

## **Large Scale Software Project Execution**

How to manage a large project, which involved most of the time multi-discipline, multi-cultural, multi-location and multi-domain?

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### **1. Introduction:**

Many Managers who have been involved in large project execution knows that large-scale project is big in readily quantifiable terms. Duration is measured in years; teams number in the hundreds, and work effort is tracked in tens of thousands of workdays. Furthermore, large projects significantly alter critical business functions. Accordingly, such projects involve a broad cross-section of the business organization, uncover complex cross-functional issues, and fundamentally affect core business operations.

Most major development projects are so complex that they require rigid process control. The traditional approach of establishing requirements and then translating them into designs, code, and operational procedures in phases is a frustratingly slow, labor-intensive, often manual process. Therefore, most organizations should select and use a structured system. In absence of proper synchronization of all the below structures large projects fails. Project Management office influence significantly to execute the large scale project efficiently by taking care of most the parameters. All these structures should collaborate and efficiently execute the large scale project.

### **2. What is the secret to execute any large project**

Below are a few thoughts to follow so that an organization can control failure.

Some industry professionals claim that the best way to avoid large-scale project failure is to stop doing large-scale projects.

Many big businesses and government agencies have delayed investing in technology, whether because of fear of change or the pursuit of short-term profits. In doing so, some have allowed their information processing infrastructure to approach a state of collapse. As a result, large-scale projects are necessary to help these organizations make up for years of inadequate response to competitive pressures, customer demands, changing business conditions, and growing business volumes. Like it or not, large-scale projects are a necessary evil.

Most large-scale project failure can be attributed to breakdowns in project management fundamentals. Responsibility for the success of any project resides in the people of the organization who must do the right things at the right times. Each large-scale project embraces a set of essential functions that must be actively performed at the executive, project, team, and analyst/doer levels.

Despite the appeal of flat organizations, large projects demand accountability, coordination, and effective division of labor.

### **3. Executive-Level Functions:**

Active executive support and sponsorship motivates employees to get involved in the project by providing a measure of security to everyone in the organization.

Senior managers maintain a hand - off approach, but they are available when problems come up. Sponsorship is required on large, complex projects involving a heavy commitment of resources. Large, complex projects also require a sponsor to integrate the activities of the functional lines, to dispel disruptive conflicts, and to maintain strong customer relations. In addition to contributing to a successful project launch, executive involvement helps to ensure that the business vision is articulated and that the project is managed toward attaining this vision. Without sufficient executive involvement, the risk is that the strategic business mission will be supplanted by tactical project objectives. A common loss of focus occurs when meeting an interim milestone date for finalizing the design becomes more important than designing a system that enables the organization to attain the business vision. In this scenario, the project team often takes shortcuts by performing incomplete analysis or leaving complex business issues unresolved.

- Strategic Business Decision: Making and Policy Setting, Speak for the business; sponsor the project; make final decision.
- Strategic Business Vision: Maintain project's focus on enabling the business vision and strategy guidance. Determining "strategic timing" for market release.
- Rapport Management: Maintain cooperation of business community, communicate project issues and status with business; communicate business input to project. Explaining to the project manager what environmental or political factors might influence the project's execution. Coach and mentor managers.
- Business Procedures: Expertise Ensure realistic focus and workable solutions; interrogate project team for completeness. Unearth the potential risks.

- “Devil’s Advocate”/Creative Challenging: Challenges ideas, solutions and people to achieve excellence. Conduct frequent periodic deep dive session or audit into certain area to assess the situation.
- Strategic Information System Vision: Managers ensure solution supports Information System strategy.
- Detailed Project Surveillance: Focus responsibility and accountability; serve as chief project executive. Focus on vital few priorities. Remove barriers. Project management office audits. Help to build a governance framework. Managing people.
- Quality Assurance: Build quality into solution; detect quality problems; ensure follow-through to remedy quality problems.
- Contract Administration: Maintain adherence to agreed-on scope and terms; make changes to scope and terms explicit. Negotiate the contracts.
- Legal Advisory: Ensure that solutions keep with in established law and regulation; resolve legal issues.
- Financial Control: Ensure prudent project financial planning. Look for incentive plan to motivate employees.
- Administrative Support: Maintain level of Organization Infrastructure development.
- Customer connection: Executive management should facilitate to connect with the customer base and ensure plans and team members are aligned with the expectation. Get the feedback for improvement. Maintain a happy customer and happy team. Bringing customers view in the assessment of solution/product/services. Performing pseudo customer role

In short, executives must assume direct oversight of the project, managing the effort in much the same way that they oversee business operations and maintain profit-and-loss responsibility and accountability. They must ensure that a discipline of administration and control is actively in place to plan, manage, and report on project activities. Executives also must help identify and resolve the most severe resource shortages, business problems, and technical issues.

Ultimately, the responsibility for whether the project succeeds or fails rests with executive management.

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## 4. Project-Level Functions:

Project-level functions constitute the traditional project manager's role. But while these functions are generally handled by one person in small to midsize projects, the complexities of large-scale efforts require significantly more attention than can be provided by a single project manager.

For example, the skills needed by a project manager are much different from those required by the systems architect. A project manager must be adept at planning, controlling, orchestrating, and monitoring activities and resources, as well as at collecting information and building consensus. Technical skill, such as in-depth knowledge of the latest software packages and hardware platforms, matters less than the ability to direct team activities, track results, and anticipate potential roadblocks. Conversely, a systems architect must be able to build creative business and technical solutions. Instead of focusing on the logistics and orchestration of the project, the architect is charged with identifying, designing, and assembling the correct combination of technical components that solve the business problems at hand.

In large projects, these tasks are too consuming to combine. Assigning these responsibilities to a single person invites failure – not to mention burnout on the part of the unfortunate individual.

- **Project Management:** Manage daily details; anticipating, planning, oversight and control, data collection and reporting, results tracking and response analysis. Do not operate reactively rather than anticipating possible stumbling blocks. Look for benefit realization.
- **Systems Integration:** Architecture ensure cohesive, integrated, quality solution; coordinate activities of application, data and technology teams; understand the whole picture of the evolving solution.
- **Business Change:** Management Ensure business acceptance of solution; prepare business for entire scope of change.
- **Quality Assurance:** Build quality into solution; detect quality problems; ensure follow through to remedy quality problems.
- **Issue Management:** Track and resolve business and technology issues. Risk Handling and escalation as Risk analyst.
- **Scope Change Control:** Control scope according to business value.
- **User Coordination and Relationship:** Management Involve user experts as appropriate; maintain user cooperation and goodwill.

- Information System Coordination and Relationship: Management Involve technical experts as appropriate; ensure adherence to standards; maintain Information System cooperation and goodwill.
- Technical Configuration: Administration Coordinate details of development environment; coordinate building of production environment.
- Sprit Officer: Maintain project team focus on goals in context of broader perspective; provide communications channel to project management and project executives on morale issues.
- Administrative Support: Infrastructure Maintain level of organization; support greater project efficiency; improve communications; administer project reports; control system, library, support staff, logistics, gofers.
- Manage KPI's: Project KPI has to monitor and measure and show improvements. Demonstrate process improvement through measurement.

## **5. Team-Level Functions:**

Large-scale projects require a set of focused and coordinated teams.

- Business Process Redesign: Architecture Design Improvements/efficiencies into business tax workflow using new technology.
- Applications Architecture Design application solution; resolve interfacing issues. Demo to stakeholders at frequent intervals and implement feedback.
- Data Architecture Design and data solution.
- Technical Infrastructure Design production, development and communications architecture.
- Facilities Architecture: Design physical workspace and conditions in new business environment.
- Knowledge Transfer: Coordination Ensure orderly transition of specialized knowledge/skills from project team to maintenance personnel; manage team training.
- Change Management: Coordination Develop program to introduce business and system change; cultivate two way communications with business and project teams.

- **Business Operations:** Expertise ensures team's analysis and solutions address core business needs.
- **Quality Assurance:** Build quality into solution; detect quality problems; ensure follow-through to remedy quality problems.
- **Team Leadership:** Provide leadership for specific areas, such as programming and integration testing.
- **Value Generation:** Figure out effective value generation from deliverables. Organizational value, team value and stakeholder's value.
- **Cultural support:** Culture play significant role which need t carefully manage and handle with care by identifying if there are any bottleneck. Project culture, department culture, team culture all the factors need to monitor.

## **6. Project Management Office:**

PMO play critical role in large project execution. Project management office can provide supports in all the below areas to successfully help the large scale project execution by facilitating, providing best practices to all the stakeholders.



Fig A: Project Management office activities

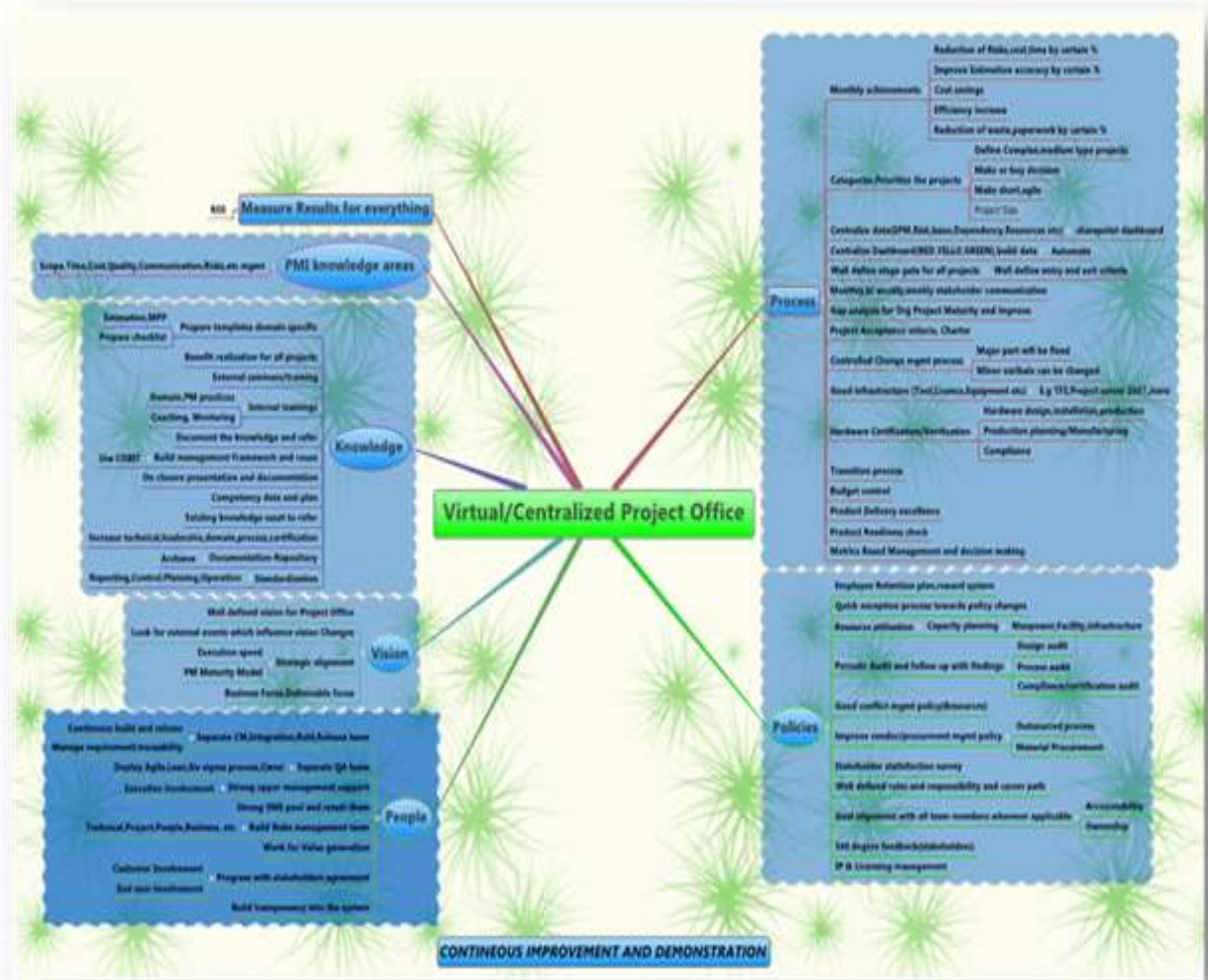
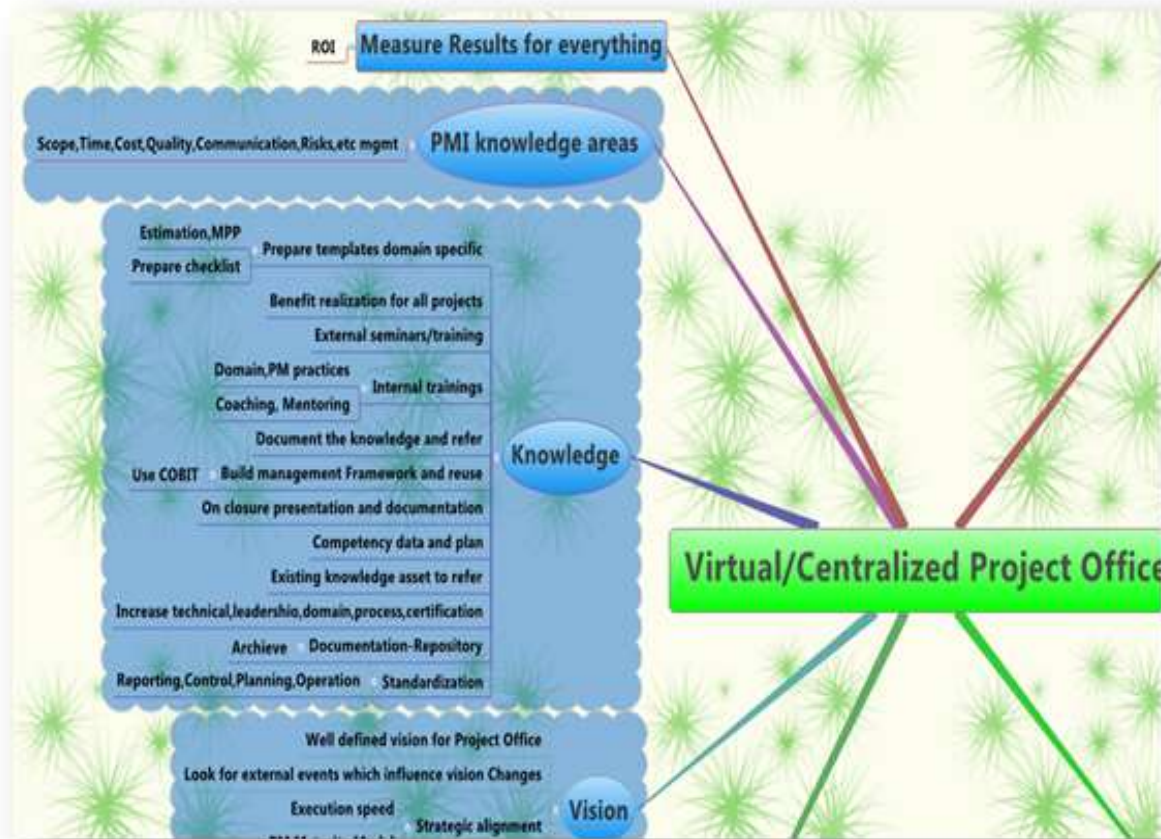


Fig A: Demonstrates PMO office activities. There are many components which PMO can take care like Knowledge area, Vision area, People area, process area, policy area. All these factors PMO can stabilize and mature by doing continuous improvement and help large scale project execution by providing right inputs.



**Fig B: PMO work for Knowledge areas and measuring result**

**Fig B:** Demonstrates how PMO can influence in Knowledge area. PMO can build organizational project management asset by maintaining all the knowledge factors mention in the mind map.



Fig C: PMO vs People area and Vision area

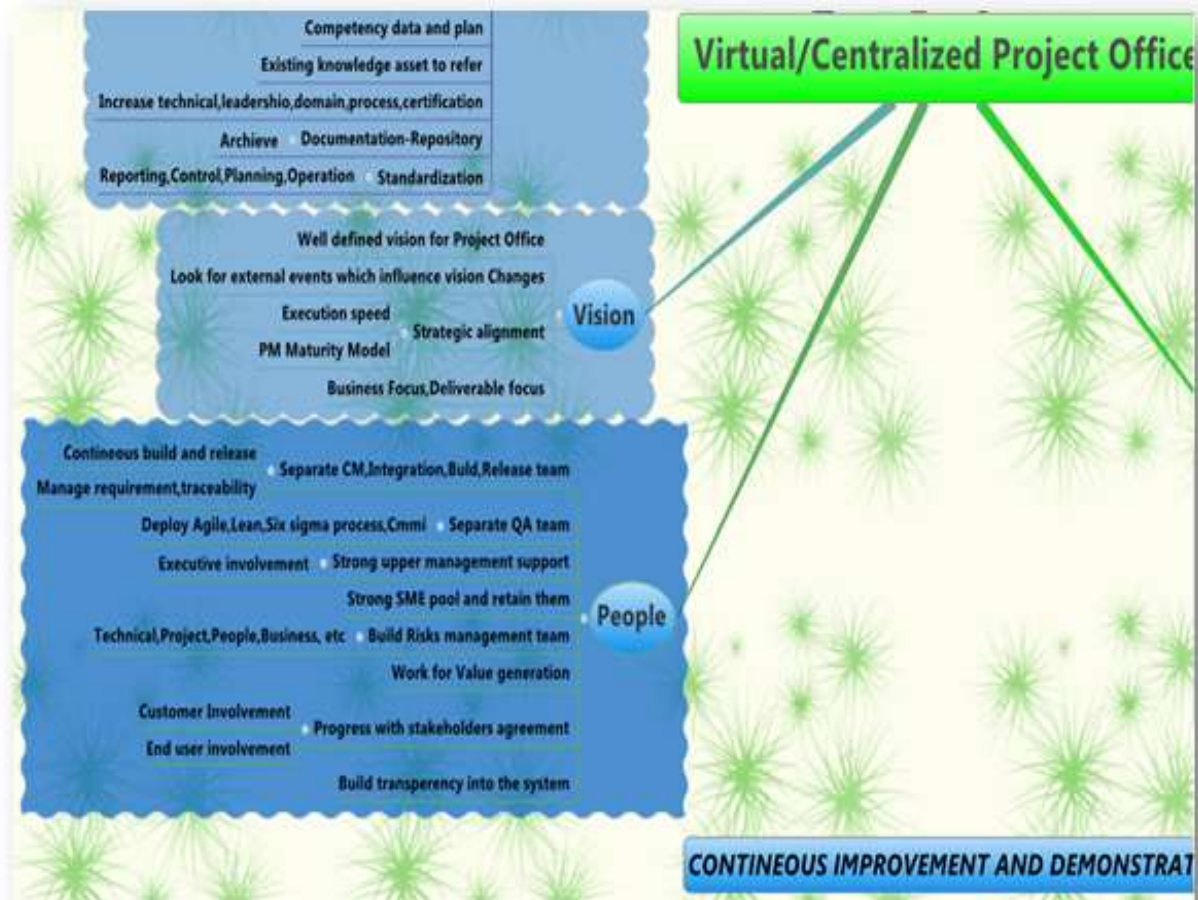


Fig C: Demonstrates various people factors can be influenced by the PMO and how PMO Vision also can affect project execution process.

Fig D: PMO and different policy implementation

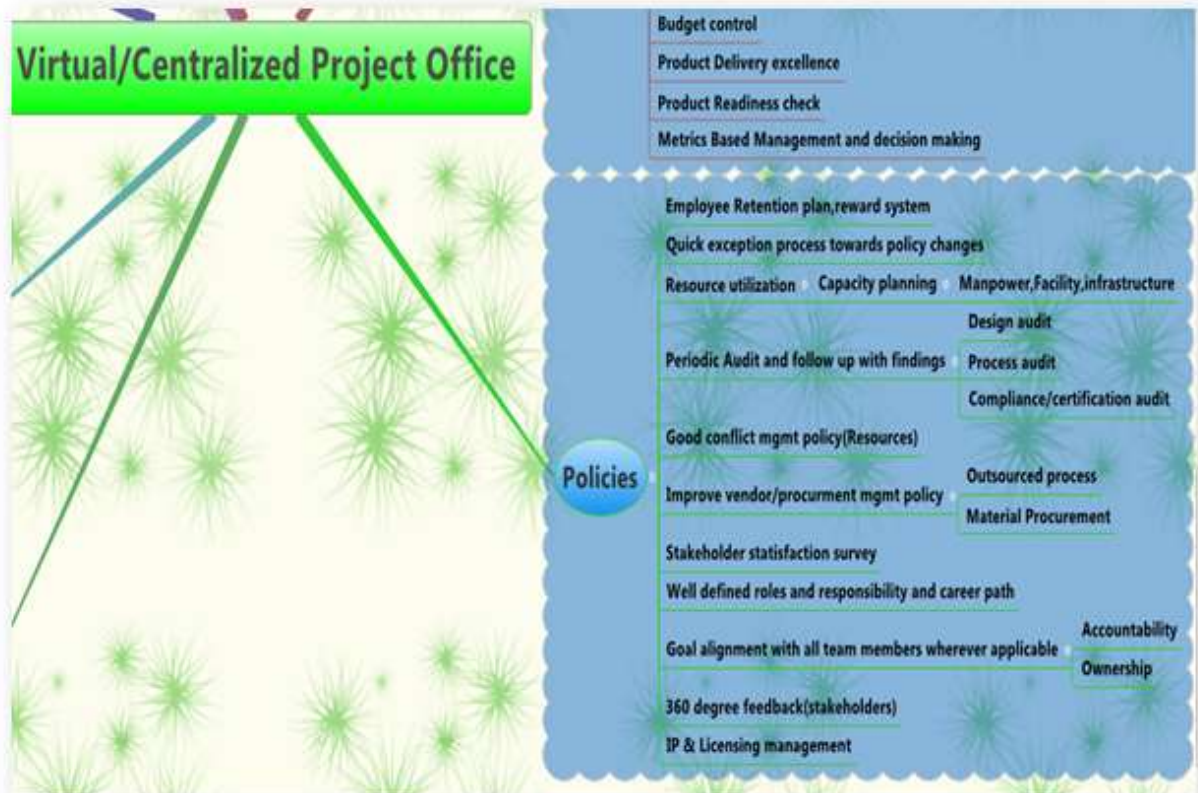
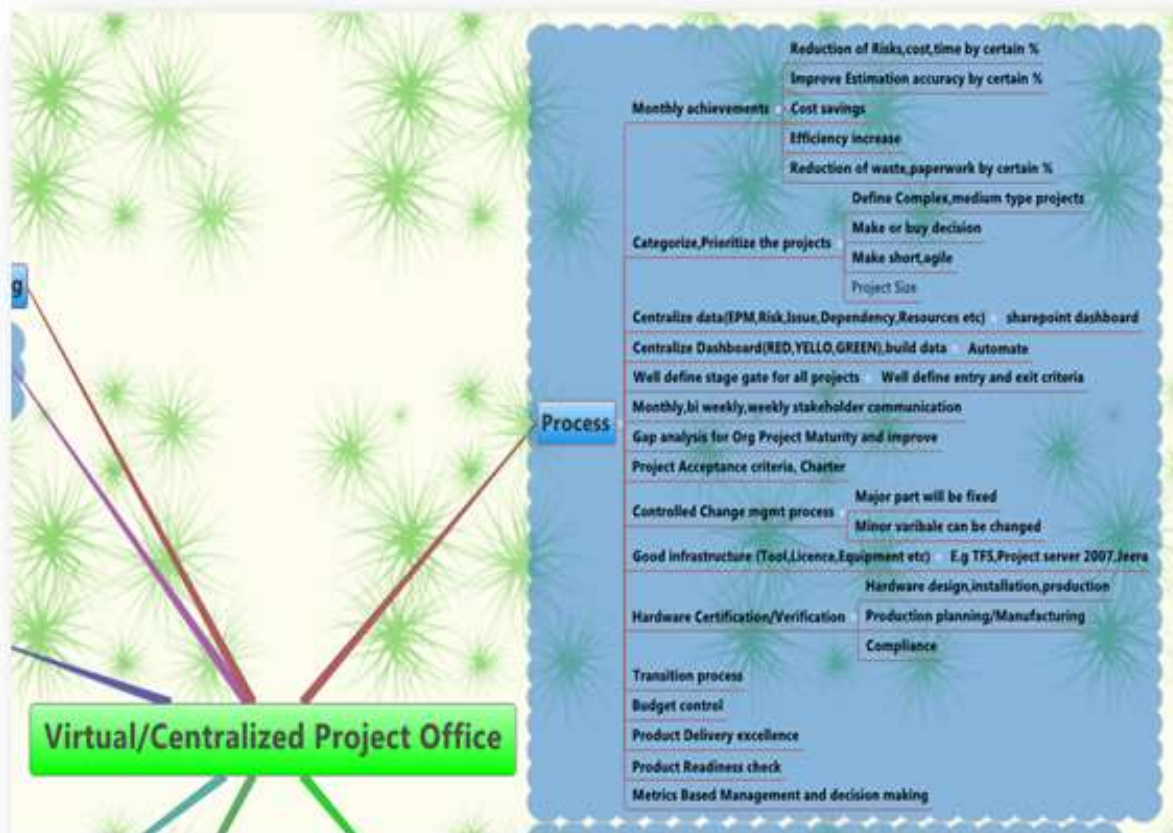


Fig D: Various PMO policies deployed in the organization which helps to execute large scale project execution smoothly and efficiently.

**Fig E: PMO Process affects project execution**



**Fig E:** Demonstrates contribution of PMO on process area to help large scale project execution.

Contribution from PMO on process is essential to successfully execute large size projects. Various identified process areas of effectively manage, probability of project success increase.

PMO built trust through transparency, accountability and a framework for real - time project assessment. The program management office provides the structure and discipline to complete the work that needs to get done. PMO should demonstrate value through the application of the principles of integration, simplicity, results orientation, flexibility; discipline and continuous maturity improvement. PMO can build a best delivery framework for the organization and work on the maturity improvement for year on year. Build a pool of mature project manager to handle complex large size project.





## 7. Conclusion

Successful large-scale project management is not black magic. Organizational leaders can, however, get better at executing what they already know, at applying their expertise and skills, and at reworking their organizational cultures to more readily accommodate change. Project management knowledge learned from executing such large project has to model so that same can be applying for next program. Management decision should be based on the facts provided by PMO. In short, organization must never forget that mastering and applying the fundamentals are the key to successful large-scale project management. With the help of PMO and following above structural approach organization can take up large project and build project management maturity for upcoming days.



## About the Author



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Mr. Chandan Lal Patary is currently working as an agile coach and program manager at ABB. He has deep experience in developing Software applications across various domains and has successfully executed many Projects. Chandan has worked on domain like Healthcare, Aerospace, Building automation, Power automation, Industrial Automaton under real time mission critical product development to large scale application development. Chandan has 15 years of industry experience. He is certified PMP from 2008, Green Belt certified holder from 2005. Chandan is an agile practitioner and Certified Scrum Master from 2011. Chandan holds a Bachelor's from National Institute of Technology (NIT-Agartala-India) in Electrical Engineering. He has completed one year Executive General Management program from IIM-Bangalore in 2007. He has published several management papers. He can be reachable through email/LinkedIn: [patarychandan@gmail.com](mailto:patarychandan@gmail.com)