Digital Modernization by Upgrading Industrial Machinery, Business Processes and Services

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Abstract: *The article aims to explore to provide an informative overview of the topic for Digital Modernizationfor the companies which are facing challenges with outdated technology systems and processes or struggling to keep up with changing customer expectations, digital modernization may be a good starting point. Such an approach would help keep the technical infrastructure in the green, leading to process improvements, efficiency gains, and reduced operational cost savings. Provides high level overview of benefits of upgrading Industrial Machinery, Business Process and Services as part of Digital Modernization and how it can positively impact business performance as seen by Rayasam Venkata Lakshimi Manohar as an individual, his thoughts and opinions are his and not necessarily those of his employer. With the recent ever evolving trends in technology for industrial landscape, the scope for the companies to invest in the future of their operations and witness the business performance has increased. The upgraded Machinery and business processes are equipped with advanced technology to predict the performance and automated features, allowing for smoother and more efficient ways. Modernized industrial machinery and digitalizing the business processes and services can attract more clients, boost customer loyalty and helps the top management in positioning the business as a global leader in industrial segment. It is suggested that companies look to the DIRECT project leadership framework that helps in leading projects on digital modernization based on competitive edge, performance and safety smooth transition. In today's world where the innovation drives the success, staying up to date with modernized industry machinery, business process and services is essential for business looking to thrive in the ever-expanding market. This does not delve into specific technical details or case studies. It serves as a starting point for readers interested in exploring the benefits of Digital Modernization by modernizing Industrial Machinery, Business Process and Services.*

Keywords: Industrial Machinery Upgrade, Business Performance Boost, Benefits of Upgrading, Enhancing Industrial Efficiency, Strategic Investment, Maximising Efficiency

1. Introduction

In the current fast-paced and highly competitive business landscape, companies are constantly seeking ways to improve their operational efficiency and stay ahead of the curve. One area where companies are seeing significant advancements in recent years is Digital Transformation and Digital Modernization.

"*Digital Transformation*" refers to the fundamental change in business operations and processes brought about by adopting digital technologies. The process entails the integration of digital technologies into all verticals of a business, leading to fundamental changes to how the business operates and delivers value to customers.

"*Digital Modernization*" refers to the updating or upgrading of existing technologies to newer, more efficient versions to improve the overall performance posture. It involves implementing new technologies to drive a step-change in the efficiency and productivity levels of a business without necessarily pushing changes to the predetermined models or strategies.

Digital Transformation is a more comprehensive and holistic change, whereas Digital Modernization is more focused on improving specific technological aspects.

Digital transformation is a broader concept that encompasses many different initiatives, including digital modernization.

Some organizations may only emphasize modernizing their digital systems and processes as part of their Digital Transformation efforts, referring to the initiative as Digital Modernization instead.

Digital Transformation has a much bigger scope in the current era and there is a definite scope for Digital Modernizationin Industries for sustainable business growth. The roadmap for Digital Modernizationin an industry varies depending on how company'scurrent digital infrastructure is and ultimately what level of modernizationis best suited. However, the move to an advanced level of data-driven decision making is preeminent across all industry sectors. To excel in their competitive edge, businesses must get on the smart track to modernize their Industrial Machinery, legacy systems, business processes and services, both from Information technology (IT) and operational technology (OT) perspective. Thereby better leveraging Manufacturing Operations Management.

2. Purpose of Study

The Purpose of this study is to showcase the scope and benefits for Digital Modernization by upgrading Industry Machinery, Business Processes and Services. Additionally, this study provides insight on DIRECT project leadership framework that helps in understanding steps involved in leading projects on digital modernization based on competitive edge, performance and safety smooth transition. The findings of this study can serve as a guide for organizations seeking to embark on their Digital Modernization journey. By

implementing the identified DIRECT approach companies can improve their competitiveness agility and sustainability in digital era.

Research Problem Statement:
The research problem for this study is to bring awareness on the scope of Digital Modernization by upgrading Industrial Machinery, Business Processes and Services

Specifically, this study will examine the following research questions:
1) What is Digital Modernization?
2) What are the benefits of Digital Modernization by upgrading Industrial Machinery, Business Processes and Services?
3) How do we effectively lead projects on Digital Modernization?

Approach:

To achieve the objectives a comprehensive literature review was conducted to gather information on the current state of Digital Modernization and best practices. The findings highlight the significance and impact of Digital Modernization on Industries and provide insights into effective strategies for implementation.

Digital Modernization:
"Digital Modernization" refers to updating or upgrading of existing systems and technologies to newer, more efficient versions to improve the overall performance posture. It involves upgrading to new machinery and business processes backed up with latest technologies to drive a step-change in the efficiency and productivity levels of a business without necessarily pushing changes to the predetermined models or strategies.

Impact of Digital Modernization on Business Performance by upgrading Industrial Machinery, Processes and services
Imagine a scenario where your Machinery in a manufacturing unit runs with fewer disruptions and better efficiency than you had before. With modernized upgraded equipment, data and processes, this can be your reality. Streamlined processes, enhanced automation, and improved real time information are just a few of the benefits companies can expect. Allowing Companies to better meet customer demands and expectations.

The modernization of Industrial Machinery, processes and services brings a host of benefits. Outdated machinery may consume more energy and require more frequent maintenance routines than new or modernized equipment, leading to higher operational costs and lowered equipment efficiency. By upgrading to modern equipment, companies can reduce energy consumption, minimize maintenance expenses, and optimize resource utilization. Similarly streamlining and digitalizing the business processes and services will reduce redundancy in work, ease of operation, more transparency and quick turnaround time. This translates into efficiencies for your

business, enabling you to allocate resources towards other critical activities.

The impact of modernization on employee morale and satisfaction cannot be underestimated. By providing them with modern, user-friendly machinery and processes, companies can improve employee engagement. Increased job satisfaction and motivation lead to improved overall performance and a positive work environment, leaving employees feeling valued.

In Supply Chain industry there are many industrial machineries pertaining to respective line of business starting from Raw Material, Manufacturing, Distribution, Logistics and services to meet their customer needs. To illustrate the positive impact of modernizing equipment, let's consider the example of a manufacturing company.

Before Digital Modernization
In some of the manufacturing companies' capital equipments like machinery may be old, inefficient, and prone to breakdowns. This can lead to delays in production of finished products and goods, decreased productivity, and increased maintenance costs. Moreover, outdated machinery without proper safety features may put operators and other employees at risk working on the shop floor.

After Digital Modernization
By modernizing machinery with newer models, the customers can experience several benefits. The upgraded machinery from renowned companies are equipped with advanced technology in PLC / SCADA systems to predict the breakdown and automated features, allowing for smoother and more efficient ways. This leads to increased productivity, faster turnaround times, and reduced labor costs. Additionally, some of the modern machineries are coming up with Industrial remote monitoring systems which helps in enhancing industrial safety, optimizing operational efficiency by predictive maintenance, data driven decision making and remote access and control features.

Benefits of Digital Modernization by Modernizing Industrial Machinery, Business Processes and Services
1) **Technology Advancements:** The Machinery, business process and services associated in an industry are witnessing a remarkable transformation with the help of rapid advancements in technology. Traditional Industrial Machinery equipment and manual processes and services are being replaced by state-of-the-art, modernized equipment and processes that offers enhanced safety, efficiency, and reliability. By embracing these technological advancements, businesses in the industry can elevate their performance to new heights.

2) **Increased Performance and Efficiency:** Outdated industrial equipment, business processes and services often hamper productivity and efficiency, leading to increased downtime and maintenance costs. Modern machinery, processes and services supported by Technology are designed to perform tasks more

efficiently, reducing downtime and increasing output. Upgrading the old equipment and business process that are backed up by latest technology can significantly enhance performance and efficiency levels.

Example:
With the modernization of industry equipments and business process in the elevator industry, businesses can experience a boost in efficiency and performance. Areas of Modernization in Advanced control systems, energy-efficient components and predictive maintenance capabilities, Digitalizing and integrating the Manufacturing, Procurement, Sales, Inventory, Customer service processes and Services through ERP might ensure smooth operations, optimized energy consumption and minimal disruptions.

3) **Improved Functionality:** The latest equipment and digitalized business processes often come with more advanced features with technologies that can improve the experienceof products or services. Having latest equipment and technology processes can gain higher customer satisfaction and increased competitiveness in the market.

4) **Operational Cost Savings:** The investment in modernizing Industrial Machinery, business processes and services are repaid through the deployment of the latest technology often times more efficient, reducing effort spent in completing a task, and reduces maintenance obligations.
    Example:
    a) Predictive maintenance helps to reduce downtime and extends the lifeof the equipment.
    b) The enhanced features and performance of modernized machinery attracts more customers will lead to increased revenue and a higher return on investment for businesses.
    c) Real-time monitoring allows businesses to identify energy wastage and implement measures to optimize energy consumption. This can result in cost savings over a period.

5) **Improved Safety and Risk Mitigation:**Modernized equipment with Industrial remote monitoring plays a pivotal role in enhancing safety measures and mitigating risks within industrial environments:
    Example:
    a) Early Hazard Detection: Live monitoring industrial systems continuously monitor key parameters such as temperature, pressure, and emissions. Any deviations from safe levels can trigger immediate alerts, allowing for prompt action to prevent accidents or hazardous situations.
    b) Occupational Health and Safety: By remotely monitoring industrial environments, businesses can minimize the exposure of workers to potentially hazardous conditions. This proactive approach helps

reduce the risk of occupational accidents, injuries, and health issues.

6) **Operational Advantage**:By Modernizing industrial machinery with latest technology, businesses can optimize their operational efficiency:
    a) Predictive Maintenance: Will be having scope to Monitor industrial equipment in real-time enabling predictive maintenance practices. By tracking equipment performance, businesses can identify potential issues before they lead to costly breakdowns. Proactive maintenance scheduling minimizes downtime, maximizes uptime, and might extend the lifespan of critical machinery.
    b) Process Optimization: Real-time monitoring allows businesses to identify inefficiencies or bottlenecks in their industrial processes. By analyzing the data collected, businesses can make data-driven improvements, streamline workflows, and optimize resource allocation for maximum productivity.

High level Industry Equipment/ Business Process Modernization Checklist:
- Assess the current state of industrial equipment and or Business Processes
- Identify areas of modernization and prioritize them based on their impact on business performance (Ex: Performance, Safety and competitive Edge etc.,)
- Develop a plan for modernizing equipment, including budgeting Cost Benefit analysis and scheduling.
- Prepare the performance optimization checklist by identifying bottlenecks and areas for improvement. Select modernization options that can enhance equipment or business performance.
- Research and select modernization options that align with industry standards and regulations.
- Implement the modernization plan, ensuring proper installation and testing of the upgraded equipment.
- Ensure that proper change communication with necessary training has been done.
- Monitor and realize the step change done by modernization on business performance, including increased efficiency, and reduced downtime.

For Modernizing the Industrial Machinery, digitalizing the business processes and services, it is suggested that companies look to the detailed management approach like DIRECT project leadership framework that helps in defining step wise approach starting from identifying opportunity for modernization till completion of project based on Competitive Edge, Performance and Safety smooth transformation.

DIRECT project leadership framework was developed by Daniel Stanton who is an Expert in Supply chain Strategy and Project Management. The DIRECT framework focuses on six key leadership pillars: Define, Investigate, Resolve, Execute, Change, and Transition. For more details on DIRECT

leadership,you can refer Daniel Stanton training on DIRECT leadership.

Leading such a type of Digital Modernizing project involves being able to structure teams and plans effectively. The key techniques needed to adopt an efficient approach using the DIRECT project leadership framework were explained below. It helps to understand how to define the scope, investigate options, select a course of action, execute a plan, how to revise processes and help people transition with change. Projects large and small can benefit—from enhancing platforms and launching new products to replacing outdated procedures.

DIRECT Project Leading Framework

1) **Define:** Define the Vision by understanding the problem or opportunity that modernization is going to address along with the benefits that will be realized.
   a) Document the modernization scope with a project charter.
   b) Rightly define the problem or opportunity and arrive at a vision. It is important that a proper root cause analysis is done. Root cause analysis can be carried out by 2 techniques are Fishbone diagrams which is more a visual exercise and 5 whys is a verbal exercise. However, documenting the reasons of 5 whys will be of great help in understanding the root cause of the problem.
   c) Brainstorm the problems, opportunities and benefits associated with the modernization project and come up with the affinity diagram.

2) **Investigate:** It is important that companies should investigate before taking a decision in starting a modernization project. Below are a few points which can help in performing necessary investigation on the project.
   a) Perform the SWOT Analysis which can help in explaining the strategic forces (Strengths, Weakness, Opportunity and Threat)
   b) Avoid group thinking, challenge the Assumptions and think about the alternatives.
   c) Have the Process Mapping document ready, which will help in understanding the processes involved and where the handoffs occur. Explore the options below depending upon the type of processes that need to be mapped.
      - Flow charts – Depicts the sequence of steps in a process,
      - Swim lane Diagram - Shows the process steps in the order which it comes and will organize accordingly who is doing which step and at which point.
      - RACI Matrix (Responsible, Accountable, Consulted, Informed) – Helps to understand the roles and responsibilities of a members of the team.
      - SIPOC (Suppliers, Inputs, Process, Outputs, Customers) – This helps in mapping the flow of Money, Material or Information from a supplier through some process to one or more Customers.

   d) Explore the benefits of having contractors and consultants from outside the company into the modernizing team. Also explore the ways to effectively engage the employees, contractors and consultants in the modernization project
   e) Get the Request for Proposal (RFP) from various companies and identify the right partner for the modernization project and get into Master Service Agreement (MSA) or Statement of Work (SOW) depending upon the complexity and nature of the modernization project.
   f) Perform the financial analysis of the modernization project using.
      - Net Present value (NPV): Calculate NPV using Annual cost, Annual Earnings and Expected rate of Inflation. The higher the NPV the more beneficial the modernization project.
      - Return on Investment (ROI): ROI compares the amount of project that would be earned to the amount of project that would cost and gives a percentage increase in value. A project with positive ROI is profitable.

3) **Resolve:** Resolve to a course of action in building a realistic plan for the modernization project.
   a) Identify the relevant stakeholders, Business owner, Project Manager, Product owner and team required for the modernization project.
   b) Depending upon the complexity of the Modernization projects and the projects in pipeline in the company, company must hire a Project Management consultant on a contract basis or setup a Project Management Office (PMO) or even look for a hybrid model of having employees in PMO office and project management consultants.
   c) Minimize any misunderstandings among the team members and ensure that the team is motivated by having Team building activities from early stage of the project itself and ensuring trust and transparency among the team members.
   d) Ensure that the project communications are legitimate and done within the timeframes with relevant stakeholders and team. While sending any communication one should ensure to validate that
      - Who is the Sender?
      - Who is the Receiver?
      - What is the Message?
      - When do they need it?
      - What is the best way to share it?
      - Identify and escalate any issues or risks that are noticed.
      - Create and manage the project plan in a timely manner. Make use of the following in managing the projects:

- o Work breakdown structure (WBS): WBS shows a logical structure of the work. It is a numbered list for the activities and the deliverables.
- o Gantt Chart: This shows the work breakdown structure with the timelines.
- o Network diagram: Shows the activities in a box or arrow between the boxes. This helps us to understand what all the activities that are contributing to the total time required for completing the modernization project. The series of activities, the one that will combine to take the longest to complete is called the critical path. Identifying the critical path is very useful in managing the project.
- e) Ensure that the project metrics are captured and updated accordingly. Project Metrics are captured on Schedule, Budget and People

4) **Execute:** Execute the project plan as per the agreed timelines and focus on communication, Metrics and Issues.
   - a) In case of any change in the scope of the project then it has to be managed properly. Putting Scope, Time and Cost in the three dimensions of a triangle are called Triple constraints. Triple constraints are interconnected and Focusing on the changes to the Triple constraints and the tradeoff between them is important.
   - b) Ensure that the Project Kickoff happens with relevant stakeholders when the activities included in the project plan are ready to be started. The project kick off should focus on
     - The project purpose and goals,
     - Team structure and their roles and responsibilities,
     - Schedule of the Project,
     - Communication plan,
     - Scope change management process and
     - Issue resolution process.
   - c) Have a risk registry and have the risk mitigation updated for the risks and issues identified.
   - d) Ensure that the project status is updated frequently as presented to the steering committee on a regular basis.

5) **Change:** Change Management plays a major role in overall project success.
   - a) Document the change.
   - b) Prepare relevant training material required for change.
   - c) Ensure that the change communication is happened to relevant stakeholders and users.
   - d) Prioritize the change in agreement with Product owner and Stake holders.
   - e) It is important that the key users are involved in user acceptance testing.
   - f) Collect the feedback from the key users on the modern systems, processes and discuss the same with the product owner and key stakeholders.
   - g) A punch list / Issue list is a way to track any outstanding issues or unfinished details. Any issues identified during the UAT or during development or unit testing phase has to be updated in the punch list, categorized and resolved based on the agreed scope of the modernization project.
   - h) Prepare the release readiness plan and communicate the Golive plan to respective stakeholders and users.

6) **Transition:** Transition is all about communicating the change as per the plan and ensuring that the modernized systems and processes are effectively used and supported.
   - a) It is important that the right people were identified for transition. Transition for users is required for understanding the need and operation of modernized machinery or business process or service. Transition Model comprises of 3 phases.
     - o Ending, losing, letting go
     - o The Neutral zone
     - o The New beginning
   .
   - b) Communicate before the change occurs. Feedback from the communication can help in identifying any potential issues and resolve them.
   - c) Communicate during the change.
   - d) Communicate after the change.
   - e) Prepare the transition communication plan based on the people who are going to be affected by the change. While sending the transition communication it is important to consider
     - Who is the audience?
     - What is the message?
     - Who is the sender?
     - How should it be delivered?
     - When should it be delivered?

   - f) Post Golive, it is important that the support team who will be supporting the modernized system or processes must be transitioned on the advanced features and supporting mechanism.
   - g) Ensure that the lessons learnt from the modernized project are captured and communicated to the rest of the project teams. Try to have a 2-hour workshop with the entire project team.
     - Ask everyone in the team to write down the good and bad lessons learnt.
     - Post the lessons and discuss.
     - Organize the lessons into categories or themes and put it in an affinity diagram.
     - Compile the lessons learnt and circulate it to the teams.

3. Discussion

Awareness on the scope and benefits of Digital Modernization is a critical factor for a successful digital strategy. By understanding the steps involved in DIRECT approach and involvement from top management, organizations can build holistic strategies that can focus on maximizing the value and helps in achieving both short term and long-term objectives.

Regardless of the approach taken, by embracing digital technologies for modernization is the only imperative to achieve the scale and rigor to combat market disruptions and remain competitive. However, without a clear line of thought and a well-defined plan, one's efforts may be rendered ineffective or wasted.

4. Conclusion

The modernization of industrial equipment, business processes and services can have a transformative impact on overall business performance with multiple advantages. By Modernizing Industry Machines, business processes and services with latest technological advancements can enhance safety measures, improve efficiency and performance, improved longevity. improve efficiencies and gain a competitive advantage. In today's world where innovation drives success, staying up to date with modernized Industry Machinery, business process and services is essential for businesses looking to thrive in the ever-evolving market.

5. Future Scope

Recent study on Companies behaviors towards product advancements states that the Companies are not relying on aging machines, processes and services that do not optimize productivity and may lead to increased downtime. Hence the scope for exploring and investing in the modernization of products and services is becoming prominent across the industry sectors. With the recent ever-evolving trends in technology for industrial landscape, the scope for Improving business value chains by improving and strengthening technology systems is increasing and the companies need to invest in the future of their operations and witness the increase in business performance.

Embrace the Digital Modernization by upgrading industrial equipment, business processes and service and elevate your business to new heights!

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