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### THE IMPLEMENTATION OF PRODUCT LIFECYCLE MANAGEMENT (PLM) IN PUBLIC ADMINISTRATION)

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#### ABSTRACT

PLM is mainly concerned with companies and private organization who having abundant resources, and their processes. In the era of administration, the PLM aspect of business processes has been continuously becoming an increasingly interesting topic, but the research is still scarce. Traditionally, product life management (PLM) has discussed mainly in the domain of product development and design, but the concept has evolved and expanded to include all the processes during the lifecycle of a product or process or lifecycle of a customer or people relationship. The product, process and the customer relation can see as the core of all business processes, and PLM brings these all together by enabling the integration of all process related information and applications. Despite of the bright prospects promised, various Public Administration organization in our country are facing big challenges regarding the organization management and service provision to people, if we introduce PLM in this domain it will really change the scenario in current Public Administration organizations and by implementing the PLM we can make significant progress in this account. Because the existing research has emphasized largely on company or industry focus we are never trying to see it on the account of public service industry in spite of lot of opportunity in this area. PLM brings these together by enabling the integration of all process and project related information in case of industry, it is very true as well for public organization also because after all they are also in one-perspective service industries which are providing varieties of services to general mass of people. So with the implementing PLM it is possible to provide our service in very short lead time to people which are prime need of this organization & by effective use of workflow and access management it is also possible to enhance the security as well as transparency in bureaucracy. Providing service to people quickly while assuring fool proof compliance is one of the biggest challenge facing by the public organization today. To address high pressures on limited resources and for huge demand PLM is best alternative. It is providing companies a low-risk, low-cost solution that can jump start their PLM journey why not to take benefit of the same technology to tackle social issue. Combining excellent PLM expertise and implementation methodology can help Public Administration system reduce time, resource demands, achieve high transparency as well as rapid benefits with PLM.

**KEYWORDS:** Product life cycle management, Teamcentre, Public administration .Organization, Security Management.

#### INTRODUCTION

Traditionally, product lifecycle management (PLM) has been discussed mainly in the domain of product development and design, but the concept has evolved and expanded to include all the processes during the lifecycle of a product or lifecycle of a customer relationship. The product process and the customer process can be seen as the core of all business processes, and PLM brings these together by enabling the integration of all product related information. Public Administration face big challenges in implementing the PLM ideology and they do not

always see the benefits of it, because the existing research has emphasized larger company focus. [1]

In the Public Administration, the PLM aspect of business processes can very easily fit, but the research is still scarce. Product lifecycle management in public organization is very crucial from the point of view of knowledge and information management in various areas. PLM seems to be a new approach for organizations to better manage their project management and service processes from start to end in project lifecycle. Especially in public service industry, managing process information through the

whole lifecycle it seems as an answer speeds up both the project development and delivery processes. In the last decade has seen a massive expansion in electronic ways of working across the entire world which can efficiently use along with PLM.

Today, the majority of work carried out on behalf of most of public administration Departments, non-Departmental public bodies and other public sector organizations is by electronically. This growth shows that public sector organizations employing a wide variety of data management system. This excessive dependence upon electronic media in itself leads to problems when it comes to information sharing, providing accountability for decision making, or replying to information legislation request. Records are most essential for the smooth operation of public organizations in pursuit of its function. If management, whether product, process or people, are not managed properly in public organizations are left unable to carry out business to provide accountability for decision-making, or deal with information requests. There are a number of drivers that necessitate the creation, collaboration and management within all public organization and agencies. So that's why there is very great need in this sector to manage whole system in such a way that it collaborate all different departmental functionality on some common plat form. The focus of the research work is on the challenges, benefits and requirements of implementing PLM in Public Administration.

### PROBLEM DEFINATION

**Case Study:-** BMC(Bombay Muncipal Corporation) is responsible for the civic and infrastructure needs of the metropolis including maintenance of roads, streets, flyovers, public municipal schools, water supply and purification, hospitals, street lighting, lighthouses, maintenance of parks and open local spaces, sewage treatment and disposal, garbage disposal, street cleanliness, registering of births and deaths in the city. BMC is one of the public administration organizations. The annual budget of BMC is 25,000 cr. BMC is public administration organization which having 42 different department which are geographically located in Mumbai city and suburban area in different localities and providing different services to 220 million customer (People).

It includes 22 main administrative departments and other external department like ministry of Maharashtra, Indian railway department, Mumbai police, reliance energy, MMRDA etc. for effective administration throughout Mumbai sub urban area. Most of the department of BMC are using various

type IT software (SAP /e-Governance portal /EXCEL /MS OFFICE /TALLY etc.) for automate their work process but still they are missing smooth coordination and smooth integration between different department which are located in different geographical area of Mumbai city and suburban area.

### PROCESS MAPPING AND GAP ANALYSIS

1. They are using e-governance system for managing different administrative application, still its scope is very limited because of not having effective project management system which collaborate different element of organization.
2. They don't have any sophisticated supervision and tracking system for project and because of absence of Activity management process there is lack of accountability towards work.
3. Acceptance of different document and then verifying and taking approval from different department by manual way quite labor some which are many time located far distance and previous bottleneck of files many time it consumes lot of time due to conventional System and lack of coordination and smooth cooperation between departments.
4. There is no proper security, supervising and tracking system for proposal so it becomes very difficult for the upper administration officer to locate position of proposal.
5. Due to conventional physical document storage system there is Lot of Data redundancy due to absence of centralized database system.
6. Here it seems to be innovation is always last thing to happen in organization due to absence of systematic change management system.
7. Enhance the process of decision-making and avoid unnecessary bottleneck into business process by effective data management system & smooth coordination and integration throughout the organization.
8. They are aspiring for Change conventional office into paperless office.

### OBJECTIVES OF THE PRESENT WORK

There are several challenges Bombay Municipal Corporation as a public administration organization

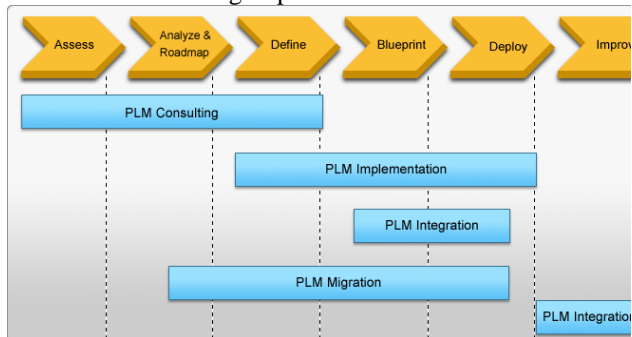
such as fulfilling dynamic and individual needs, utilization of technological development, and collaboration in innovation, continuous process development and not forgetting efficiency requirements of internal processes of the organization and transparency in the process. The practical objective of this research work is to plan a model of PLM acquisition and implementation for public administration to develop effective project management system through which they can manage their entire process effectively, maintain smooth coordination and integration throughout the organization, and different internal department and external agency to enhance project management, process management, working style, effective documentation, security and transparency throughout organization.



**Figure: Virtual Model of PLM implemented Public Administration Organization.**

**IMPLEMENTATION STRATEGY  
PROPOSED METHODOLOGY**

All elements from process needs, technical needs, equipment needs and even corporate culture and change management are key elements to successful implementation of PLM environment. Each must be considered as an integral part of all others elements.



**Figure: Project implementation Strategy Block Diagram  
BUSINESS PROCESS REQUIREMENT**

1. Design well and systematic organization structure with systematic departmentalization of administrative departments of organization, include
  - Create volume for storing various data related activity performed by different group, subgroup, roles, user and different business process.
  - Create virtual organization structure in side system, Create proper group, subgroup, roles and assign the user to each role according to organization and departmental hierarchy structure.
  - Create system administrator role and provide it privileges to manage all administrative activity and same time provide restriction on it to
  - Create project administrator group, role, provide suitable privileges to it for create, modify, assign role, user for project.
  - Assign proper storage space and license level to each user according to their groups and subgroups.
2. Develop effective project management system which simplify and breakdown project into number of steps effectively allocate different available resources and keep track of them.
3. Effectively business process management system which will organize process and responsible to maintain accountability within resources.
4. Provide proper security system to verify authorization and authentication for delegation data for internal as well as external people in organization according to their groups, subgroup, roles, and user as well as to business object level too in special case. Set the proper access and privilege is to different user according to their roles.
5. Design proper time management system for each project and process within organization.
6. Design effective change management system for adopting new innovation which will enhance business process, decision-making as well as continuous improvement throughout system.
7. Develop workflow process for carry on different required business process for approvals of project or process, flow of data in between different departments for various

purposes and fulfilling various business requirements.

8. Create custom business object, like item, folder, and datasets for different departments of organization for storing various business data.
9. Integration of Internal module system like Project, Schedule Manager, and Workflow & also easily Microsoft word /Excel etc. with Teamcenter to enhance efficacy of working process.

Different phases of PLM Implementation:-

1. Discover
2. Design
3. Develop
4. Deploy
5. Drive and extend

#### **Phase 1: Discover :-**

This first phase is where all of the groundwork is being laid to ensure success during subsequent phases and beyond. The outcomes of the discover phase will be leveraged throughout the process to ensure the program and its deliverables stay on track .A cross-functional team is important to success. It ensures that various stakeholders provide input and feedback to needs requirements and facilitates program buy-in. It also works to avoid the risk of tripping over 'blind spots.[3] These roadblocks or hindrances may be significant such as computer hardware needs or lacking interoperability of systems, or simply groups of people who may struggle with an "us versus them" mentality. Leverage the cross-functional team to ensure transparency of business processes, efficiencies, best practices and areas for improvement. Efficiencies, best practices and areas for improvement. Identify all functional areas of the company which will either actively use or be affected by a new system and what their business requirements are. These areas include:

- Planners
- Designers & Technical Designers
- Merchandisers
- Information Technology
- Business Management/Administration/Finance/Accounting
- Sourcing & Production
- Vendors/Partners

Once stakeholders are identified, then roles and responsibilities can be defined and assigned.

#### **Phase 2: Design (Process Mapping)**

The design phase is akin to developing blueprints or patterns and tech packs for a garment. It is the process of taking the stakeholder input from the discover phase and developing a comprehensive, specific project plan to map out how to meet the needs that were defined. In short, it is a project plan. Once the business and its teams have defined goals, expectations, budget, timelines and the requirements, the next step is to design the solution. In the Design phase, a comprehensive and specific project plan is developed which maps out how to achieve the required results. Having all of the needs well defined upfront facilitates clear communication of the requirements of a system's design and functionality. It also enables a project to be mapped out with specific tasks and timelines. During the design phase, the specific processes and day-to-day actions across functions are mapped out to provide a comprehensive view of the current state. From this point, it is important to identify specific examples of waste or gaps in the process, which must be eliminated.[4]

These include:

- Wasted effort
- Mistakes
- Waiting time: Where are the bottlenecks?
- Redundancy and duplication of efforts: Two different groups entering the same data, or the same group required to enter data in more than one location.
- Inefficiencies in cycle time
- Global capabilities/Scalability:

Does the system need to accommodate anticipated future global expansion? Does the system need to accommodate different languages or different types of operating systems? The project plan evolves as processes are mapped and improvements identified. Flow charts clearly identify and assign roles and tasks based on workflow. What is the critical path? Where are the process dependencies and where is there flexibility? Are there opportunities to streamline by reallocating process steps to enable parallel paths? At this point, it is helpful to re-examine specific process owners, roles and responsibilities and renegotiate them if needed. It is common for redundancies and inefficiencies to be identified[5]. It is important that the team communicate single points of ownership and accountability. As the process map evolves, key milestones are identified. Clearly defined milestones are keystones to the design of the PLM solution. A well-designed solution will incorporate system architecture and workflow requirements that will enable efficiency throughout the process and across stakeholders – regardless of function or physical location around the world. Exception management

and dashboard visibility are becoming increasingly critical.

When selecting and designing a solution, seek to preserve existing investments wherever possible. Unnecessarily starting from scratch can be expensive, time consuming and difficult to implement. In addition to the hardware, software and process elements of radical change, the human element cannot be underestimated. It's more likely that stakeholders will remain engaged and effectively embrace solutions that build upon systems and processes to which they already are accustomed. At the culmination of the Design phase, the team will be armed with a well-defined roadmap for the rest of the program, including specific project plans and schedules. At this time, system architecture and design – including initial system configuration requirements will be defined.

#### **Phase Three: Develop**

This stage is the bridge between planning and implementation. During this period of the process, the PLM application and its components are developed, built, configured and installed based on the requirements defined in the Design phase. This includes elements such as:

- Configuring the solution to meet the process requirements
- Configuring and populating data tables such as labor and operation codes, contacts, partners, points-of measure and raw materials
- Configuring tracking and reporting capabilities
- Setting up user groups and defining user roles and responsibilities
- Setting up milestones and workflow process and establishing templates to enable tracking
- Integrating to external systems including Microsoft office.

To provide consistency and ensure that the PLM implementation moves smoothly from concept to delivery, it's important that the company and its vendor continue an ongoing partnership and dialogue. The company should expect ongoing communication and collaboration with technical experts as well as process experts and those who are well versed in the company's specific processes, requirements and expectations. It is important to leverage the knowledge of best practices gained from experience with other industry-specific businesses. Anyone in the fashion industry knows that it presents its own set of unique challenges and opportunities. Just like a design must move swiftly and efficiently from

concept through delivery, so too must a PLM solution.

During the system installation, the “out-of-the-box” functionality is configured and the data is populated. Just as it is important to leverage a company's existing best practices to mitigate radical change, it is also useful to leverage the configurable capabilities of a system whenever possible. By configuring capabilities versus customizing them, the company will be more easily able to adapt the solution as processes evolve or the company's needs evolve. Especially in the fashion industry, needs and requirements change as often as the fickle desires of the trend-driven consumers change. Often times, changing configurations is something the company can do itself whereas customization can be both time-consuming and expensive should the vendor be required to reevaluate and make customized changes[5].

#### **Phase Four: Deploy**

The Deployment phase tests and validates the application with a pilot group. During this phase, not only are the system's configuration, integration and functionality validated, but so too is the plan design. This is to ensure that the solution is accomplishing the goals laid out in the discovery section. At this point, end users are trained to ensure that they understand their roles and how to perform them. It is important in this phase to ensure that change management plans are in place. In the event that something needs to be modified, there must be a clearly defined process to quickly develop, approve and implement it.

Just as the solution itself may best be separated into a modular approach, so too becomes the implementation of the solution no matter how many or how few modules/ functionalities are involved. By taking a phased approach and using a pilot group to roll out the solution's functionalities, a company is able to validate and test the new system in a more manageable environment. This reduces the resources required to monitor implementation and keep it on track. It also enables teams to more readily identify and rectify any potential glitches. Measuring success is faster and easier, and affords the pilot team the time to acclimate to a new system and to internalize new processes. Success breeds success and helps to build momentum. Realizing benefit from a well-defined and contained group helps to prove out the system and works to develop early adopters and system evangelists. Participants with functional knowledge and a positive experience will spread their enthusiasm and be eager to help and share that

knowledge as the implementation advances to the next stages.

#### ***Phase Five: Drive and Extend***

At this phase, the focus is twofold to accommodate both short- and long-term goals. First is to complete the deployment to all sites and portals of the system as validated and/or modified. The second component ensures that a continuous improvement mindset is maintained and enables supplementary enhancements and/or integration of additional content or functionality.

### **IMPLEMENTATION EVALUATION AND ANALYSIS**

Once the system is in place, the job is still not complete. It's important to take the time and leverage the company's internal and external solutions teams to perform post-implementation review. At this point, feedback should be solicited from all users and partners to ensure that all understand and are benefiting from the new processes that are in place. What worked? What could have worked better? What went wrong? Ensure the process continues to evolve by establishing a program for ongoing training for system enhancements, software upgrades and new employees. Software support should never be considered "optional" as it is an inexpensive and valuable way to ensure that all users are working with the latest software versions and are made aware of changes. Make sure there is a mechanism for end user feedback and problem reporting. Sometimes a single user can identify a function or communicate a tip with potentially wide-sweeping benefit. Likewise, quickly identify potential improvements to enable proactive feedback to the solutions provider as they seek to continuously improve and enhance the system. Establish a change management process for implementing enhancements and upgrades; sometimes it can be as easy as using a simplified version of the initial implementation process.[3]

#### ***Sustaining the Solution and Preparing for the Next Initiative***

As is the nature of continuous process improvement, it's important not only to sustain the new PLM solution, but also to look for the next opportunity to grow. Part and parcel of a comprehensive rollout is to include feedback and analysis to complete the cycle. This includes reporting on that analysis to identify potential improvements, refinements or enhancements.

### **RESULTS AND DISCUSSION**

Implementation of PLM environment in organizing various affairs of BMC following result have observed in the new administration era

1. The conventional office is converted into paperless office due to centralized database system & data redundancy has significantly reduced due to shift from physical storage of document to central database system.
2. Project management system has become very much effective by use project management facility of Teamcenter environment which has securely & effectively collaborated with wide from of data, human resources, different element within & out of organization as seen in case BMCWDP001.
3. BMCWDP001 work is very well organized because of sophisticated supervision and tracking system provided by schedule manager which always keep the project under control because of clear accountability of all resources towards work is maintained by it.
4. PLM environment has drastically reduced the time required for verification and approval process required in different process as part of project as in case of our project BMCWDP001 (PR-0123456-BMCWDBP-ZONE-A, CR0008-BMCWDBP-ZONE-A , CN0004-BMCWDBP-ZONE-A) because of complete automation of system with help of workflow system which has established complete coordination and smooth cooperation between different section of organization.
5. Whole system work became completely safe and secure by providing proper authentication & authorization to data & people with help of access manager of Teamcenter environment.
6. Organization has given up its old paradigm where innovation was always last thing to happen but due to change manager functionality which has made revolution by changing complex change implementation system to quick and simple as in case of our BMCWDBP we have implement change in very short period of time as per the request of participant in approval system.
7. Organization has enhance its work style by extending PLM environment by integrating with M. S. office application & web browser with help of four tier architecture so that now it is possible to access any document from database or complete any activity of project from any geographical location with help of world wide web.
8. This implementation has enhanced the process of decision-making by avoiding unnecessary bottleneck into business process by effective data management system, smooth coordination between different

internal & external department geographically located in Mumbai suburban area and integration with various applications. As in case of our project BMCWDP approval time for BMCWDBP, PR-0123456-BMCWDBP-ZONE-A, CR0008-BMCWDBP-ZONE-A, and CN0004-BMCWDBP-ZONE-A is 45, 15, 20, 25 days respectively but in case of conventional administration system without PLM environment it could have took more than six months for this complete approval process.

### CONCLUSION

Implementing PLM environment in public administration we have change the face of whole administration by converting conventional office into paperless office and completely solved duplication & losing of document problem with help of centralize database system. Organization became very dynamic because of all participant involve in the different project and process has become accountable to their work because of advanced supervision and tracking system provided by schedule manger. It enhances the process of decision-making by avoiding unnecessary bottleneck into business process by intervention of workflow automation and effective data management system and complete coordination between different sections of organization which are remotely located. This new environment is successfully providing service to people involve in project quickly while assuring fool proof compliance which was one of the biggest challenge faced by the public organization in before intervention of PLM environment. This implementation system has also reduced lot of monetary expenditure on physical document and record system by digitalize the whole document management system. In future also if we can extend this process into another limb of organization by which it will surely reduce friction in process reduce gravity of the system as in case of our project BMCWDP it has smoothen process by collaboration between different functionalities within organization. PLM environment brought people, process, and product together which is core of success of any organization. So in this way PLM system has greatly facilitated creation, distribution, retrieval, approval as well as internal and external communication within and out of organization.

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