EXECUTING PROJECTS IN A COMPLEX AND DYNAMIC ENVIRONMENT WITH CHANGING BUSINESS NEEDS

PROJECT TEAM

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INTRODUCTION

The nature of projects has undergone vast change in recent years, necessitating a new approach in managing projects. Project managers have to now deliver in an environment where the number of unknowns has grown and predictability is on a downward spiral. Besides new technologies, several internal and external factors come into play while managing today's multi-location, multi-vendor projects.

Technology integration is becoming an important criterion for delivering superior results and at a much faster pace. With a large number of projects being operated across countries, factors such as geo-politics, compliance and regulation, and work culture have become critical for project success. Clients now expect project managers to have a strong understanding of the business context and provide a solution that is in line with their business goals.

Executing projects in this complex and dynamic environment requires project managers to experiment with new approaches and frameworks. Organizations need to be prepared to learn new ways of executing projects, relook at their existing processes, and show flexibility in the way they respond to the changed business environment.

PMI India's Excellence Enablers Forum (EEF) took up "Executing projects in a complex and dynamic environment with changing business needs" for a research theme. After a series of brainstorming sessions, the team came up with nine problem statements that were presented to randomly selected IT project managers for validation and rating through a survey. The inputs received by project managers were further validated by statistical analysis, which reaffirmed the EEF initial findings. The team originally grouped the challenges into four logical categories – organization culture, lack of motivation, skills and competencies, and processes/practices being followed (or the lack of it).
Refer to the appendix for the project objective, approach, survey graph, and a diagram on how a complex environment develops.

The white paper presents key findings reaffirmed by the survey – the shortcomings and the associated root cause and recommends new approaches, frameworks, and tools that will make project management more effective in today's environment.

STUDY FINDINGS AND RECOMMENDATIONS

PROBLEM CATEGORY NO. 1 - ORGANIZATION CULTURE

Organizations often lack leadership commitment to create a culture that enables project excellence, and that reflects in many ways. Project teams do not enjoy a collaborative and supportive environment that accommodates dynamic changes. The teams are either not ready to adapt to change or the organization has not prepared them for it due to a lack of effective change management.

Conditions impacting organization culture

Communication: team members of geographically distributed projects speak different languages and come from different cultures with their own verbal and non-verbal nuances. A strong cultural understanding among colleagues from different countries becomes critical.

Governance: Many organizations have well-documented management systems but they are not always followed. The lack of management commitment or lack of governance creates a culture of noncompliance.

Leadership: Leadership actions communicate beliefs, values, and assumptions. A leader's actions far outweigh policies, manuals, and processes. In some circumstances, the working style of a leader could create negativity and stifle growth.

Workplace protocols: Workplace habits and behaviors differ across regions, for example, punctuality may be sacrosanct in some cultures and not in others. An organization needs guidelines to define its own workplace protocols that cut across geographies.

Competence and skills: Managers need to inculcate a culture that places importance on skill development. Only those project managers who have the training and competence can comprehend the requirements and are capable of delivering. Performance measures also play a big role in determining an organization's culture. After all, what gets measured – profits, costs savings, and behaviors – contributes to defining project success in the long run.

Organization structure: Different cultures view hierarchy differently, dictating an employee's behavior towards junior and senior colleagues at work. Often these attitudes can be a reflection of organization values.
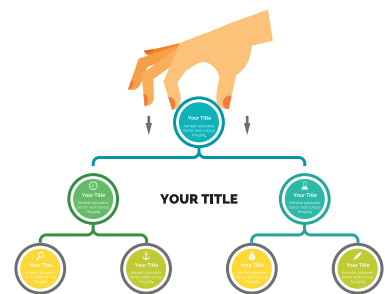
Change management: How the senior and the middle management responds to change determines an organization's culture. Sometimes seen as resistant to change, they can perpetuate a culture that paralyzes the organization.

Root cause analysis of organization culture

The study found that too many structural layers slow down and reduce the effectiveness of communication in an organization. The tendency to focus more on failure than success also has an effect on culture.

When it comes to decision-making, some organizations are slow to respond to change. Problems take too long to solve and keep recurring, which is a waste of time and resources.

Moreover, the effectiveness of frontline staff is reduced when authority is maintained centrally. Restricting decision-making and thinking processes to a handful limits the potential to change and adapt quickly.

Moreover, if employees are not involved or taken into confidence, it results in a poor understanding of the organization's purpose.

In some organizations, key functions operate with conflicting objectives (Eg: cost cutting or potential saving is often misinterpreted). Also the structures and systems create problems by dividing and politicizing resources.

# Recommendations

Some key scenarios with recommendations

- A team tasked with designing the website were feeling a great deal of stress. On further analysis, the project manager realized the reason behind the stress. In addition to designing, the team was increasingly facing the need to build the website as well an additional skill. Only a few of them had the necessary skills; however others were spending time that was meant for their task on hand, trying to learn to build other skills. This was impacting work and neither of it was getting its due attention. Such pressures created by organizational cultures need to prioritize investment of time and energy of resources while handling time sensitive projects.

- A project manager was managing a team of developers, testers, architects, designers, and business analysts to develop an application for a leading and popular university. One of the major goals of the team was to present the information in a compelling way. To encourage innovation, the project manager was lenient on multiple aspects such as dress codes, breaks, seating arrangements, and noise levels. Some team members liked to wander around. This created a comfortable atmosphere where associates felt welcome to take risks and suggested a variety of new ideas. This approach was not in line with the expectations of the university in which they were housed. The team had to decide if they wanted to maintain the lenient atmosphere or abide by the expectations set by the client. Feeling that the innovation of the project would suffer by changing the dynamics of the team, they chose to move off the campus, leading to an innovative outcome.

- Some senior/middle level project managers are fanatical about their own promotion viz a viz growth. They set about accomplishing all that by disregarding all major tenets of leadership, dictating self-serving work requirements and policies, refusing to delegate authority, and using their associates as tools to accomplish their singular objective. In such a scenario, the culture tanked practically overnight. This may drift the project toward a disastrous situation. These kind of situations are well addressed by human resource departments by imbibing concepts such as servant leadership.
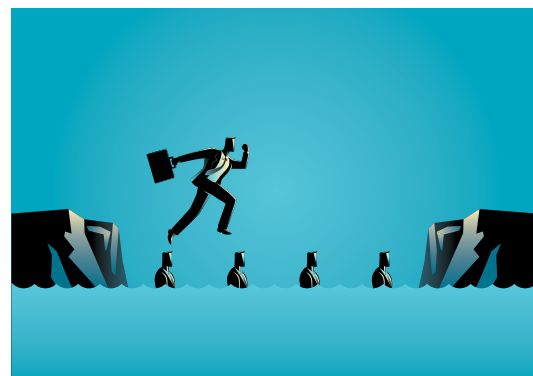
- In the case of a project-based organization, members of the project team only work on project tasks; their relation is skewed toward the project manager as they are aligned to project tasks only, thus leaving no room to have a regular connect with their reporting line managers. The project manager, with the equivalent authority as line managers, is responsible solely for the project and hardly interacts with the line managers, which is expected of them. Such a structure affects the associates who are not fully occupied. With reduced connection with the business functions and line managers, those members could face uncertainty over employment after the project concludes, thus affecting project performance. Quantitative measures should be in place to collect, analyze, and interpret employee performance. Holding superiors at every level accountable for the progress and development of resources reporting into them will curb such issues.
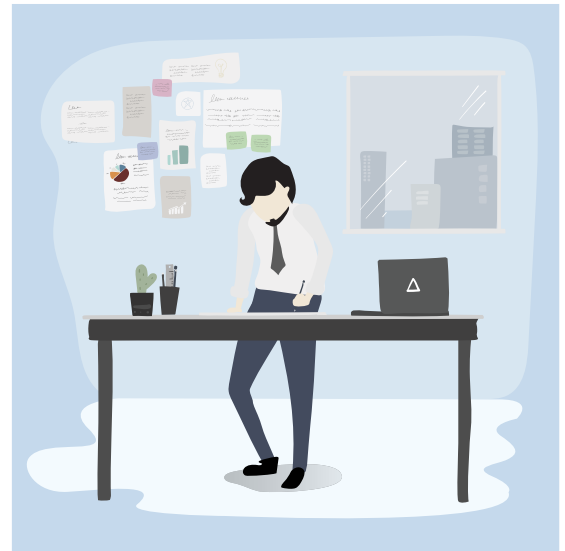
- Resource sharing models are effective in case of niche skills. For instance, if your project team has a resource with a specific expertise you may not easily share that associate with another functional area for project support. Some of these aspects are related to organization culture. These cases are above organization policies and mostly dependent on the project manager's belief in such models. If they are supportive of this model, it works well and if they discourage it, the culture moves toward resource hoarding. Having a people development allocation cell works well in such cases to control any prejudices.

Some key factors and recommendations

- ## Harness the Power of Change

  The mindset of yesterday's employees—accepting compromise, keeping things tidy may have produced some complacency in the system. However, today's resources are expected to raise issues, debate them, and resolve them. They must rally around a vision of what a business can become.

  Jack Welsh from GE used to tell his executives to start their day as if it were their first day on the job. In other words, always come up fresh thoughts. Make it a habit to think about your work. Don't rest on your previous successes.

  Engaging in team building exercises can help team members learn to trust each other, respect each other, and most of all, develop cohesion. The benefits of outdoor team building events speak for themselves. It helps teams know each other outside the office environment, makes them feel important as a part of the unit, and builds trust among fellow team mates. This helps them bring their best skills forward to benefit the group.

- ## Face Reality

  It may sound simple, but getting any organization or team to see the world the way it is and not the way they wish to is not as easy as it sounds.

  We have to infuse every mind in the organization with an attitude and an atmosphere that allows employees to see facts and encourage people to deal with the way it is now, not the way they wish it would be.

  We need to come out of the changing times and land in reality. Things were different before, now we talk about the KANO model. Yesterday's delighters are today's BAU's.

  Check reality: Do you know your customers? This is a good yardstick. Do your customers know you? If not, you have your work cut out.

- **Rewards and Recognition**

  These play an important factor in project performance and employee morale. Strong cultures use these tools to produce extraordinary performance from ordinary people. Creating events to recognize performers and presenting souvenirs that emphasize the company values can have a long lasting impact.

  It helps create an emotional bond among employees. High-performance cultures invest more time and resources to ensure that employees who excel and achieve performance targets are identified and rewarded.

- **Dignity and Autonomy**

The foundation for a successful project implementation depends on how all the resources in the team, viz a viz the organization, feel about the workplace. These include treating employees with dignity and respect, and giving them enough autonomy to excel and contribute.

- **Continuous Evaluation**

  Quantitative measures should be in place to collect, analyze, and interpret employee performance. Also an organization must hold superiors accountable for the progress and development of resources reporting into them.

  Think of reinforcing high-performance behavior, utilizing the rewards and at the same time supporting it with ongoing feedback mechanisms to address weak links. Also define clear performance standards and transparent evaluation mechanism for all employees.

- ## Servant Leadership

  The servant-leader is servant first. It starts with the concept that one has to serve first to bring in the conscious choice to aspire to lead. Let others see you serve, which will encourage them to join you. The servant leadership should demonstrate strong commitment to face challenges, foster followers, and be a powerful influence on the team to translate that into productivity by sharing a certain vision of the future.

  There should be a frequent connect at all levels of employees at periodic intervals. Transformational communiques and short videos to foster strong organizat values should be shared with associates from time to time to build a long-lasting culture.

  Refer to the appendix under Organization Culture for real-life examples

- ## RAID Log

  The RAID (Risk, Assumptions, Issues, and Dependencies) log works as a key tool to see the progress of a project and analyze any impact on the successful implementation of a project.

  Implementing RAID enables team members to look at the project from various viewpoints and an up-to-date RAID log provides a number of these viewpoints at different levels of management. Ensuring that the project team and stakeholders have access to the RAID information will translate into good quality decision-making.

PROBLEM CATEGORY NO. 2 - LACK OF MOTIVATION

The lack of motivation of team members to learn new disciplines required for a project or to reskill themselves for today's requirements impacts project delivery.

Conditions impacting motivation levels

At the organization level, there is a lack of a clear understanding of the need for change or the ecosystem is not conducive for innovation, i.e. the team gets penalized for failure of innovative efforts. In some cases, organizations place little emphasis on R&D and trainings to engage and motivate employees.

Individual level influences could be a general inertia toward change due to a fear of the unknown and resistance to change since it necessitates the need to learn new skills.

Recommendations to improve motivation levels of project teams

Effective communication: The leadership team must communicate to employees on 'why the change', 'what if we do not change,' and 'how the organization is planning to initiate the change' in order to muster employee support.

Encourage innovation: Provide avenues for creative problem-solving such as contests, innovation-focused events, and incentivizing new creative solutions.

Fail fast: Encourage employees to learn and implement quickly, even if there is a possibility of failure.

Reward and recognition: Reward employees for their initiative to learn and use internal forums to recognize them for their efforts and celebrate success. Leverage both traditional classroom settings and mobile, on-demand learning solutions, and address commitment issues through coaching. Establish centers of excellence on areas such as automation and digitalization.

Fulfil basic needs: Maslow's hierarchy of needs theory suggests that motivation is the result of a person's attempt at fulfilling five basic needs i.e. psychological, safety, social, self-esteem, and self-actualization. Organizations need to motivate employees according to these needs.

Source: https://en.wikipedia.org/wiki/Maslow%27s_hierarchy_of_needs

Recommended Framework

Employee engagement surveys: Most organizations conduct their periodic employee engagement surveys to measure employee satisfaction. A careful analysis of the results by the project manager for their respective projects could provide the trigger or input for the Stop Start Continue Change (SSCC) management model.

STOP ▶	* Things we are currently doing in our environment that we should STOP
START ▶	* Things we should START that would bring overall improvement in our environment
CONTINUE ▶	* Things we are currently doing in our environment that should CONTINUE.
CHANGE ▶	* Things we are currently doing in our environment that should CHANGE

Steps to consider to implement the findings:

- Identify the key parameters that would help improve the motivational levels of employees

- Select improvement areas based on the scores, e.g. business units with scores lower than organizational level

- Create a standard operating procedure with clearly defined roles and responsibilities of each stakeholder

- Get HR and business unit leadership teams to sign-off before kicking off the process

- Form a core committee with at least one nomination from each grade. The committee will be responsible for the overall improvement plan

- Conduct the SSCC survey for the focus areas selected, without compromising on employee confidentiality

- Analyze each input and apply the qualitative and quantitative approach to come up with top action items with corresponding target dates

- Seek feedback from employees and pass the results to HR
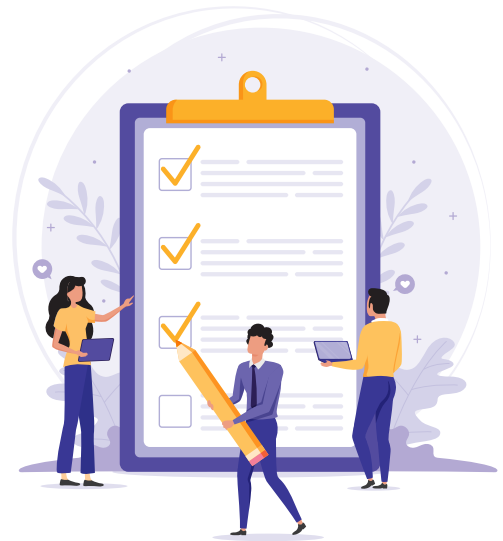
PROBLEM CATEGORY NO. 3 – SKILLS AND COMPETENCIES

There are three main factors behind this problem category – business needs, anticipating demand, and multiple locations.

Business needs: Team members do not understand the business needs of stakeholders in today's fast changing technology landscape, which could result in incomplete or erroneous business requirements gathering. Not many organizations provide training in project management methodologies and techniques, and domain knowledge, which are needed for a better understanding of client needs.

Conditions leading to the challenge

- Poor understanding of requirements due to generational gaps. E.g. baby boomers trying to capture the needs of the latest generation

- Pace of competency development is slower than the need for change in this era of rapid technological development

Root cause analysis of the challenge

The profile of the stakeholder base is changing with the inclusion of the latest generation or gen Z. There is vast difference in the attitudes and behaviors of people belonging to the different generations – from baby boomers to gen X, gen Y, and gen Z. Project managers require specialized competencies to understand the business needs of stakeholders from all the above diverse groups.

Competency development has been slow compared to technology advancement. The workforce needs to reskill itself to meet the new requirements.

Refer to the appendix: Top 10 Strategic Technology Trends for 2018

Recommendations

Understand different needs and aspirations: Engage with stakeholders from different generations to understand their expectations.

Incremental change: Competency development on new technologies cannot happen in a big bang way, but in an incremental manner. Aim for continuous upgrade on technology knowhow for employees at all levels.

The right architecture: Adopt an appropriate architectural design like loosely coupled micro service based design, so that it is easy to plug and play components as you go.

Nurture intrapreneurship: Encourage a culture of experimentation, leading to a possible patent, invention, and creation of intellectual property in areas around technologies.

Anticipating demands: Organizations do not have the ability to anticipate customer requirements and demands in advance.

Conditions leading to the situation

Consultants are unable to understand the nuances of the customer's business domain, with the result that the vendor team does what the customer asks for and cannot offer new ideas on how the customers can stay ahead of competition.

Root cause analysis of the issue

Considering that there is continuous change in the technology landscape, organizations are focusing heavily on technology training. Project management training also gets the required attention due to changes in project methodologies and techniques. However, domain training does not receive the required focus.

Recommendation

Invest in domain training and certification

Multiple locations: Project teams are spread across locations with the delivery of small modules, components, and apps taking place from different parts of the globe and open source components embedded into an integrated product or service.

Conditions leading to the situation

Trained technical experts are required for projects that involve new technologies. However, since building that competency requires time, companies often acquire such talent through lateral hiring or a contractor. Another option is crowdsourcing that gives organizations access to talent on demand at cost effective rates. But such talent may be located in different places. This set of crowdsourced talent works on smaller pieces of an overall system that is then integrated into one system before it is delivered.

Root cause analysis of the issue

- Industry going through stabilization with revenue growth plateauing out. This is leading to a strong drive to bring down the cost of delivery

- The technology pool available across geographies is now accessible through digital platforms

- Open source components are more easily available now which can be integrated into an overall solution

Recommendations

- Strong knowledge and skills to integrate the individual pieces of a solution together

- Identify the right set of crowdsourced developers to engage with, communicate the expected quality standards to them, and integrate them into the system

- Strong and customized technology platform to enable distributed development

- Awareness of intellectual property rights while dealing with open source items. Careful consideration of open source components to balance the risk with the benefits

Refer to appendix under Skills and Competencies for real-life experiences.

PROBLEM CATEGORY NO. 4 – PROCESSES / PRACTICES BEING FOLLOWED (OR THE LACK OF IT)

Project management and software development activities at times are developed as separate but related activities. However, project teams are unable to consider these activities as part of an integrated whole. They are sometimes unable to identify and adopt suitable delivery methods required due to changing technology and market demands. Changing customer demands are leading businesses to come out with frequent product upgrades by way of short and medium sized projects with a short release cycle.
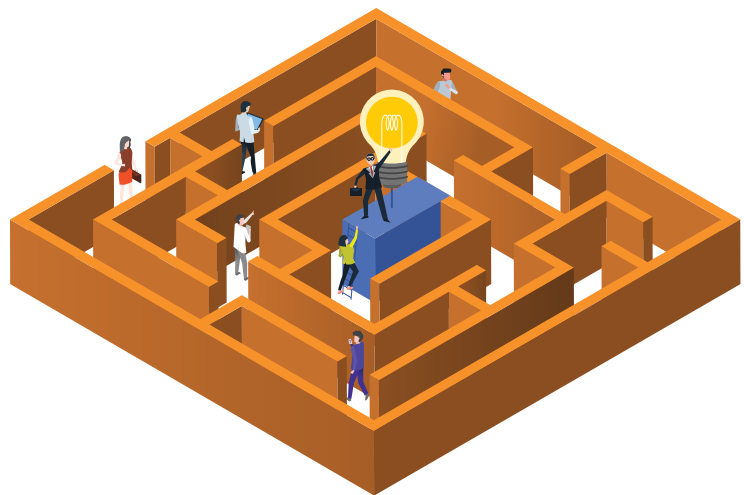
Conditions leading to the situation

This can be broadly classified into the following categories:

- A gap between strategic initiatives and execution, where teams are unable to appreciate the big picture and deliver business value.

- As digital business models disrupt the market and challenge established incumbents, there is a fundamental shift in behaviors and expectations. As a result, traditional delivery methods may not be adequate.

- ISO and CMMi certifications are not sufficient in today's era of business disruption.

- The presence of multiple teams in a large program also creates multiple processes, with each team chasing different goals.

Root cause analysis

- The lack of effective quality centered mechanisms that can tackle cost and schedule overruns

- Lack of a consistent methodology for planning and executing projects, resulting in projects spinning out of control

- As identified by PMI's *Pulse of the Profession® 2017* report, the primary cause of failure is a lack of clearly defined objectives and milestones to measure progress (37%), which suggests a lack of discipline when implementing strategy

Fig 1: Factors for Strategic Initiative failures: Source P*ulse of the Profession*® 2017

Recommendations

Change in mindset: In many organizations, the execution team is different from the team that bids for the project. In some cases, the handover is not exhaustive enough. Organizations need a change in mindset and processes to ensure there is collaboration between these teams during the proposal and handover stage.

Blend of best practices: Many of the 10 Knowledge Areas and 47 Processes from PMI's *A Guide to Project Management Body of Knowledge (PMBOK® Guide)* are applicable to software projects. Consider marrying those with the best practices recommended by A Guide to Software Engineering Body of Knowledge by the Institute of Electrical and Electronics Engineers.

Embrace a fail fast approach: Adopt this philosophy to reduce financial risk in product development. Continually test customer satisfaction to make sure the product or service meets business needs before you invest more time and money in it.

Be business agile: Adopt the business agile approach that focuses on the delivery of business outcome and are not constrained by the choice of the software development method.

Focus on planning: Whether the project follows agile techniques in project management or not, planning is key to success. A high-level integrated plan is necessary to ensure that the end goal is met.

Keep the big picture in mind: Programs and projects do not exist in isolation of external factors. Design additional processes to include the big picture and manage cross project references to ensure any potential impact is identified and addressed on time.

Embrace hybrid approaches: Analyze process gaps and overhaul processes. Pay attention to the integration points between new and legacy applications and design processes and checkpoints to ensure smooth integration between them.

Assess process effectiveness: Assess the effectiveness of processes, not just as a compliance check but also in its true spirit to ensure it can deliver business value. Periodic assessment of processes ensures that they are relevant to the project or program.

Effective governance and stakeholder management: When multiple parties are involved, delivery processes must ensure alignment to goal and vision. Processes that enable effective stakeholder management and communication play a vital role in ensuring this alignment.
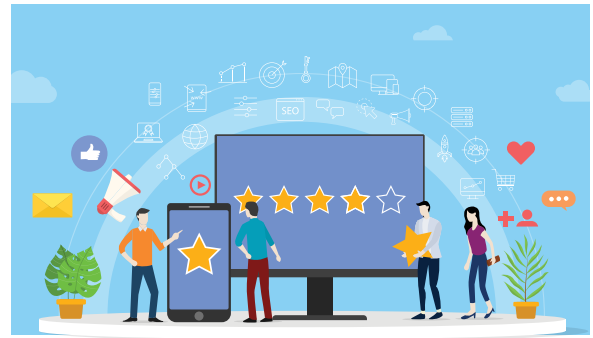
Recommended framework

Iron Triangle and Value Triangle

Choose which development framework works for the project. In the Iron Triangle, the constraints are considered "iron" because they cannot be changed without one constraint impacting the others. While the scope of a project might change in an agile development environment, teams commit to fixed iterations of work. Resources and timelines are fixed, and development teams respond to business and technological changes based on those.
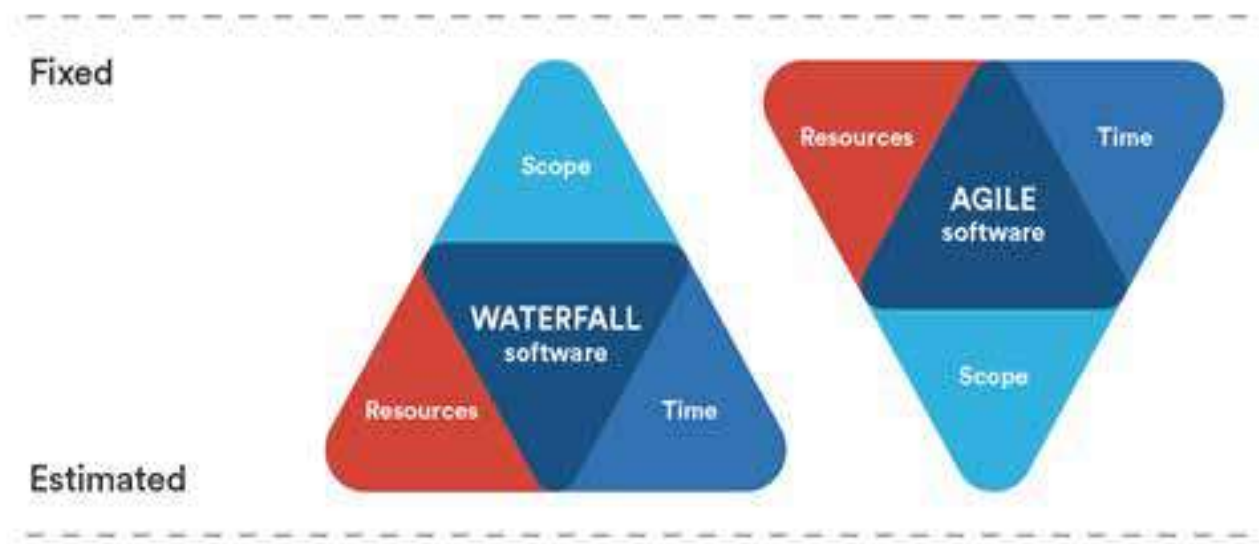

Fig 2: Iron Triangle Vs Value Triangle

Continuous delivery

DevOps is a mindset for better collaboration, communication, integration, and automation among various groups in order to deliver value in continuous cycles. It facilitates continuous cycles of integration, build, testing, provisioning, deployment, monitoring, and feedback.
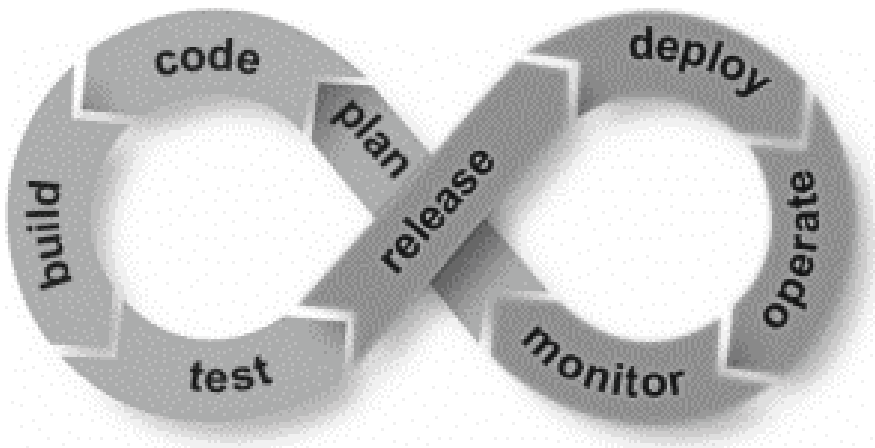
Fig 3: DevOps Cycle

Hybrid approaches: Programs are multi-modal in nature and require a hybrid approach. Gartner recommends bi-modal or the practice of managing two separate but coherent styles of work. In this, one is focused on predictability, and the other on exploration.

Bimodal is the practice of managing two separate but coherent styles of work, one focused on predictability and the other on exploration.

Mode 2 is exploratory, experimenting to solve new problems.

Mode 1 is predictable, improving and renovating in more well-understood areas.
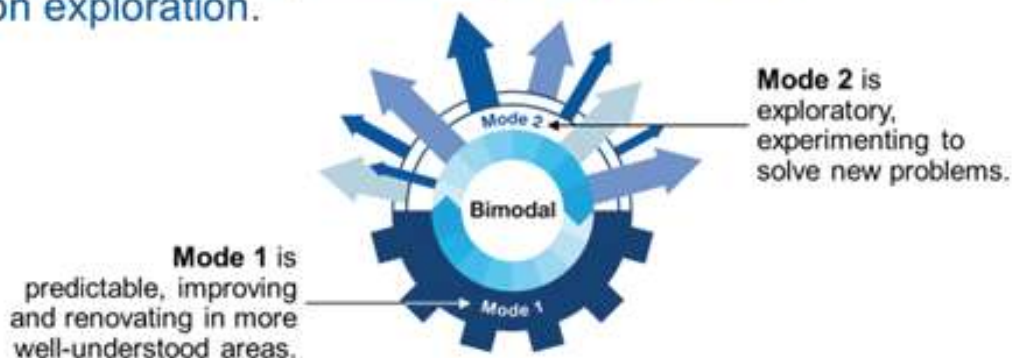
Gartner.

Fig 3: Bi-Modal IT

Agile, Predictive, Hybrid: what is good for your project?

	Pros	Cons
Agile	Supports evolving requirements	Timeframe and costs harder to predict/control
	Delivers minimum marketable product	Requires continuous business involvement
Predictive	Cost and schedule known in advance	Scope defined upfront, so may miss requirements
	Supports formal review and approvals	Cost of change is high
Hybrid	Supports "best of agile and predictive"	May need clarity on how to manage best of both the worlds
		Requires strong leadership support to manage the same

Factors to consider while selecting the best approach

	Agile	Predictive	Hybrid
Organization	Flexible	All or none approach	Multiple partners involved; some could be using waterfall and some agile
	Business support and involvement	Upfront requirements Not done till scope if fully deployed	
Team	Small teams with high degree of collaboration	Coordination and collaboration is limited	A mix of both, if partners work in waterfall mode, minimal coordination, but internal agile teams may still have high collaboration

	Agile	Predictive	Hybrid
Project	High level requirements	Well-defined requirements	Well-defined process models for integration points
	Time and material (T&M), or T&M with a cap	Fixed price or fee	T&M or fixed price / fee
Tools	Availability of tools – build servers, automation testing, backlog management tool	Traditional project management tools	Both traditional and agile tools

Traditional project management approaches and practices are grossly inadequate to execute projects in today's highly complex and dynamic environment. Project managers need to learn how to navigate projects in muddy waters where there is limited visibility of the future and low predictability of project outcome.

Organizations will do well by being flexible and adaptable to change, prepare their employees with relevant skills, provide them a work culture where they are motivated to change, and ensure execution is aligned to the business strategy and objectives.

Refer to the appendix under Processes/Practices being Followed (or lack of it) for real-life experiences
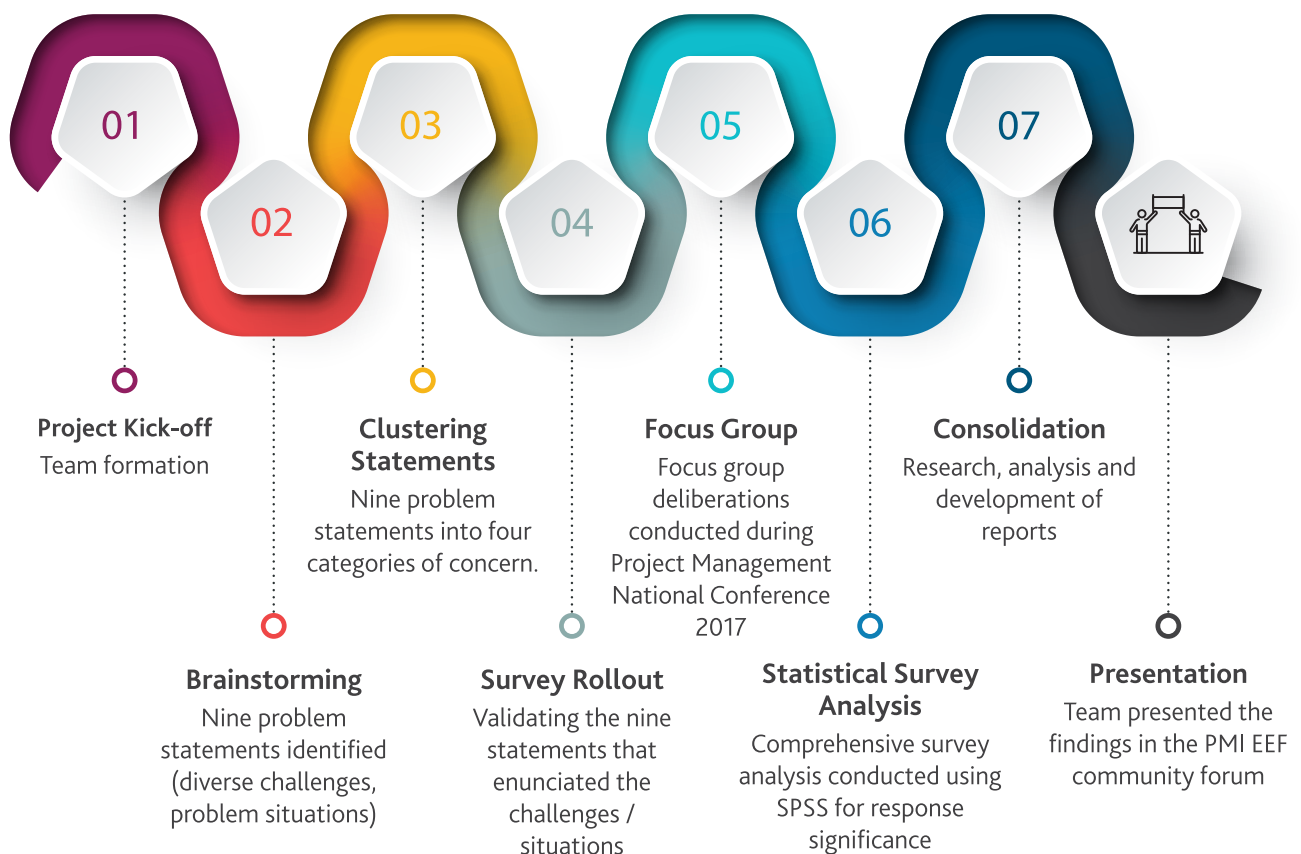
References

1. Integrating Program Management and Systems Engineering, Methods, Tools, and Organizational Systems for Improving Performance by PMI, INCOSE, Wiley Publications, 2017

2. The changing face of business collaboration, Genpact, 2014, a white paper.

3. Software Engineering Competency Model, Ver 1.0, SWECOM, a project of IEEE CS, 2014

4. Software Extension to the *PMBOK® Guide* Fifth Edition, IEEE Computer Society, 2013

5. A *Guide to the Project Management Body of Knowledge (PMBOK® Guide),* Fifth Edition, 2013

6. A balanced approach to bring about the culture change in a competitive environment, IEEE Technology Management Conference, St.John's, New Foundland, Canada, 2005.

7. The human side of managing technological innovation, A collection of readings, Second Edition, Ralph Katz, Oxford University Press, 2004

APPENDIX

Project Objectives

Identify factors/challenges
to execute projects in a complex and dynamic world.

Identify interventions / key enablers that project managers can utilize to address the challenges.

Identify insights and approaches that support realizing the benefits from such objectives.

Approach

01

02

03

04

05

06

07

Project Kick-off
Team formation

Clustering Statements
Nine problem statements into four categories of concern.

Focus Group
Focus group deliberations conducted during Project Management National Conference 2017

Consolidation
Research, analysis and development of reports

Brainstorming
Nine problem statements identified (diverse challenges, problem situations)

Survey Rollout
Validating the nine statements that enunciated the challenges / situations

Statistical Survey Analysis
Comprehensive survey analysis conducted using SPSS for response significance

Presentation
Team presented the findings in the PMI EEF community forum

Post several rounds of discussions, the team came up with multiple problem statements and identified key problem situations and statements. The problem situations and statements were logically clustered, and a survey conducted to rate the key problem statements to validate these statements on factors that contributed to the complex and dynamic environment.

The statements are logically clustered as follows:

- Organization culture
  - Lack of leadership commitment in creating an organization culture that provides executive support which is impacting the project lifecycle
  - Project teams are working in an organization (having enabling functions, verticals, horizontals, etc.) set up that is not conducive for collaborative and supportive functioning to accommodate dynamic changes
  - Lack of timely and top down percolation of effective change management within the organization based on the requirements and lack of culture to quickly accept and adopt the change, which is impacting the output/productivity of the teams

- Lack of motivation
  - Lack of people motivation for a good understanding of the disciplines (requiring teams to co-locate at the client site for integration) and lack of a fast learning attitude to reskill to new technologies, new delivery methods, and new responsibilities.

- Skills and competencies
  - Lack of the required competency to understand stakeholders' business needs, which are rapidly evolving due to the changing technology landscape and often result in incomplete/erroneous business requirements.
  - Consultants are unable to understand the nuances of the domain of customer business, resulting in the vendor team following the curve and not leading the curve. The vendor team does what the customer asks for, and does not provide consulting ideas on what the customers should be doing to stay ahead of their competition.
  - Delivery of small modules/components/apps by people distributed across multiple locations and embedment of open source components into an integrated product/service.

- Processes & practices
  - Project management and software development activities at times are developed into separate, but related activities, thus resulting in project team mindsets that fail to see integrated development and delivery processes/practices.
  - The lack of the ability to identify and adopt suitable delivery methods, besides traditional project management skills that are being challenged due to changing technology and market demand, resulting in short/medium sized projects with a short release cycle (more SI).

Survey results of 186 practitioners: lack of domain knowledge ranked the highest
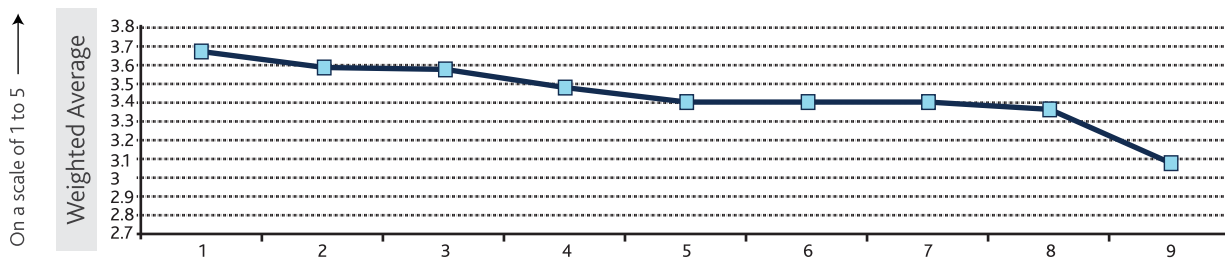

Figure 1

As shown in the above figure, the PMI Project Management Competency Development Framework has revealed that domain knowhow is one of the major skills required for the success of a project

1. Lack of required competency to understand stakeholders' business needs that are rapidly evolving due to the changing technology landscape, which often results in incomplete /erroneous business requirements.

2. Lack of the ability to identify and adopt suitable delivery methods, besides traditional project management skills that are being challenged due to changing technology and market demand, resulting in short/medium sized projects with a short release cycle (more SI).

3. Lack of people motivation for a good understanding of the disciplines (requiring teams to co-locate at the client site for integration) and lack of a fast learning attitude to reskill to new technologies, new delivery methods and new responsibilities.

4. Lack of timely and top down percolation of effective change management within the organization based on the requirements and the lack of culture to quickly accept and adopt the change is impacting the output/productivity of the teams.

5. Lack of leadership commitment in creating an organization culture that provides executive support, which is impacting the project lifecycle.

6. Project management and software development activities at times are developed into separate, but related activities, thus resulting in project team mindsets that fail to see integrated development and delivery processes/practices.

7. Project teams are working in an organization (having enabling functions, verticals, horizontals etc.) set up, which is not conducive for collaborative and supportive functioning to accommodate dynamic changes.

8. The organizational inability in anticipating the customer/market requirements/demands in advance.

9. Delivery of small modules/components/apps by people distributed across multiple locations and embedment of open source components into an integrated product/service.

Results of Survey and Analysis

The Cronbach Alpha Test performed to gauge the survey instrument reliability indicated a high Cronbach's Alpha value.

The principal component analysis - KMO measure of sampling adequacy was very good.

- The Bartlett's Test of Sphericity indicated that the factors were significant to the analysis at 95% confidence.

- Based on the pattern matrix of principal component analysis, the following are the three themes suggested:
  - Theme 1: People - skills and competencies
  - Theme 2: Processes and practices
  - Theme 3: Organization culture

It is noted that the motivation cluster as originally envisaged is part of the skills and competencies cluster.

Though in the initial brainstorming the team had converged at nine problem statements, these statements were then clustered into four groups as the areas of concern. Needless to stay, business does not exist in isolation and there are some external factors that play an important role in the holistic understanding of how the complex and dynamic IT environment develops.

The diagram below explains how the areas of concern are grouped together. Thanks to rapidly changing technologies, customer needs are changing. IT professionals today need to constantly upgrade their skills. There is an impact on delivery processes, which in turn are influencing project management activities. Collaboration is the need of the hour, and that needs the backing of an organization's leaders and a supportive culture. In this context, the motivation of an individual to learn new skills and competencies is paramount, as he or she continuously catches up with the changing business needs. In a nutshell, these factors are resulting in a complex and dynamic project environment. The success of a project depends on how well these factors are addressed.

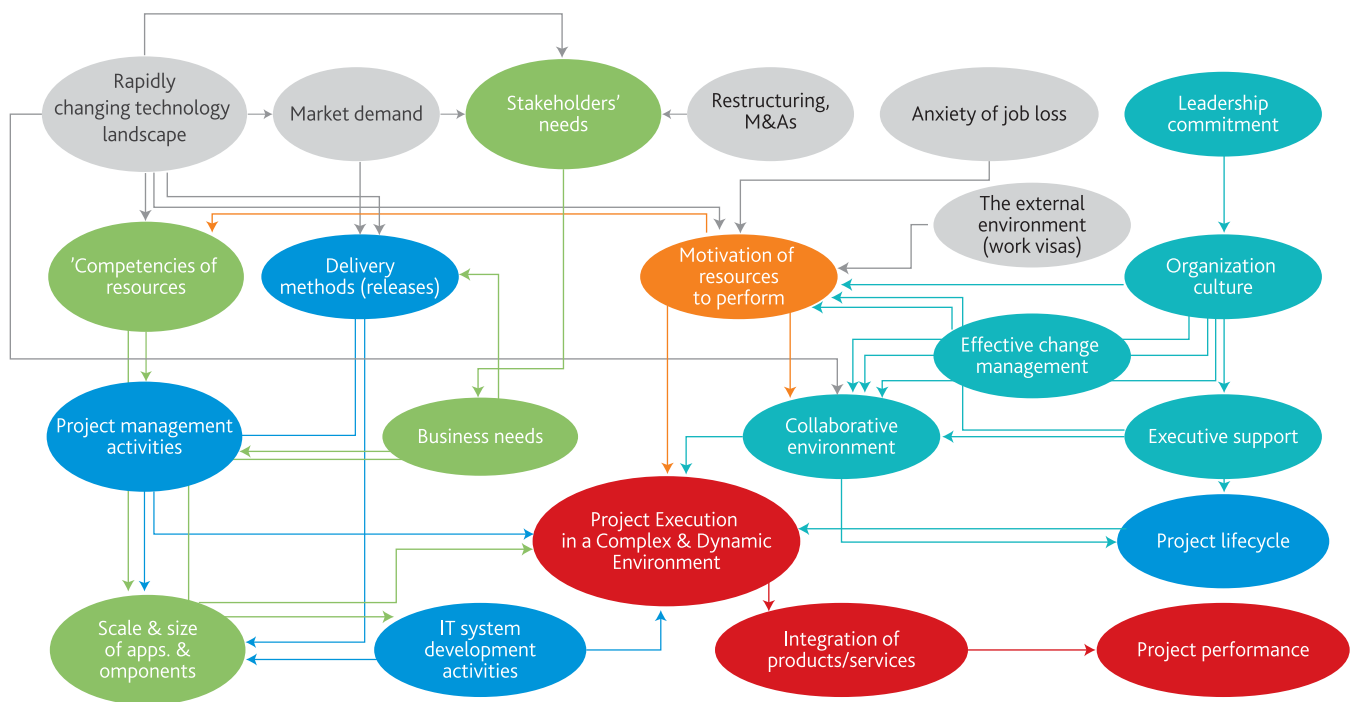# How complex & dynamic IT project environment develops

Figure 2

Companies that took part in the Survey and Focus Group Discussions:

- Tech Mahindra Limited
- Wipro Limited
- Syntel
- KloudData Labs Pvt Ltd
- TCS Limited
- Godrej Infotech Limited
- KPMG
- QBurst Technologies
- Teradata
- Dell EMC
- Nokia
- CIMCON Infotech
- Tavant Technologies
- Tata Projects Limited
- Mphasis Limited
- HCL Technologies Limited
- HCL America Inc.
- Infocareer Pvt. Ltd.

Organization Culture - Real-life Experiences

Microsoft CEO Satya Nadella on shaking up company culture

Satya Nadella shared his vision with Microsoft employees and the section on "our culture" started with "our ambitions are bold and so must be our desire to change and evolve our culture."

Executives from different business units were assigned to the same customer. In the ensuing conversations, they worked out how better to work together.

Uber: A hot start-up in need of a cultural shake-up

Uber's toughest challenge is in curbing its ugliest, most aggressive impulses before its win-at-all-cost culture turns off investors, potential employees, and users.

Processes/Practices being followed (or lack of it) – Real-life Experiences

It was a program for the healthcare industry Digital Thread, to digitally track medical equipment from inception and implementation to retirement. The business problem was inefficient process and mechanism for field service engineers to dispatch a large number of tickets and sync of the status on mobile devices.

Solution approach/key deliverables: The process of field service engineer dispatch mechanism mapped; historical data analyzed and site information analyzed to identify common issues for each site.

Challenges: Issues in understanding the dispatch process in the absence of documentation, delay in access to historical data, and challenges in convincing end users in the changes in the case of background mode optimization.

Benefits: This has led to productivity savings of $15000 per year for the customer.

KM: Process map created and uploaded in a common repository.

Reusability: This map can be re-used for any application that deals with routing.

Automation: Master data load weekly activity automated which led to a savings of 280 hours annually.

Skills and Competencies – Technology Trend
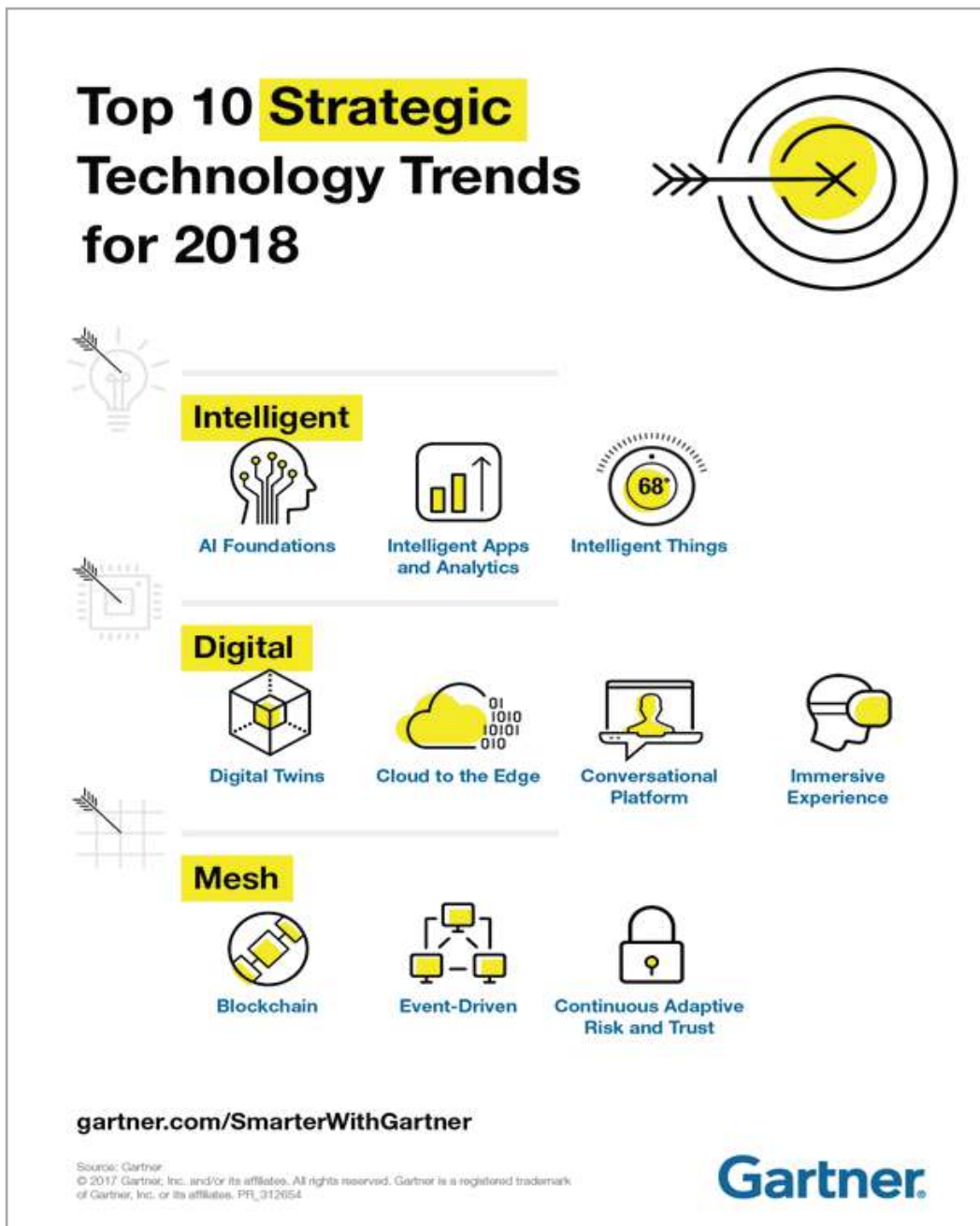
As per Gartner, enterprises are moving to newer technologies and re-defining the way they do business. The workforce catering to the needs of the customer requires reskilling to meet the challenges of these new age technologies. Gartner reports on Top 10 Strategic Technology Trends reaffirms this year on year.

Source: https://www.gartner.com/smarterwithgartner/gartner-top-10-strategic-technology-trends-for-2018/

Skills and Competencies – Real-life Experiences

1. Internal innovation platforms at Wipro

Wipro drives innovation and crowdsourcing internally by enabling employees to build expertise in latest technologies and showcase their ideas through a variety of initiatives.

Horizon is a program designed to identify, incubate, and scale disruptive ideas that could be related to products, platforms, solutions, or competencies that help drive significant growth and differentiation for Wipro in the next 2-3 years. The program since inception has incubated over 80+ ideas in areas such as artificial intelligence, analytics, cybersecurity, digital, industry 4.0, internet of things, software defined, opensource, and cloud and domain platforms. Many of these ideas have scaled and developed into fast growing multimillion dollar practices for Wipro.

Hackathons solve customer problems or address tech/industry whitespaces. It can be for employees of the customer organization, Wipro, and the external community.

Ideathons and patent carnivals – These are great ways to crowdsource ideas and identify innovative solutions.

2. Gamification at Tata Consultancy Service (TCS)

Fresco Play is a platform that enables employees to access training modules on their mobile phones. Digital certificates are issued from the system that enable the resource management system to allocate an individual for an assignment. This re-skilling program has been effective, and has, on an average, resulted in three certifications per employee.

3. Customer journey maps at Emirates

To address the complex challenges that Emirates was facing while growing rapidly, the Emirates customer experience team led an initiative to refocus the company's efforts on building an exemplary customer experience. To achieve this, the team did the following:

- Captured existing customer insights
- Built a holistic view of the customer journey
- Conducted a root-cause analysis of flaws at the moments of truth
- Identified not only relationship breakers but also relationship builders
- Built momentum with willing partners
- Refined journey maps for employee training

4. TCS's Co-Innovation Network (COIN)™

TCS has built a Co-innovation Network (COIN)™ that connects academic research, emerging tech companies, venture capital firms, strategic alliance companies, and Tata Group companies.

TCS also encourage its business units, such as insurance, banking and retail, to have their own innovation units, so that they can handle innovation in specific domains closer to the customer.

5. Project Management Competency Development Framework in Indian context by PMI IREP

PMI's Registered Education Providers (R.E.P.s) for internal purpose, also known as IREP, is currently identifying a framework of competencies (including process, behavioral, domain, technology etc.) and their relative importance for a project manager in IT, IT enabled services, telecom companies in India. The framework will enable the following:

- Supervisor to assess the competency levels of a project manager and ensure continuous development on the improvement areas identified

- Companies in context to select a candidate for a project management position (internal fulfilment)

- Companies in context to recruit a candidate for a project management position (external hiring)

This study has confirmed that domain know-how is essential and equally relevant for ensuring project success.

6. Topcoder platform in Wipro

The Topcoder platform has helped Wipro to implement the crowdsourcing model effectively. With clients in 175+ cities, Wipro's global reach has opened up huge opportunities. Wipro, and specifically the office of the chief technology officer, is now committed to crowdsourcing to drive innovation within their customers, partners, and internally. Through Topcoder, Wipro is focusing on app design and development, app modernization, cloud migration, innovation programs, algorithms and analytics, technical staff augmentation, community advancement, and more.