Trends, Challenges and Practices

for Better Project Management in Construction

Cora Systems White Paper

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Abstract

This white paper examines the trends that the global construction is grappling with, among them regional supply and demand issues. The paper has a particular focus on the UK and Ireland's sector. It examines the key challenges for Construction Project Managers (CPMs), including the building process, costing, estimating, budgeting, capital improvements, equipment, complex scheduling, labor, legal issues and dispute resolution. It concludes with several insights into how CPMs can gear themselves for the future, including best practice for the following processes: Applying Good Project Management Practices; Use a Project Management Office (PMO); Budget Management; Integrated Project Reports and Risk Management.

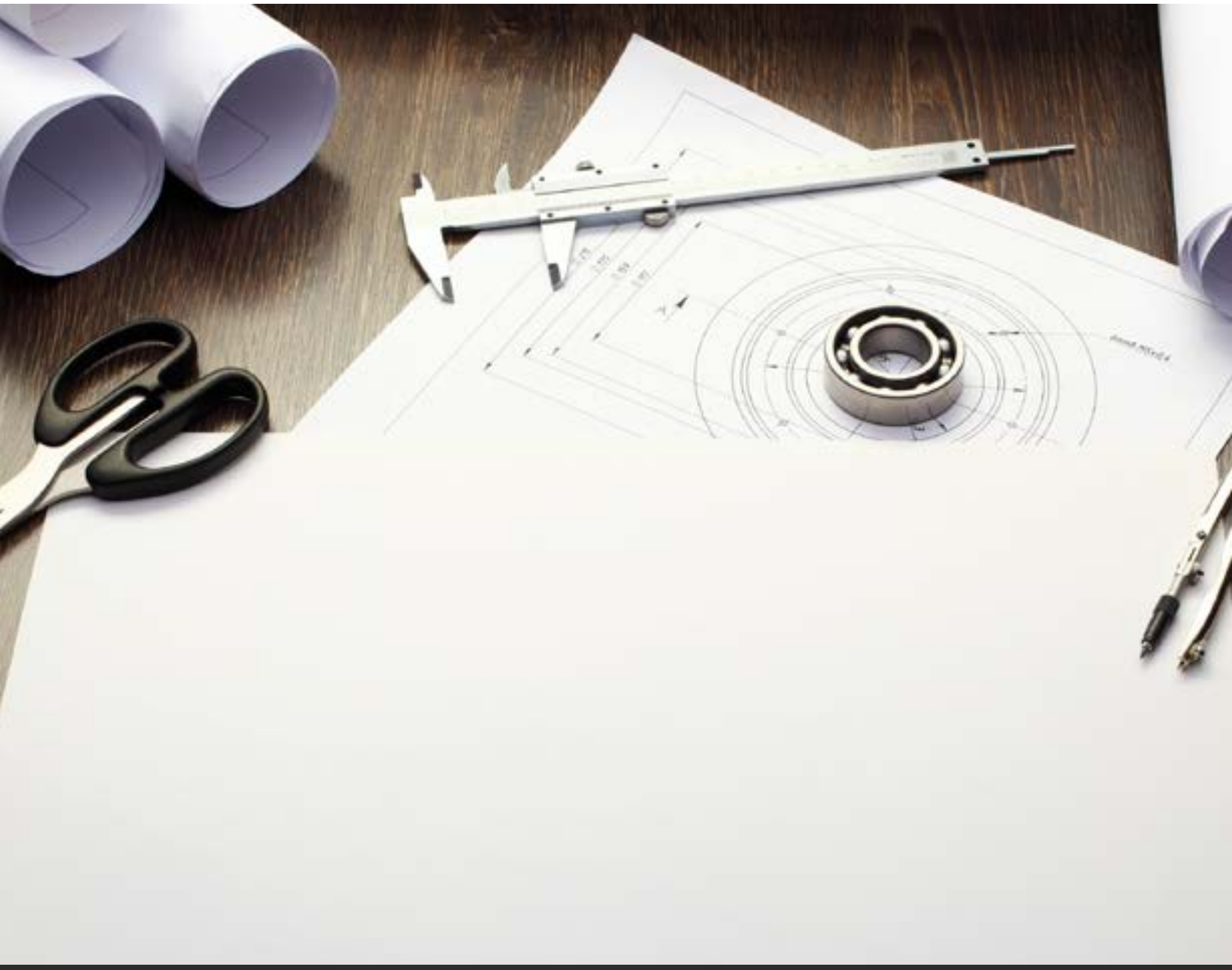
Introduction

Do you think at times your construction project is taking forever? Try and explain that to the pre-wheel project managers of Stonehenge who started work approximately 3,500 BC and finally completed the project in 1500 BC. Or how about the pre-irrational number engineers, pi (π=3.1416), who built the Great Wall of China, the longest structure ever built by humans that also took over 2,000 years to complete.

These monuments were built with no project management software, no Gantt or PERT charts, no long-range planning or scheduling methodologies or inconceivable daily scrum meetings. Can you imagine if the engineers were tracking risks? Mini-ice ages, plagues, new untried tooling techniques, famines, invasions of migrant workers, dramatic cultural, religious and leadership changes. More recently, during the renaissance, St Peter's Basilica was constructed during the reign of 21 popes utilizing 7 chief architects. It was a 120-year project.

In comparison, today's mega-projects are only ephemeral endeavors, but their scale is still mind-blowing. Dubailand which is divided into five leisure and entertainment theme worlds, comprising 26 mega-projects featuring state-of-the-art resorts, shopping, recreation and sports facilities. It spreads over 3 billion square feet or 68,870 acres, bigger than 52,000 football fields, bigger than four and half Manhattans, 100 times the size of Monaco, bigger than Disneyland and Disney World combined.[1] So what have these construction projects all in common? A vision to build something that outlasts the ravages of time. In this paper, we take a brief look at current market trends in the construction industry. We discuss some of the broad challenges the sector faces and describe five project management strategies that companies should embrace over the coming year.

[1] Interesting Facts About Dubai Source: dubaiworld.wordpress.com



Trends in the Construction Industry

While the downturn of 2007-09 did not affect the world evenly, the global construction industry is healthy again and expected to grow considerably over the next decade, especially in the emerging markets of Asia, Latin America, the Middle-East, Africa and Eastern Europe. According to the CIC's (Construction Intelligence Center) the global construction industry is projected to grow from US$7.4 trillion in 2010 to US$10.3 trillion in 2020.[2]

PwC predicts that the volume of construction output will grow by more than 70% to $15 trillion worldwide by 2025, outpacing global GDP. [3] China will remain the largest construction market, the US in second place may experience further growth under the new presidency, while of course the new emerging market India is in third whose insatiable appetite for urbanization, energy, infrastructure renewal and their escalating need for "IT megacities". China, India and the U.S. will account for almost 60% of all global growth. Countries like Brazil are experiencing population growth which is driving largescale energy, urban renewal and transport development projects. Perhaps this growth will slow down post-Olympic Games in Rio.

To predict future growth markets, it's necessary to look at each region's supply and demand statistics. For example, a recent report stated that it may take another decade before supply matches demand in the Irish property market. The UK construction market is growing albeit at a modest rate. The Office for Central Statistics stated that in December 2016, construction output rose by 1.8% compared with November 2016, largely due to an increase in new work. Private commercial work was one of the main drivers behind construction growth, expanding by 5.2% in December 2016. [4] The latest house building data from the Department for Communities & Local Government shows that 153,370 new homes were started in 2016, a 5% increase on the previous year, while more than 140,500 homes were completed during the year. [5]

Due to the deterioration of energy and commodity markets we should expect energy and mining companies to slow down or cancel major projects. World economists believe that the Chinese dragon is having a siesta, which undoubtedly will have a knock-on effect on the entire world market.

[2] Construction Intelligence Center (CIC) Global 50 Report Source: marketreportsstore.com/global-construction-outlook-2020/

[3] PWC Global Construction 2025 Report

[4] UK Office for National Statistics. Source: www.ons.gov.uk/businessindustryandtrade/

[5] The UK Construction Index. Source: www.theconstructionindex.co.uk/

Key Challenges

In the next section, we will look at the anatomy of conventional construction or engineering projects and highlight some of the key challenges that the industry faces. Construction Project Managers (CPMs) are different to typical PM roles, by demanding and incorporating extensive knowledge of the building process; costing, estimating, budgeting, capital improvements, equipment, complex scheduling, labor, legal issues and dispute resolution. It's a unique skill-set. Traditionally, people from the trades like carpenters or plumbers were promoted to CPM roles, but this changed by the end of the 20th century when companies started to look for education over experience. And the reasoning is clear when you look in broad terms at the complexity of roles and responsibilities in construction projects – the client, architect, structural engineer, services engineer, quantity surveyor, clerk of works, local authority, building inspector, builder, sub-contractors and suppliers.[6] To ensure each responsibility is met and every architect, contractor, and supplier remains on schedule and budget, effective construction PMs must utilize software tools and collaborative strategies to provide visibility to all the diverse stakeholders and report on key performance indicators. This is still primarily lacking in the construction and engineering industries.

Supply Chain Management (SCM) is a relatively new term in the construction industry. It involves integrating the operations of all organizations involved with the delivery of a particular product or service, which in the construction settling will include the primary material suppliers, component suppliers, manufacturers, distributors and intermediaries, installers, trade contractors, lead contractors, designers and the client organization. SCM in the construction industry is relatively unsophisticated and years behind automotive companies. A recent report by Berkley University outlined that: "Construction supply chains are still full of waste and problems caused by myopic control.[7] "A 2013 UK Department of Business report explains that: "Practices introduced to reduce cost, including rebidding of sub-contractor packages, transfer of design and commercial risk based on limited information and extended payment terms appear to be reducing the ability and incentive for a project supply chain to work collaboratively to drive out waste.[8] " he broad criticisms are justified and the construction industry needs to address better supply chain management practices.

[6] A Research Report undertaken for the Joint Contracts Tribunal Limited. Source: University of Reading

[7] Roles of Supply Chain Management. Author: Ruben Vrijhoef and Lauri Koskela. Berkley University: www.ce.berkeley.edu/~tommelein/IGLC-7/PDF/Vrijhoef&Koskela.pdf

[8] UK Government Department for Business Innovation and Skills. Title: Supply Chain Analysis into the Construction Industry – A Report for the Construction Industrial Strategy. Source: www.gov.uk

One large criticism of traditional engineering and construction companies is that they are slow to adopt new technologies; indeed, many firms don't even use project management software or still use archaic paper-based processes. In general, project planning remains uncoordinated between the office and the site. Construction projects by their very nature follow the traditional waterfall five phases of project management: initiation, planning, execution, performance and monitoring, and closure. In 2002, the PMI published the Construction Extension for the PMBOK Guide, extension to the PMBOK process for the construction industry. It describes the knowledge and practices that are "generally accepted" for construction over time. Despite many claims to the contrary, the construction industry has great difficulty in organizing work in any way other than the traditional.

There is some significant concern that the construction industry has not yet embraced new technologies and that considerable up-front investment is needed. A recent Navigant report states that R&D spending in construction is less than 1 percent of revenues, versus 3.5 to 4.5 percent for the automotive and aerospace sectors.[9] This is also true for spending on information technology, which accounts for less than 1 percent of revenues for construction, even though a number of new software solutions have been developed for the industry.

[9] Title: Trends in Construction Industry. Source Navigant Report: www.navigant.com

In summary construction companies need to be aware of the following challenges:

1.

Construction Project Managers have a unique skill-set. Look for people that have the education background as well as the on-site experience.

2.

Many construction companies still don't utilize project management software. Project planning remains uncoordinated between the office and the site.

3.

Construction companies need to practice better supply chain management.

4.

Construction companies are slow to adopt new technologies.

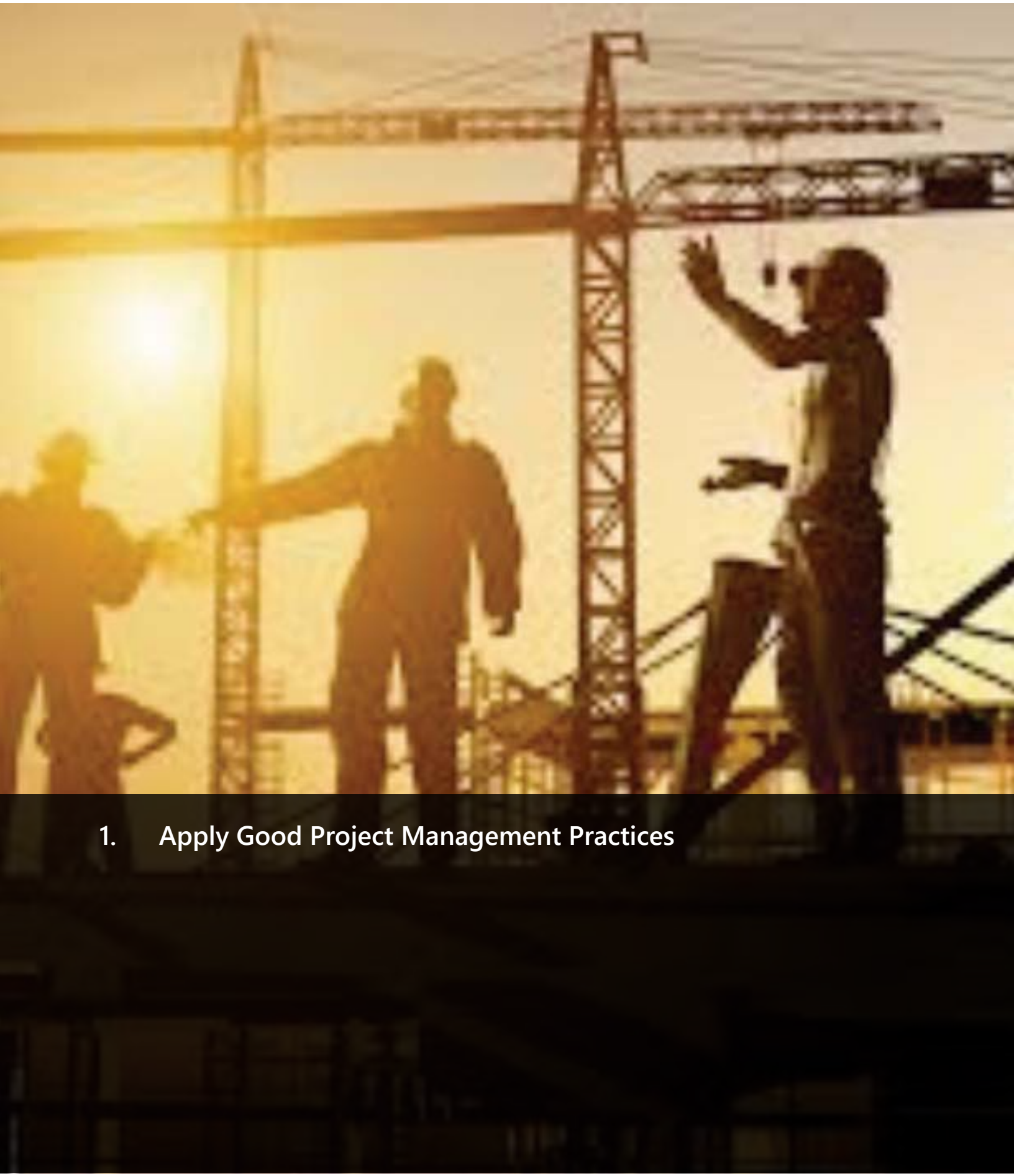
5.

Construction companies still use traditional waterfall process models.

Best Practices for Construction Project Management

In this section, we will look at best practices that we recommend large corporates and engineering firms should embrace over the coming years:

1. Applying Good Project Management Practices
2. Use a Project Management Office (PMO)
3. Budget Management
4. Integrated Project Reports
5. Risk Management



1. Apply Good Project Management Practices

It is of vital importance that a construction project manager take a proactive approach to their project management immediately after their appointment. Getting the basics in place is the critical first step, for example:

- Managing scope to ensure that all the work required is included.
- Project time management to provide an effective project schedule.
- Defining an approach for cost management, human resourcing, communication management and finally integration management to ensure that the various project elements are effectively coordinated.
- Define critical project management check-points.
- Identify how success or even failure will be measured.
- Build team work and create an environment of learning and training.

2. Use a Project Management Office (PMO)

Excellence in project management is essential but empowering the senior managers or executive sponsors using a Project Management Office (PMO) is the backbone of a successful project management approach in any organization. It is a function that provides decision support information, although it shouldn't make any decisions itself. What does that mean in practice? PMO teams fulfill a variety of functions including tracking project spend, tracking benefits, ensuring standards are followed, managing project resources, ensuring training of staff and most importantly gathering data about project progress through decision making reports. It's a forum of people with project-management expertise. It's a mechanism for keeping all elements of a project on track with escalation procedures in place should projects need intervention.

In some companies, the project managers report directly to the PMO, although this is not necessarily the case. Many PMOs might be a central function reporting to the Executive Board, or it might be a department within a division. The PMO might even be a temporary team, put together to support a large construction or engineering program. The proper role of a PMO is to help everybody become a good project manager, to empower others with advice, training, methods, tools and services that make everyone successful at delivering their projects. In short, there is a number of different ways for a PMO to operate, and they all have the objective of providing operational efficiencies and supporting the successful delivery of change.

3. Budget Management

Construction companies are notorious for not managing project budgets which is perilous in the current economic climates where projects are subject to cost-cutting initiatives.

Being able to stand in front of your current projects spend, predicting future or unforeseen budget is now a key component of every construction project. This includes resourcing costs, baselines for cost accrual, cost disbursal and other resource expenditures, in addition to earned value which must be created and careful monitoring of actuals against baselines mandated. All contractual expenses tend to be subject to enhanced scrutiny, both before as well as during the contract administration process.[10]

One of the observable trends over the past number of years is the increase in the number of chartered accounts that are now responsible for large construction projects. Projects are more about the bottom line than ever before. Therefore, think about your project as if it were your money. Would you continue to invest without any visibility on progress? Financial controllers should be responsible for budget reporting at all PMO meetings, corroborating with the project manager's status report. One of the key reasons project failure is due to project over-spend. Make this one of your critical KPIs, using state-of-the-art financial planning and reporting tools.

[10] Project Management in the Construction Industry. Source: Brandeis University. projectmgmt.brandeis.edu/downloads/BRU_MSMPP_WP_Mar2012_Construction_Industry.pdf

4. Integrated Project Reports

Weekly or at the very least monthly status reports, supply chain, change management, and even subcontractor status reports are a must on any construction project. An important element here is consistency and clear communication. The level of granularity and detail in project reports varies greatly depending on who is consuming the report. But we suggest that any project status report should also include information on cost accruals. This can be an arduous undertaking if this type of report has never been created before but it brings the two biggest cause of project failures into the same reporting domain.

Of course, there is a solution to integrated customizable reports – invest in a project management system that harvests data from the different data sources into one reports. As enterprise businesses are wanting to securely integrate their CRM software to their PM systems and vice-versa, the ability to have open Application Programming Interface (API) functionality is now an industry standard as opposed to a "feature." The days of stand-alone spreadsheet reporting are nearly over. Integration between different systems is considered best practice, especially interfacing between budgetary and project management systems.

5. Risk Management

Construction projects are exposed to risks from their very inception. It's the nature of the business. Risk is usually defined as a positive or negative deviation of a variable from its expected value. In general parlance, risk is understood only as a loss. But could the risk be a differentiator? Risk management in the construction project management context is a comprehensive and systematic way of identifying, analyzing and responding to risks to achieve the project objectives. In the Project Management Institute's PMBOK guideline referenced earlier in this paper, risk management is one of the nine knowledge areas described.[11] In the various project stages, first it must be considered what risks are likely to occur with measures or actions and associated costs to mitigate each risk. Cost of risk is a concept many construction companies have never thought about despite the fact it is one of the largest expense items.[12]

The success of construction lenders, owners, contractors or subcontractors may depend on how well each of them addresses project risks. In many construction contracts, the risk management approach is poorly defined, agreed or allocated and does not include incentives for risk sharing. Juxtapose this to the technology industries where the budgets are usually smaller and yet the team risks are continually discussed at the daily scrum meetings.

Therefore nowadays, the risk analysis and management continue to be a major feature of the project management of construction projects in an attempt to deal effectively with uncertainty and unexpected events and to achieve project success. Include risk management in every project status report and make sure that it's one of the first topics that is discussed at every PMO meeting.

[11] PMI Construction Extension to a Guide to the Project Management Body of Knowledge. Source: www.works.gov.bh/English/ourstrategy/Project%20Management/Documents/Other%20PM%20Resources/ConstructionExtension.pdf

[12] Risk in Construction Industry. Source: Nerija Banaitiene and Audrius Banaitis dx.doi.org/10.5772/51460

Conclusion

The road to success is always under construction. This paper predicts that over the next few years the economic climate for the construction and engineering industries is going to grow exponentially, especially in the new emerging markets. The current deterioration of the energy and commodity fields is a concern but the supply and demand statistics indicate that property is certainly a growth area. We suggest that some of the challenges facing construction and engineering can be overcome by embracing the use of Advanced Computer based Management Systems (ACMS) and these will drive project management practices. However, organizational barriers may hinder the potentiality of these systems thus changes to the organization's structure, contracts, risk management, making continuous planning a habit, implementing automated reporting and use of state of the art tools to monitor cost as outlined in this paper should be embraced to achieve full benefits. Step by step, a path; stone by stone, a cathedral.

About Cora Systems

Cora Systems is a worldwide leader in providing enterprise PPM solutions to global organizations and government agencies, such as Honeywell, Allergan, PwC, City of London and the UK's National Health Service. Cora is a proven foundation for the delivery of projects, digital transformation and strategic objectives. Fully digitizing program and project lifecycles, providing total transparency, empowering decision-making, and streamlining governance and reporting. Every day, across more than 50 countries, over $20 billion worth of projects are managed on the Cora platform. Headquartered in Ireland and with regional offices in Dublin, Bedford and Boston, Cora's client base includes Allergan Pharmaceuticals, Boston Scientific, City of London, Honeywell Building Solutions and the UK's National Health Service. For more information, visit: **www.corasystems.com.**

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