



WHITEPAPER



INTEGRATING  
PROCUREMENT WITH  
PROJECT CONTROLS  
**IS CRITICAL FOR  
COST MANAGEMENT**

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## ABSTRACT

Project controls needs real-time, accurate and complete project data to be truly effective. A significant percentage of the costs and activities of most construction projects, however, is commonly held in the purchase orders and subcontracts owned by a separate procurement department. The challenge with this is, when project procurement is not a cohesive part of the project team, it introduces a disconnect and silo-effect that causes information delays, uncertainty and a lack of complete project visibility. This disconnect can be eliminated by integrating procurement directly into the project team and its project controls systems. This not only provides real-time cost visibility, it also delivers key data on accruals, vendor performance, vendor progress, vendor trends and forecasts. It additionally reduces legal risks that can arise due to knowledge gaps within a corporate procurement department that is not deeply familiar with the nuance of construction project procurement and contract management. This paper will explore the importance of tightly connecting project procurement with project controls to reduce risk and gain a complete, holistic picture of the project in real-time. The concepts are drawn from many years working with organizations delivering major projects and the tangible results of rethinking the project-procurement relationship.





## INTRODUCTION

For any major construction project, a considerable portion of the project's budget will be consumed by the many purchase orders and subcontracts that are executed by the procurement team on behalf of the project. The financial commitments, accruals, costs and vendor activity that take place around these purchases is critical information for the project controls team to ensure good cost management of the project. Any delays in access to this data can introduce significant risk to the project. The project controls team will therefore insist that all project-procurement should be integrated into the project team, and further, into the project controls' system. The finance department, by contrast, will typically have a similar sense of ownership of procurement. They will very likely dispute the project controls team's claim and assert that all procurement that occurs within the organization – whether it's project procurement or corporate procurement – should be within the purview of finance and the corporate accounting system (ERP). This impasse introduces a tricky situation as both sides have valid arguments as to which department and system should be the owner – or originator – of project procurement. Fortunately, there is an integrated approach that can deliver the information and control to satisfy both departments and reduce the project risk associated with segregated procurement.

## CORPORATE PROCUREMENT VERSUS PROJECT PROCUREMENT

Depending on the size and type of organization, the responsibility for procurement and subcontracting is most often held within the company's finance department. In many ways, this is a natural fit since procurement is ultimately a financial transaction for the purchase of goods and/or services. To add to that, most finance (ERP) systems have procurement modules that tie directly into the corporate accounts and ledgers and provide accounts payable features for vendor invoice payments. Any procurement professional will tell you however, that procurement has many more layers and intricacies than just a financial transaction. Procurement is a process that can include an array of activities including contract management, tendering, expediting, document management, scheduling, field inventory, diligent negotiations, vendor performance management, shipping & logistics, and, of course, knowing how to get the best deal. There's no question that the procurement process can be very complex; and further, plays an especially critical role in project-driven procurement. Companies that fund major projects (i.e. owners) – or construction contractors whose primary source of revenue is through the execution of projects – will require specialized procurement and subcontracting that differs distinctly from corporate procurement in that the materials, equipment and services purchased on behalf of the project are tightly woven into the planning, budget and controls of the project. Corporate procurement represents the purchases of company assets such as office furniture, buildings, equipment, vehicles, etc.





## 2.1 | MANAGING PROCUREMENT FOR CONSTRUCTION PROJECTS

To understand why project procurement should be handled separately from corporate procurement – and embedded directly into the project team and system – below is a selection of some of the key factors that differentiate project procurement, followed by a brief explanation of each.

To understand why project procurement should be handled separately from corporate procurement – and embedded directly into the project team and system – below is a selection of some of the key factors that differentiate project procurement, followed by a brief explanation of each.

- Managing Project Information Across Multiple Organizations
- Procurement Planning and Scheduling
- Procuring Within the Project Budget and Project Cost Codes
- High-Volume and Rapid-Response Procurement
- Long-lead Procurement and Expediting
- Management of Submittals and Engineering Drawings
- Jobsite Inventory
- Multi-Currency



### 2.1.1 Managing Project Information Across Multiple Organizations

Major construction projects will have multiple organizations working together, starting with the owner at the top, and a cascade of contractors, subcontractors and suppliers working in different areas and specialties throughout the project lifecycle. A successful project requires a collaborative effort of these many partners, sharing tens of thousands of pieces of data, and playing well with each other to eliminate any disconnects, delays and errors. Although many project owners will outsource part of the procurement effort to specialized engineering & procurement (EPCM) organizations, an increasing number of owners are opting to tackle all procurement in-house. Contractors, on the other hand, will typically shoulder a significant amount of purchasing and subcontracting load for their portion of the project. Whether contractor or owner, each entity in the hierarchy of organizations (owner > contractor > subcontractor and so on) will possess key project planning, commitments and actual cost data, that needs to be fed upwards all the way to the owner to ensure all parties have current, accurate and complete information for project controls to make key decisions within each entity. This hierarchical data relationship places a unique obligation on each company to enforce a tight relationship between procurement and project controls.



### 2.1.2 Procurement Planning and Scheduling

The Procurement Plan is an integral part of the overall project schedule and budget. The project procurement team will lay-out a detailed plan that identifies key purchasing milestones to ensure they are in step with associated project scheduling milestones. As articulated in [1], “For project control, suppliers and contractors must be obligated to provide cost, resource, and schedule information as needed to plan the project, measure progress of the work and support change management.” It goes on further to say that, “The goal of procurement planning then is to ensure that labor, materials, tools, and consumables that are obtained from or through suppliers are obtained in a way that optimally achieves project objectives and requirements.”





## 2.1.3 Procuring Within the Project Budget and Project Cost Codes

Project procurement lives within the constraints of the project's budget; and further, the budget of each project cost code. Construction projects have a complex hierarchy of cost codes that go beyond what is typically used in the accounting system. Most ERPs aren't setup with the full cost breakdown structure (CBS) of the project which results in a misalignment of where procured items are committed and costed to the project. The image in Figure 1 below shows a list of purchase orders and service orders in the top grid, with the line items of the selected purchase order in the bottom grid. Notice that each of the line items is associated to a specific cost code, construction workpackage, purchase requisition and, if applicable, RFQ. All these properties are tied directly into the project budget, CBS, and WBS.

Purchase Orders

\* From Date: 2016-Jan-03      \* To Date: 2020-Dec-29

Drag a column header and drop it here to group by that column

<input type="checkbox"/>	Purchase Order	Reason	Contract #	Vendor	PO Date	Type	Reason	PO Title	Status	Approval Stage
<input type="checkbox"/>	181-2960-PPE2	1		Blackout Energy Services Inc.	2019-Jan-02	Purchase Order	Equipment & Materials	Purchase Piping materials	In Reviewing	
<input type="checkbox"/>	PO-CivOrtl	0		Blackout Energy Services Inc.	2019-May-27	Purchase Order	Contracted Services	Directional drilling	Open	
<input type="checkbox"/>	PO-P190202	0		United Piping Inc.	2019-Jan-06	Purchase Order	Equipment & Materials	Steel and piping materials	Approved	
<input checked="" type="checkbox"/>	PO-PPE	1		United Piping Inc.	2019-Jan-06	Purchase Order		Piping materials	Approved	
<input type="checkbox"/>	PO-Pipe-220581	0		Sage Energy Corp.	2018-Mar-01	Purchase Order		Purchase Civil Materials	Open	
<input type="checkbox"/>	PO-Pipe-23872	0		Plovick Manufacturing Services	2018-Mar-01	Purchase Order		Purchase Piping Materials	Approved	
<input type="checkbox"/>	PO-P19-4372	1		Wade Services Inc.	2018-Mar-01	Purchase Order	Equipment & Materials	Injection Pumps and metal	Approved	

Count: 17      1 - 17 of 17 Items

For details on any Purchase Order, click on it in the table above

---

Purchase Order Item Allocations:

Drag a column header and drop it here to group by that column

Item #	Requisition #	Item Description	Cost Code	Workpackage	RFQ #	Tag Number	Resource Code	Construction Workpackage	Class
1	PRQ-Oranage	5'F modimoblex resastarc - hung, spaced in	C1243GN6-303-608	3.3.5 Supply pipe oranage components				101457	Crywall Materials
2	PRQ-Oranage	15cm Pipeline Steel in 2m lengths	C1243GN6-303-608	3.3.5 Supply pipe oranage components		TN205802	R2390	101457	Pipeline & Infrastructure Mat
3	PRQ-Oranage	Box Gilder	C1243GN6-303-608	3.3.5 Supply pipe oranage components				C15-8288	Infrastructure Materials
4	PRQ-Oranage	Channels, Steel	C1243GN6-303-608	3.3.5 Supply pipe oranage components		H2743225X		C15-8288	Structural Steel
5	P2Q-PPE-Materials II	Angle, Steel	C1243GN6-P90-609	1.2.3 Purchase Piping Materials		H2743226296		C15-8288	Structural Steel Materials
6	P2Q-PPE-Materials II	Bar, Steel	C1243GN6-P90-609	1.2.3 Purchase Piping Materials		B2962032		101457	Structural Steel Materials
7	P2Q-PPE-Materials II	15cm Pipeline - Galvanized epoxy coated	C1243GN6-P90-609	1.2.3 Purchase Piping Materials		B2062882		W18-44.14	Pipeline & Infrastructure Mat
8	P2Q-PPE-Materials II	1015-05 12" Tank Steel Pipe	C1243GN6-P90-609	1.2.3 Purchase Piping Materials				C15-8288	Piping Materials
9	P2Q-PPE-Materials II	15cm Pipeline Steel in 2m lengths	C1243GN6-P90-609	1.2.3 Purchase Piping Materials		TN205802	R2390	W18-44.14	Pipeline & Infrastructure Mat
10	P2Q-PPE-Materials II	Channels, Steel	C1243GN6-P90-609	1.2.3 Purchase Piping Materials		H2743225X		101457	Structural Steel
11	P2Q-PPE-Materials II	42" Access Fitting Assembly	C1243GN6-P90-609	1.2.3 Purchase Piping Materials		A32062882		101457	Spooling Fittings

**FIGURE 1** - Purchase Order line items showing cost code, workpackage, tag number, etc.





## 2.1.4 High-Volume and Rapid-Response Procurement

The project procurement team can experience a very intense pace of activity for the duration of the project. It's not uncommon for major and mega projects to have many thousands of purchase orders, service orders, requests for quote, etc. that are tendered and committed in a short burst of time. Add to that all the unplanned purchases that arise during project execution, often directly from the field. When construction managers are facing situations where they have installation crews on site, but they're short on materials to finish the job, they need a rapid turnaround from the procurement team to get the materials out to the jobsite quickly.



## 2.1.5 Long-Lead Procurement and Expediting

The project procurement team will need to address long-lead items such as fabricated equipment and materials that need to be purchased well-ahead of time to account for drawings, manufacturing, design, shipping, etc. Long lead times require dedicated expeditors to monitor each stage of the process to ensure timely and quality delivery in order to coordinate with jobsite installation crews. Early identification of delays is critical to avoid budget and schedule overruns, and jobsite crews being paid for idle time waiting for shipments to arrive. Additionally, the procurement team will need to secure material supply well in advance to mitigate risk of availability, timing and price increases.



## 2.1.6 Management of Submittals and Engineering Drawings

Drawings and Submittals form the backbone of the design of any construction project. An engineering drawing will often be the source of the materials list (bill of materials) required to be procured in order to construct the elements in the drawing. Drawing packages will thus become an essential component of the procurement process along with the approval/award to the chosen vendors.

In addition to drawings, submittals are also integral to procurement. "Submittals is the process where the contracted party provides detailed information to the owner or their representative as to required material and/or equipment to be installed as part of a project." [2]. There is an ongoing back and forth of drawings and submittals that takes place between procurement buyer and vendors during both the tendering process as well as during execution.



## 2.1.7 Jobsite Inventory Management

Materials inventory for construction projects is managed quite differently than, for example, a parts warehouse or retail store. The goal with project inventory is to end up with no surplus materials by the end of the project; and when there are surplus materials, provide a solution for salvaging them or transferring them to other projects. The concept of 'stock' or 'reordering' is only done on an as-needed basis by the field admin staff, rather than automated by the procurement system. Also, when materials are received at the jobsite, they are tagged and associated to an engineering drawing, construction workpackage and tag number to correlate them with the appropriate installation and contractor.







## 2.1.8 Multi-Currency

It's often the case that major projects will be required to handle three-or-more levels of currency. The company, for example, may have its base currency in USD, but since the project is based in France, the currency of the project will be in EURO. Further, contracts or purchases done by the project procurement team may occur in various other currencies such as YUAN and GBP. This complexity in planning, change management and cost reporting needs to be elegantly handled by the project procurement system to ensure that accurate costing is rolled up to higher levels of the projects, programs and the level of the company.

## 03

# PROJECT CONTROLS AND PROCUREMENT

There is a tightly woven relationship between procurement and project controls that starts early-on in the project, during the upfront planning phase. It is important for these to be closely coupled in order to achieve complete cost, schedule, resource, measurement and cash flow details for the project[1]. This planning and cost information needs to be broken down by project work breakdown structure (WBS) and cost breakdown structure (CBS) for project controls to closely manage supplier and contractor information as intrinsic components of the project's finances and activities. Procurement plays a key role in project controls as it provides real-time costs, fully committed budget, inputs to project forecasting, vendor productivity monitoring and is an integral part of change order management. The next four subsections drilldown further on these.

## 3.1

### REAL-TIME, COMPLETE COST VISIBILITY

Providing project controls with current, accurate and complete visibility into project costs and activities is a core requirement of the project controls function. Real-time information enables early identification of issues so that corrective action can be taken early, to reduce the risk of the issue having a substantial impact on project cost and schedule. Without real-time visibility, the project team is confined to managing the project in the past. Keeping a complex project on track requires daily analysis and decision making. When procurement is managed out of the finance group, there tends to be a delay in getting cost information to the project team. This happens for two primary reasons:

- The finance department may not be recording costs at the time of receipt - or accrual. It is common instead to wait until the vendor's invoice is approved to recognize project cost. This puts the project at risk since vendor invoices can take weeks or months to show up.
- The project team is at the mercy of the finance department's processes and pace. Finance will commonly send periodic cost summaries (weekly, for example) to the project team as a data export from the ERP. This then needs to be re-keyed or imported into the project controls system. This is not only a cumbersome process; it introduces a delay that impedes project controls from swift reaction to project anomalies.

Project costs should be posted into the project controls system at the point of receipt and in real-time. When contractors achieve a milestone, or suppliers deliver materials, cost should be entered immediately on the project (at time of the accrual) to avoid a misrepresentation of total expenditures to date. This also provides an indicator to project management and controls regarding the status of vendor deliverables and performance.



## 3.2 REAL-TIME VENDOR PRODUCTIVITY MONITORING

In addition to posting real-time costs to the project, the project controls team need to continuously monitor vendor productivity to certify that goals, progress and milestones are being met to contractual satisfaction. When vendors are performing below plan, this needs to be addressed promptly to avert delays.



### 3.2.1 Penalties, Incentives, Disputes and Claims

The real-time data that's collected as part of procurement can be instrumental in both asserting and defending a dispute or claim. Claims are not uncommon and putting forth the best case is largely dependent on having the details - in terms of data - to back it up. Additionally, penalties and incentives are often written directly into contracts and require both the visibility into the contract, along with the information to support them, for when they're applied.

## 3.3 PROJECT COST FORECASTING

At regular intervals during project execution, the project controls team will produce cost forecasts to identify trends, issues, remaining spend, changes, and future project cash flow. "Cost forecasting begins with the current status of commitments and expenditures for the work packages or cost accounts being updated (to reflect actual amounts as of the date of the forecast)." [3]. The procurement team will play a major role in obtaining current and accurate data to feed the project forecasts. As they relate to procurement data, four primary inputs to a cost forecast are:

- **CURRENT ACTUAL COST.** A substantial portion of actual cost is derived from the receipts and cost accruals received from vendors as of the forecast date.
- **REMAINING COST TO COMPLETE.** Obtaining remaining cost data is typically a process that involves ongoing communications with vendors to measure progress to date and gauge remaining hours, materials and other costs to complete the job.
- **CURRENT PROGRESS (PERCENT COMPLETE).** Progress measurements are an essential input to forecasts and earned value management (EVM) metrics; and for contractors, are the basis for progress claims to recognize revenue. Generating an accurate measurement of current progress requires input from procurement on vendor progress, costs, etc.
- **CHANGE ORDERS.** Changes in budget and schedule will impact remaining costs to complete and thus the cost forecast.

## 3.4 PROJECT CHANGE ORDERS AND PURCHASE ORDER REVISIONS

Change orders are a regular occurrence on major construction projects. Regardless of the origins of the change - i.e. scope adjustments, unanticipated costs, RFI, etc. - it's likely that the change will influence one or more purchase orders or contracts. The contracts will have to be amended, or revised, to reflect the updates. This again enforces a close relationship between procurement and project controls.



# THE RISKS OF SEGREGATED PROCUREMENT

The discussion thus far has focused on the unique qualities of project procurement along with the need for a tight connection between procurement and project controls. Despite these assertions, it's far more typical for project procurement to be outsourced to a separate procurement department and separate system. This can lead to a somewhat dysfunctional and acrimonious relationship between project teams and procurement as the project team experiences frustration attaining the responsiveness, experience and timely results they need to manage and control projects. "The purchasing department may or may not save you money. Purchasing is a department that may help you in your quest for success or may stand in your way at every turn. Use them if they've proved helpful in a timely manner in the past. Avoid or work around them if they are difficult to deal with." [4]. This quote reflects a commonly felt sentiment from project controls and is an unfortunate and wholly avoidable situation that presents considerable risk to major projects. Risks such as:



## **INFORMATION DELAYS.**

A lack of current, accurate information on project cost, activities and progress.



## **THROUGHPUT BOTTLENECKS.**

Challenges getting responsive turnaround time for purchases and other procurement deliverables.



## **SILO EFFECT.**

A segregated procurement team has less vested interest in the success of the project than procurement that is embedded within the project team.



## **STRAINED COMMUNICATION.**

External procurement resources may not have the bandwidth to exchange the level of communication required by the project team. This leads to uncertainty as to the status of critical path items.



## **ERRORS IN COST CODING.**

It's likely that the ERP is not setup with the detailed level of project cost coding required for project controls and project procurement. This results in a mismatch of codes for allocation of committed and incurred on the project.



## **MISSED PROCUREMENT MILESTONES.**

Without a formalized procurement plan in place (as described in section 2.1.2 above), key tendering and purchasing milestones that lead to the timely delivery of items arriving at site can be easily out of sync with project scheduling milestones.



## **RECORDING OF REBATES.**

When purchasing large volumes of materials, suppliers will generally offer rebates which can have a significant impact on certain areas of project cost. This is often lost on the project team as it can be metabolized into the finance system and not recorded on the project; and if it is, not recorded at the right code level.



## 4.1 | SEGREGATED SYSTEMS AND TEAMS

Most organizations (or divisions) that execute on major projects will have a system in place for project management and project controls. Much like an ERP, but specialized for projects, these systems have the financial controls and auditability to manage complex finances with the same level of rigor and governance of the ERP. "Initially, this operational system might be a homegrown solution made up of spreadsheets and Word documents. However, this eventually leads to the project teams searching to evaluate a dedicated project cost management solution to make them more efficient, organized and profitable." [5]. While there can be some overlap with the functional footprint of the two systems, the design of each system is purpose-built for the goals and departments they serve. For example, even though both the ERP and the project controls system will likely have a solution to manage the procurement process, it is far more productive, and reduces risk, to maintain project-procurement activities within the project controls system. This is partly because of the fundamental relationship between project procurement and project controls but is also due to the fact that the project procurement system is tailor-made for the nuances of purchasing, expediting, tendering, cost control and vendor productivity monitoring required for major projects.

This does not preclude there being a centralized procurement department that services multiple purposes and divisions. The value of having experienced procurement professionals cannot be understated. Ideally however, one or more members of that centralized department should be embedded directly to the project team as dedicated project procurement resources that perform the procurement process in the project controls' system. If the organization has the procurement expertise and manpower in a specialized department, project controls will be happy to leverage that resource, as long as their key requirements around current, accurate and complete information, along with procurement planning and deliverables, are met.

## 4.2 | THE CFO MIGHT HAVE SOMETHING TO SAY ABOUT THAT

Despite everyone's good intentions, the finance department may not be comfortable with any procurement activity occurring outside the ERP. "The CFO and the whole finance team are heavily dependent on the trusted data that resides in the ERP and treat it as the protected vault of corporate financial information." [5]. This apparent conflict usually results in project controls backing down and accepting the wishes of finance, so are left managing projects in a data and skills deficit, putting projects at risk.

# 05

## AN INTEGRATED APPROACH

There is, of course, a way to bridge this impasse and adopt a solution that works for both project controls and finance. This is achieved by applying a financially controlled and trusted "data integration" between the two systems. By integrating data, each group - projects and finance - will get the information and timeliness they need without compromising integrity or control.

Systems integration is far from a new concept but nonetheless one that may be met with resistance and skepticism. Complex enterprise integrations can themselves be risky and costly, so may evoke dark stories of past integration failures. Nevertheless, recent advancements in integration technology platforms, and systems with robust integration capabilities, have made this a much more reliable and cost-effective solution than in years past. Additionally, in the context of this discussion on project procurement, the number of data points that need to be shared are minimal. As will be shown in the next section, as few as three data endpoints need to be shared for a successful integration that can satisfy both finance and project teams.



## 5.1 HOW A DATA INTEGRATION WORKS

Most modern software systems are equipped with integration toolsets in the form of an application interface (API) that enables the exchange of information on a common technology platform. Systems today are explicitly designed to play well with other systems, so have the hooks to make this synchronization possible. Further, there are third-party platforms built for the purpose of enabling multi-system enterprise integrations. In particular, the emergence of iPaaS software in recent years has made tremendous improvements in the ability of scalable integrations.

**iPaaS:** “iPaaS, or integration Platform as a Service, are platforms that standardize how applications are integrated into an organization, making it easier to automate business processes and share data across applications.”[6].



**FIGURE 3** - The iPaaS framework brokers the information exchange between enterprise systems

With data integration becoming a much more reliable approach, the standoff between project controls and finance can be mitigated with a trusted solution that allows greater collaboration between the two groups.

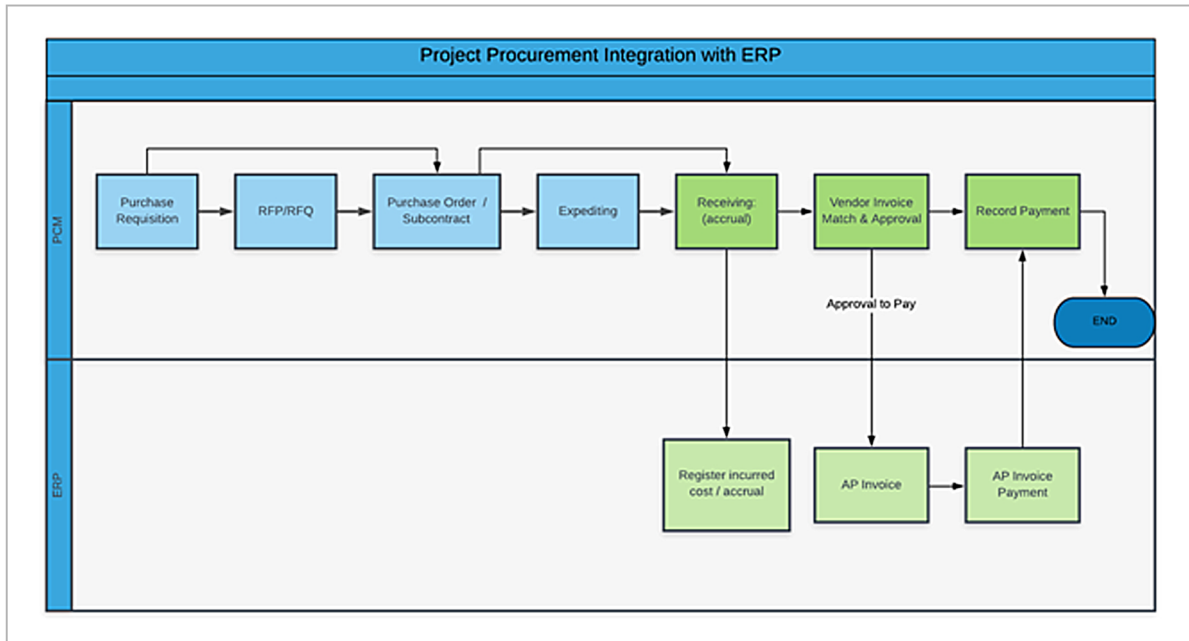
## 5.2 KEEP AN INTEGRATION SIMPLE AND REDUCE DATA POINTS

When designing system integrations, it's important to take a less-is-better approach. It's tempting to include more workflows and data than are truly necessary and overcomplicate what should be elegant and concise. Keep to a modest scope with minimal data endpoints, and bear the following constraints in mind:

- The data integration is solely between the Project Cost Management system (PCM) and the ERP
- For all data points, there is a defined Owner and Recipient
- The project procurement process is owned by the procurement module of the PCM
- The ERP is the recipient of the project procurement financial transactions such as: incurred costs (accruals) and approved invoiced costs
- The ERP is the owner of all vendor payments, and the PCM is the recipient of amounts paid
- Minimize duplicated effort and functions. There is normally no need to perform the same functions in both systems. Let one system do the work and synchronize the results.
- Only synchronize data that absolutely needs to be duplicated in both systems
- The ERP is the owner of master data such as: Vendors, Taxes and Currencies

## 5.3 | EXAMPLE PROCUREMENT INTEGRATION PROCESS FLOW – PCM-ERP

Figure 2 below shows an example process flow of the project procurement process, with data integration points.



**FIGURE 4** - Example integration process flow between the PCM and the ERP

This process flow as shown in Figure 2 is narrated below:



**PURCHASE REQUISITION.** A Purchase Requisition (PR) is generated at either the jobsite or the office and recorded within PCM Procurement. A PR can contain a mix of items to purchase (such as equipment, consumables or materials) or subcontracted services.

- The PR is then sourced within the business control of requiring tendering, or sole-sourced, to preferred suppliers by going directly to Purchase Order (PO) – bypassing any tendering phase



**RFP/RFQ TENDERING.** If a Request for Quote/Proposal (RFP/RFQ) is required, the purchase items are moved to an RFQ and the tendering process is completed in PCM Procurement.

- Whether sole-sourced or tendered, the items are then moved onto a PO in PCM Procurement



**PURCHASE ORDER / SUBCONTRACT.** The PO is validated against the project budget – and relevant cost codes – to ensure that there are funds available before the PO can be generated. The purchase order is approved, committed and issued to the vendor.





**EXPEDITING.** For long-lead items, an expediting phase may be required to oversee the successful and timely delivery of items to the jobsite for installation.



**RECEIVING.** Goods and services, and vendor progress, are received against the PO within PCM procurement. Receiving can occur at the jobsite, receiving warehouse or office. At the point of receiving, cost is incurred on the project against the correct CBS cost codes. This will also be reported as an accrual until the associated vendor invoice is approved.



**VENDOR INVOICE MATCHING AND APPROVAL.** The Vendor Invoice is matched, or verified, within PCM Procurement. This is the optimal system for invoice matching as it is also the place where the receipt (or progress claim) was also entered. Although this may require a change of process in that invoices may no longer be sent directly to Accounts Payable (AP) at the corporate office but are sent to the site administration office or the procurement office, matched against the packing slip (receipt) and validated for correct sales tax, freight and other miscellaneous charges that were not included in the purchase order commitments – which may result in an adjustment and costs to the project.



**INTEGRATION POINT #1 - APPROVAL TO PAY.** Once these invoices have been successfully matched, adjusted and approved, an invoice journal will then be sent from the PCM to the ERP. The invoice will indicate the vendor, invoice, purchase order, invoice date, currency and valid sales tax. It will also identify the project costs that are associated with the purchase order. The scanned invoice document will also be attached to the ERP invoice for control and review. These invoices are frequently validated against a control report to ensure that the invoices are correctly loaded. Controls are applied in the integration that restrict that the journal cannot be modified once it has been written to the ERP.



**AP INVOICE PROCESSING (ERP).** These invoices, once posted, will then be part of the regular AP payment



**INTEGRATION POINT #2 - AMOUNTS PAID.** To complete the process flow, the payment information is sent back to the PCM to indicate the payment date, currency, amount and exchange rate.





**INTEGRATION POINT #3 – ACCRUALS.** At the end of each month (or other accrual reporting frequency), a report is generated within the PCM that will identify the items that have been received but not invoiced. This will establish the monthly cost accrual that will be booked against the project within the ERP. This report is booked as an auto reversing journal.



### 5.3.1 Objectives of this Process Flow

This example process flow demonstrates that the project team can be the custodians of the project-procurement process while cooperatively working together with finance. The finance team are also getting the information they need and have control over the AP process. The objectives are driven by the following core criteria:

- It presents a single system to manage the life cycle of the project-procurement process for major projects which is closely tied to project controls
- It provides complete reporting from requisition to committed to incurred and expensed cost to the project
- It delivers real-time costs, and activities are recorded in the PCM for close management of the project
- It eliminates any disconnect between project change orders and purchase orders by providing a platform to integrate the management of change orders which are associated with purchase orders
- It ensures that all financial transactions are recorded in the ERP
- It recognizes that all payments of invoices are processed within the ERP

## 5.4 PROJECT REPORTING TO FINANCE

To make this a winning solution for finance, the project team can point to areas where they'll be able to provide more accurate reporting up to the finance team if project procurement is embedded into their team and system. Monthly accrual reporting is one example of important metrics finance will rely on projects to feed to them. If projects don't have current and complete vendor cost information, their reporting up to finance won't be current or complete either. As an integrated solution, both projects and finance will be continuously in sync with accruals.

## 5.5 INTEGRATION IS KEY

According to the JBKnowledge 2019 Construction Technology Report, "Companies must prioritize, and budget for, integration when choosing software and apps. Even at additional expense, technology that integrates allows communication between workflows and departments for cross-functional teams. It would be advantageous for companies to explore incentivizing integrations to reduce stress, optimize use-of-time, save money, and increase productivity. Seamless exchange of data reduces manual entry and redundancies, making integration a crucial feature for modern construction." [7]



## CONCLUDING REMARKS

The role of procurement in any company can be a complex, multi-faceted discipline that has deep connections to various other departments including legal, finance, projects and corporate. Organizations that engage in major corporate purchases – such as, for example, an airline buying a fleet of planes, or governments buying military hardware – will typically have a specialized procurement & supply chain department in respect to the intricacy of those purchases. For most organizations conversely, corporate purchasing is relatively straightforward (furniture, laptops, light-duty trucks); so there simply isn't the need for a centralized procurement department. In these cases, procurement is typically rolled into finance as a default, since that's where Accounts Payable lives. This is so common that it has become somewhat of an expectation by the senior members of the finance department who have, over the years, learned a sense of ownership of all procurement activity. As has been presented in this paper, this introduces a considerable impediment to the teams responsible for the successful delivery of major projects, since procurement plays such a vital role in the day-to-day good governance of the project's finances, schedule and vendor activities. A 3-year, \$100 million project for example, requires tremendous oversight to eliminate the risks of budget and schedule overruns, legal challenges, safety issues and other potential failures. Project controls professionals may well argue that a project of the equivalent size requires more oversight than a \$100m company, since so many things in a project can go horribly wrong in an instant. Quick identification of issues followed by an efficient recovery are therefore essential for successful project delivery. These realities are often lost on the finance department since, what goes on in the project world, is simply not on their radar. To concede any morsel of what they may view as their rightful responsibility and territory, i.e. procurement, therefore, is most often met with resistance.

Despite this sense of discord, clearly all members of all departments are deeply interested in what's best for the whole company over and above the interests of their own department, and no-one wants their wishes and decisions to hinder corporate profitability. An elegant compromise between projects and finance, consequently, needs to be openly negotiated. This is more easily said than done since it's rare for finance to be eager to give up any control of procurement. Regardless, this compromise needs to be achieved – and is best done through a well-designed system integration that serves both departments. To make this a success, both sides need to be first, engaged, and second, open to making strategic concessions for the greater good.

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