issues
- Possibility of exceeding project budget
- Employee Resistance to Change
- Vendor and Supplier delays for IT PaaS
- Time Constraints
- Solution scalability & adaptability issues

While these risks continue to be a hurdle that needs to be considered with extreme caution, crossing these could prove highly beneficial through market opportunities and branding through the innovation that follows after a hard yet successful implementation. Such as:

- Possible partnerships with tech providers
- Expansion into data safety stringent markets as a secure & trusted brand
- Partnerships that lead to a diversified revenue stream
- Upskilling Employees and improving customer experience
- Early adoptability of future tech through scalability & flexibility
- Exclusive premium product lines through customer loyalty programs
- Expansion into Service and Tech Education segment for Customers

4.3 Considerations taken into account

Every organization that undergoes a Digital Transformation is to foresee a certain percentage of their native employee population to be dissatisfied or not very inclined to the vision of the long & tumultuous transformative journey of the organization. This applies to the customer spectrum of reactions as well. Therefore to achieve the best overall positive agreement, a certain set of considerations must be understood and met. Such as:

- Customer Experience & Satisfaction is the key
- Employees are the driving force of the organization
- Happy workforce is the easiest to work with and put in their hardest of efforts

- A Good leader always unites the workforce under the shared vision, and shall try their best to be inclusive of everyone
- Continuous small step improvement yield the best long term results
- Client Organization's pain points are to mitigated optimistically with no downtime in the current process

4.4 Final Priority List

Therefore, upon consideration of all the prior factors and risks, the final Priority List is as follows:

1. RSO
2. DM
3. AI-CS
4. ECD
5. IIoT-P
6. IMS

5. DT Strategy & Roadmap

5.1 Brief Outline

The primary focus of DT Strategy for PCE works on improving customer satisfaction, digitalising operations and setting up room for future-proof technologies while improving the profitability of the organization. The stage wise replacement and improvisation of legacy systems and traditional work methodology are not just for prioritising the organisation's growth but also to enable and leverage the usage of AI tools, data-driven automation & analytics, as well as customer-centric e-commerce & in-store engagement. This is to perform a holistic reformation of the organisation to expand their market reach while also rivalling the competitor's market.

Therefore, in summary, the Key Objectives include:

1. Improving Customer Engagement & Retention
2. Improving Operational Efficiency
3. Improving E-Commerce Segment
4. Improving Employee Retention & Skills
5. Future proofing the new operation methodologies put in place

5.2 In-detail Timeline

Based on the priority list of the solutions, The proposed timeline is divided into 4 Phases over the period of 2 Years with a rough cost estimate per phase. IT infrastructure reorganization is to be followed through through all the phases in accordance with the data analytic necessities. A pre-preparation time for about *4 - 6 months* will be necessary to conduct a market study for optimal technology suppliers for the DT Strategy.

5.2.1 Year 1 (Phase 1 & 2): Work Motto: “*Laying foundation for the Future*”

- Phase 1: (Year 1: Months 1 - 6)
 - **RSO:** Initiating the strategy through scheduled shutdowns and workforce reorganisation. Resource reallocation & optimization. Implementation of Omnichannel capabilities in the retained Retail Stores to improve store performance and reduce maintenance costs.
 - **DM:** Strategic shut down of Catalog segment to reallocate the resources into customer centric Digital Marketing campaigns through Social Media, Official Website and Applications. Introduction of Rewards program to encourage customer loyalty.
 - **AI-CS:** Deployment of AI-Chatbots for customer support and an improvised self-service portal to address customer needs and queries and improve customer satisfaction through high response times. This is also to ensure a reduction of human workforce in Customer Support and relocate them into appropriate work segments.
- Phase 2: (Year 1: Months 7 - 12)
 - **IT Centric Developments:** High focus on improving IT infrastructure and transition from legacy systems to modern systems for optimized performance, reliability, scalability and future ready platforms. This is also to ensure and establish a foundation for the future phases.
 - **ECD:** Development of a standalone e-commerce platform with customer tailored shopping experiences, integrated with retail stores for an omnichannel experience.
 - **IMS - Stage 1 for ECD:** Initial deployment of Blockchain integrated IMS for tracking of E-Commerce related inventory and supply chain visibility to optimize any disruptions.

5.2.2 Year 2 (Phase 3 & 4): Work Motto: “Future readying the Present”

- Phase 3: (Year 2: Months 1 - 6)
 - **IIoT-P:** A strategic downtime for reworking the Manufacturing units for improved and new IoT-ready machines that enable real-time monitoring and predictive maintenance. This would enable improved throughput and reduce machine downtime.
 - **IMS - Stage 2 for IIoT-P and Retail Stores:** Second phase IMS deployment to expand visibility over the new and improved manufacturing facility and inventory capabilities, along with Retail Store performances. This is to enable real time analysis of inventory and optimize in accordance with predicted demand in the market.
- Phase 4 (Year 2: Months 7 - 12)
 - **Feedback Studies:** In order to improvise on the implemented solutions and conduct KPI studies such as ROI, Operational Efficiency & Expenses and Customer Satisfaction across revenue segments.
 - **Scalability Operations:** Plans for expansion into AI driven decision making platforms for predictive analytics in Marketing & Manufacturing segments.

5.3 Mitigation for future deviations

As discussed in Section 4.2, There exists a lot of possible deviations for the solutions. Here is a mitigation plan for possible deviations:

- Unexpected extended Manufacturing Unit Downtimes:
 - A phase wise machine replacement plan in order to ensure a certain portion of the manufacturing machines remain operational while the others get replaced on a strict yet agile timeline.
- Legacy System Compatibility issues:
 - A pilot phase to test integration points and iron out any compatibility issues before full implementation. Use modular integration to allow for flexibility and adjustments.
- Cybersecurity issues:
 - Enabling a thoroughly strict Zero-trust policy and 2FA during the transition phase would reduce the risks, offering a Cybersecurity Insurance plans would also help mitigate the financial impacts in case of a breach.
- Possibility of exceeding project budget:
 - Monitor budget utilization monthly, especially during the implementation of high-investment solutions like IIoT-P and IMS.
- Employee Resistance to Change:
 - Provide continuous training, and implement change management programs to ensure employees understand the benefits of the transformation. Offer incentives

for early adopters and create champions within departments to encourage adoption.

- Vendor and Supplier delays for IT PaaS:
 - Diversifying the vendor base would reduce reliance on a singular vendor for key services on IT infrastructures, as well as, establishing Service Legal Agreements in order to enable accountability for all parties with implied consequences of penalties.
- Time Constraints:
 - Adopt an agile project management approach to handle delays flexibly and break down the project into smaller, manageable phases. Maintain frequent communication with vendors to ensure timely delivery.
- Solution scalability & adaptability issues:
 - Scalability testing before complete implementation of new technologies is to be conducted as well as, maintaining a modular approach to the project to ensure easy expansion over time to add more flexibility and features. An established yet flexible Roadmap for future projects needs to be implemented to ensure further scalability.

5.4 Impact & Change Management

5.4.1 Impact:

There are various key impacts of digital transformation on PCE. These are as follows:

- **Operational Efficiency:** With automation, IoT, and blockchain in place, PCE would be able to reduce operating costs, increase manufacturing throughput, and have optimized inventories. This would lead to better profit margins, optimized downtime, and a responsive supply chain.
- **Customer Experience:** The shift into digital marketing and AI-driven customer service will offer personalization, speed, and responsiveness to PCE customers. The omnichannel experience will also enhance satisfaction, helping increase customer loyalty and retention.
- **E-Commerce Development:** A significant growth would be visible in PCE's e-commerce channel, benefiting from a unique platform that offers tailored customer experiences, improving market share and reducing reliance on third-party platforms.
- **Employee Engagement:** Continuous training and involvement in the process will empower the workforce, which is ready to adapt to new technologies, enhancing overall productivity and reducing resistance to change.

5.4.2 Change Management:

The success of the digital transformation will depend on effective change management. The following strategies will help ensure smooth transitions:

- **Leadership and Communication:** The leadership should be strong enough to unite the workforce under one vision. Communication with respect to the benefits and 'whys' of transformation will help clear the air of any communication gaps.
- **Employee Engagement:** Engaging them in the process of transformation through frequent updates, training, and feedback will develop a sense of ownership and minimize resistance. Incentives on the successful adoption of new systems and processes will motivate employees.
- **Continuous Improvement:** Continuous feedback loops of both internal employees and customers will refine the solutions on an ongoing basis. In so doing, it will help ensure the transformation is relevant to the goals of PCE while responsive to evolving needs.

5.4.3 Associated Investments

Solution	Estimated Investment (Millions of USD)	ROI Timeline
RSO	1-2	Immediate to 6 Months
AI-CS	0.5-1	6-9 Months
DM	1-2	6-12 Months
ECD	3-5	12-18 Months
IIoT-P	4-5	18-24 Months
IMS	3-4	18-24 Months
IT	2-3	Ongoing

Therefore,

- Phase 1 Budget estimates around \$4 - 6 Million
- Phase 2 Budget estimates around \$6 - 8 Million
- Phase 3 Budget estimates around \$6 - 8 Million
- Phase 4 Budget estimates around \$2 - 3 Million

With a 10% emergency buffer budget (approx. \$2 Million over the \$20 Million), The best case scenario the DT Strategy Plan would estimate up to \$18 Million and a worst case scenario

estimates around \$25 Million, of which the budget could be made with the help of ROI from Quick Return solutions.

6. Conclusion & Potential Future Investments

6.1 Conclusion

PCE finds itself at a very crucial juncture, and the requirement for digital transformation goes beyond just operational efficiency—but becomes an imperative to not only recover competitive advantage but secure sustainable, long-term growth. The above transformation strategy is focused on high-impact, quick ROI solutions in the early phases, such as Retail Store Optimization (RSO), AI in Customer Service (AI-CS), and Digital Marketing & Rewards (DM), to ensure that PCE can start seeing some tangible benefits within the first year.

The first successes will lay the foundation for follow-up investments in more complex solutions, including E-commerce Development (ECD), IIoT Production, and Blockchain-integrated Inventory Management (IMS). This progressive approach will ensure that PCE uses its budget of \$20 million effectively to allow measurable improvements while creating a sustainable and scalable transformation.

More than that, the base of the plan will still be based on staff engagement, customer experience, and data-driven decision-making in order to emphasize the aspects of staff empowerment and constant customer satisfaction improvement. With effective change management and by following a clear roadmap, PCE is well on its way to address the current challenges and further grasp future market opportunities in the digital space.

The successful implementation of this digital transformation initiative will likely strengthen PCE's profitability, competitive position, and create a platform for further growth in an increasingly dynamic market space. All revenue generating segments are expected to see about 20 to 25% increase in profitability, while opening opportunities to more diverse markets such as Services and Partnerships, at the end of the 2 years span of DT Plan.

6.2 Potential Future Investments

After the initial two years of transformation, the company will likely experience increased profitability, improved operational efficiency, and enhanced customer satisfaction. These improvements will create opportunities for further investment to scale up PCE's digital capabilities. The promising markets that open up a room for growth include:

1. Advanced AI-driven Predictive Analytics
2. New IT Infrastructure based Markets
3. Expansion of Blockchain for Cybersecurity, Supply Chain Transparency, Brand Trust & Anti-Fraud
4. Augmented Reality integrated Omnichannel Experience
5. Expanded Markets into Service & Tech Education for Customers
6. Premium Product Lines for Customer Loyalty Rewards
7. Sustainability Initiatives

6.3 Key Performance Indicators

Solution	KPI	Target/Goal	Measurement Frequency
Retail Store Optimization (RSO)	Operational Cost Reduction	Reduce retail store maintenance costs by 20% within 6 months.	Monthly
	Sales per Square Foot	Increase sales per square foot by 15% in optimized stores.	Quarterly
	Customer Satisfaction (CSAT) Score	Improve by 10% in stores with enhanced omnichannel services.	Quarterly
AI in Customer Service (AI-CS)	Customer Query Resolution Time	Reduce average query resolution time to <1 minute.	Monthly
	Call Deflection Rate	Handle 50% of customer queries via AI/chatbots.	Quarterly
	Customer Satisfaction (CSAT) Score	Achieve a CSAT score of 90% for chatbot interactions.	Quarterly
Digital Marketing & Rewards (DM)	Customer Retention Rate	Increase retention rate by 10% within the first year.	Quarterly
	Loyalty Program Signups	Achieve 50,000 new signups within 12 months.	Monthly

	Marketing Cost per Acquisition (CPA)	Reduce CPA by 20% compared to catalog campaigns.	Quarterly
E-Commerce Development (ECD)	E-commerce Revenue Growth	Increase direct e-commerce revenue by 25% in Year 2.	Monthly
	Conversion Rate	Achieve a conversion rate of 5% within the first 12 months.	Monthly
	Average Order Value (AOV)	Increase AOV by 15% through personalization features.	Quarterly
Lean Manufacturing & IIoT-P	Downtime Reduction	Reduce unplanned downtime by 20% within 18 months.	Monthly
	Production Efficiency (Output per hour)	Increase output by 15% within 24 months.	Quarterly
	Maintenance Cost Reduction	Lower maintenance costs by 25% within 24 months.	Quarterly
Blockchain-Integrated IMS	Stock-out Incidents	Reduce stock-outs by 30% within 18 months.	Monthly
	Inventory Turnover Rate	Increase turnover rate by 20% in 2 years.	Quarterly
	Supplier On-time Delivery	Improve on-time delivery to 95%.	Quarterly
IT Infrastructure Reorganization (IT)	System Downtime	Reduce IT system downtime by 50% within 12 months.	Monthly
	Data Accessibility	Achieve real-time data visibility across all departments.	Quarterly
	Cybersecurity Incidents	Reduce incidents by 30% within 2 years.	Quarterly

Appendix: References

This paper includes study inferences & inspirations from various DT frameworks, Risk Management, IT Infrastructure suppliers, Cybersecurity Solution providers and other related areas.

Some of which include:

- McKinsey & Company
- Deloitte
- Gartner
- Chartered Institute of Procurement & Supply (CIPS)
- NIST Cybersecurity Framework
- ISO/IEC 27001
- AWS
- Azure
- Google Cloud
- Scrum
- Kanban

Appendix: Reference Figures

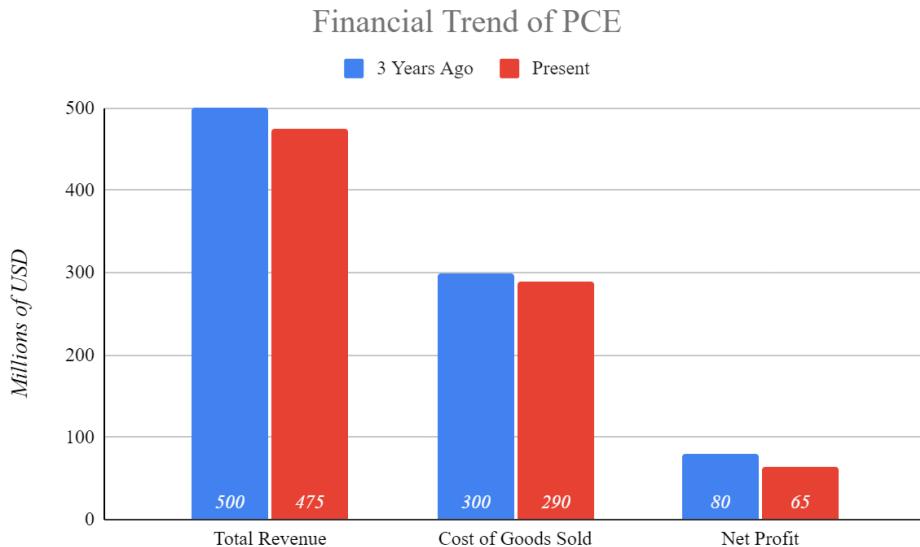


Figure 1: Financial Trend of PCE

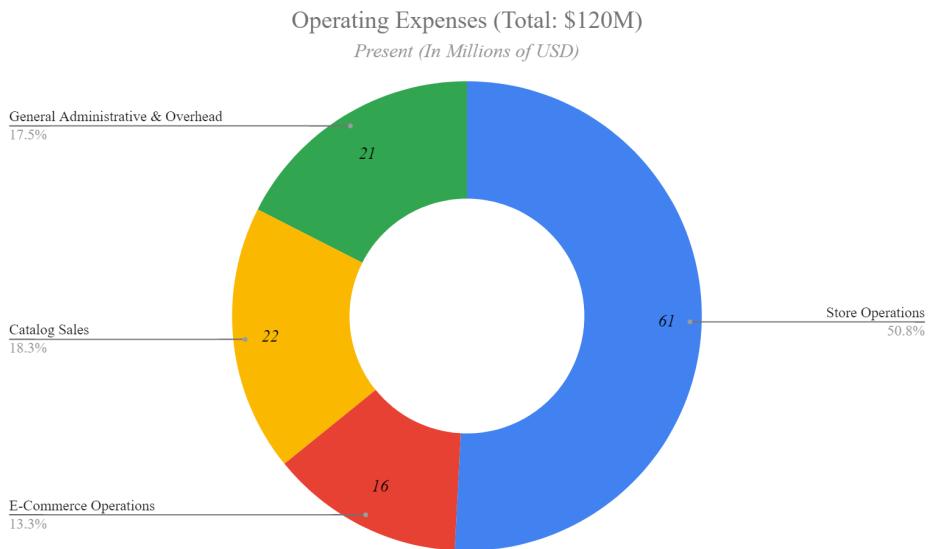


Figure 2(a): Operating Expenses: 3 Years Ago

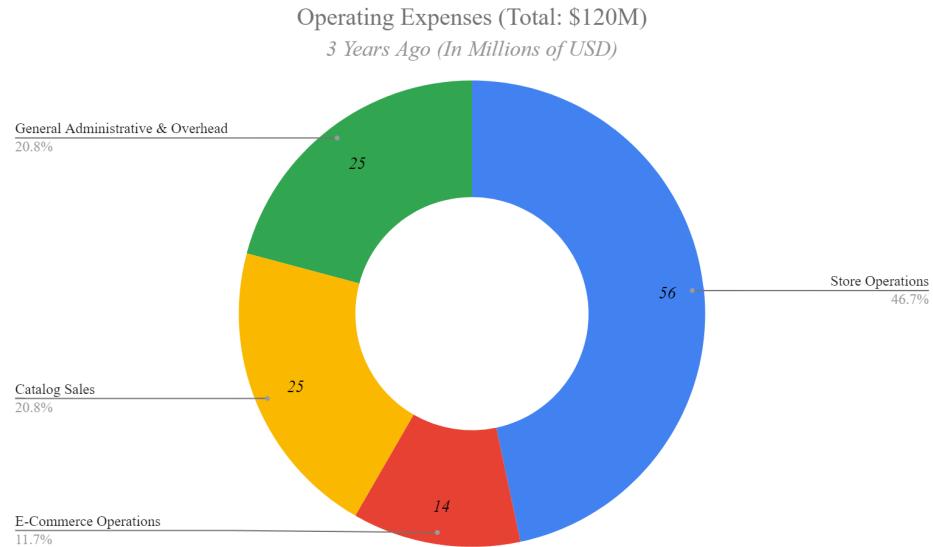


Figure 2(a): Operating Expenses: Present

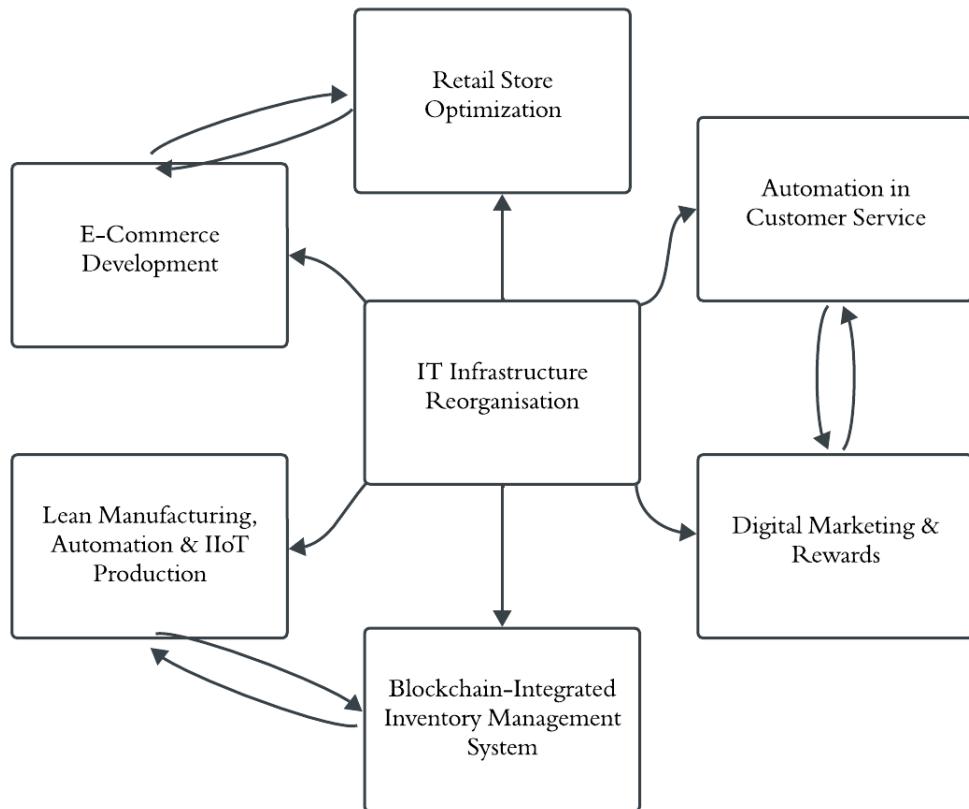


Figure 3: Interrelationship within Solutions

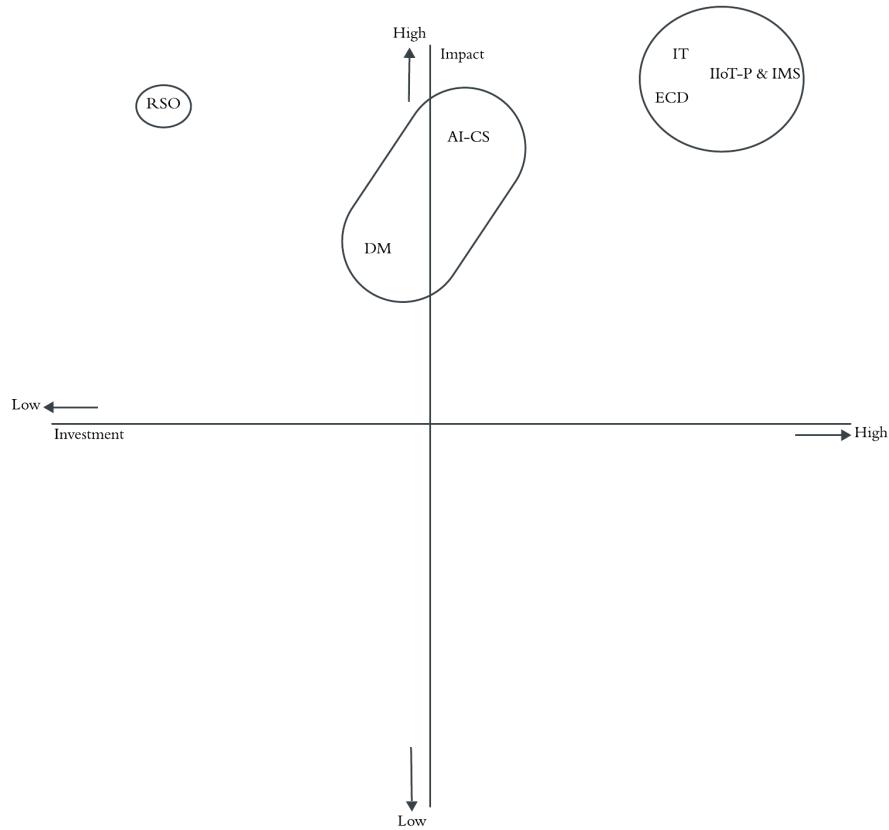


Figure 4: Investment vs Impact Matrix