

Process Documentation Case Study

Scenario

ABC Builders is a residential construction and remodeling company that has been in business for more than 40 years. Their services cover the lifecycle of a home from initial design, building new structures, and remodeling older structures.

The company has two divisions. New Structures designs and builds concrete and wood-framed houses. This division is growing quickly and has added two new offices within the state. ABC hired more people to support growth, but turnover has been on the high side. They are not getting the output they desire, causing ABC to miss targets and experience an increase in rework. Overall, revenue is increasing but the profit margin is not growing due to the added costs.

The Remodeling division is experiencing more modest sales growth. Staffing levels have not changed, nor has performance.

Both divisions are supported by the same back office administrative group, which includes Sales & Marketing, Design & Modeling, Project Management, and Finance. The growth in New Structures is straining administrative performance in support of both construction divisions, especially in the accounting, human resources and 3D modeling processes. Many of the supporting workflows, logs, software tools and forecasting techniques were created ad hoc over multiple decades. Newer employees struggle to use these methods, especially as long-service employees retire

Continued growth is projected but will not be sustainable without redesigned/standardized business processes – especially as more senior leaders retire.

ABC Builders hired Orion to streamline, standardize and document its business processes with the goals of:

- Improving workflow between the construction divisions and the administrative units within the back office
- Eliminating inefficiencies and handle failures that cost ABC time and/or money.
- Increase productivity at existing staff levels so that scaling up increases profitability.
- Capture critical knowledge before senior leaders and long-service employees retire.
- Create a process documentation/knowledge-sharing system that will improve our boarding and foster consistent performance

Project Approach

Orion has a standard, five-phase model for business process documentation projects:



Given the goals and structure of ABC Builders and their preferred timeline, Orion adjusted this model to include the following steps:

1. **Identify the process to be mapped and establish scope-** what are the process beginning and endpoints? Are there inclusions or exclusions that need mentioning for clarity?
2. **Document the current situation.** This involves defining the “As Is” process and collecting data on key process metrics to establish a baseline of performance.
3. **Identify potential process problems and their corresponding root causes.**
4. **Define the future state process.** Refine / redesign / reengineer the current process based on the learnings from steps 1-2-3.
5. **Implementation.** Putting the new process in place by providing the solution investment, communication, training, and change management required for success.

1. Identify the Process and Establish Scope

Process Identification

The **Setup Process** in the New Structures division was selected as the initial process to be mapped. The reasons this process is so critical are

- a) It was complex and easy to mismanage, particularly for inexperienced staff,
- b) It had never been formally documented before- one of the leaders carried all the knowledge in his head (this had been sufficient when the company was small, but they had grown to the point where it was impractical), and
- c) Errors in this process cascaded into more complex and expensive problems downstream.

Purpose Statement- Setup Process

The purpose of the setup process is to position ABC Builders to execute a project efficiently and meet the requirements of budget and schedule.

Scope (Beginning and End Point)

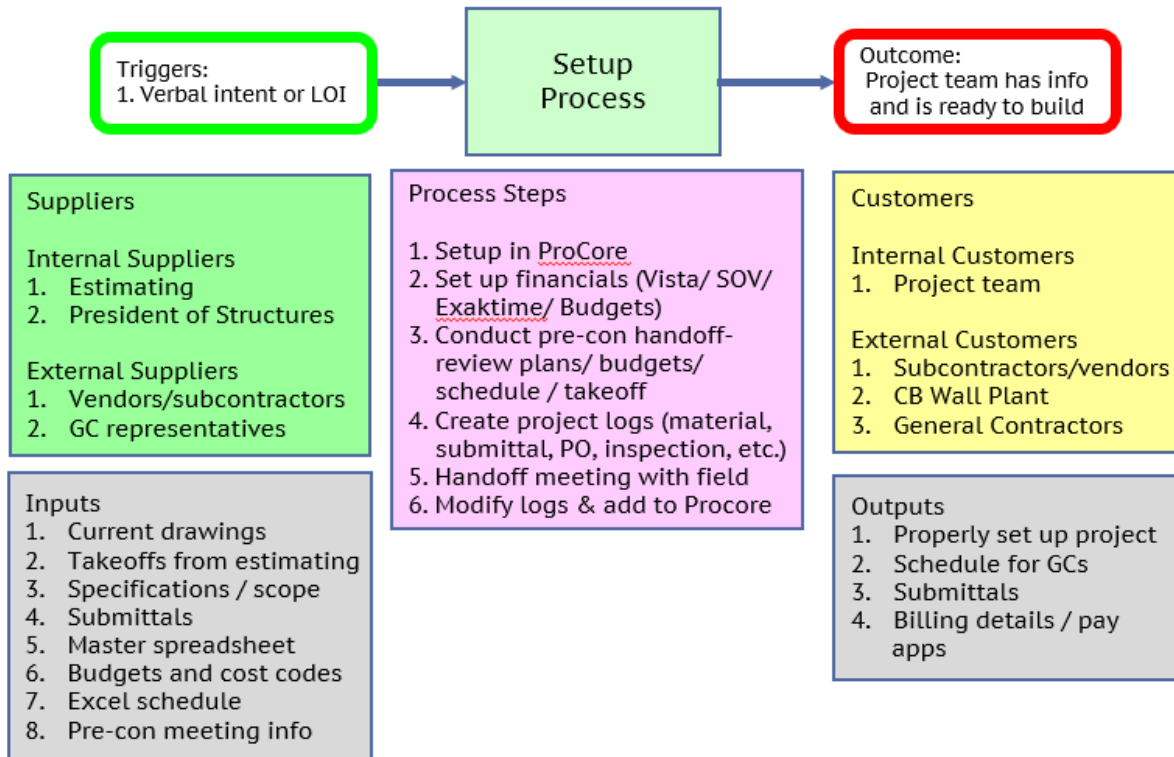
The setup process begins when ABC has verbal intent / LOI that the project will be awarded.

The process ends when the project team has received all information that is needed to build the job from the pre-construction team.

For the remainder of the case study, text that is part of the process documentation work products will be presented in Times New Roman. Commentary from Orion will be in this blue typeface.

2a. Document the Current Situation- the System Map

The purpose of a system map is to get a “big picture” overview of what is happening around the process. The pink box in the example below shows the major steps at a 30,000-foot level, and the remainder of the diagram focuses on what is coming into the process (and from who) and what is going out of the process (and to who).



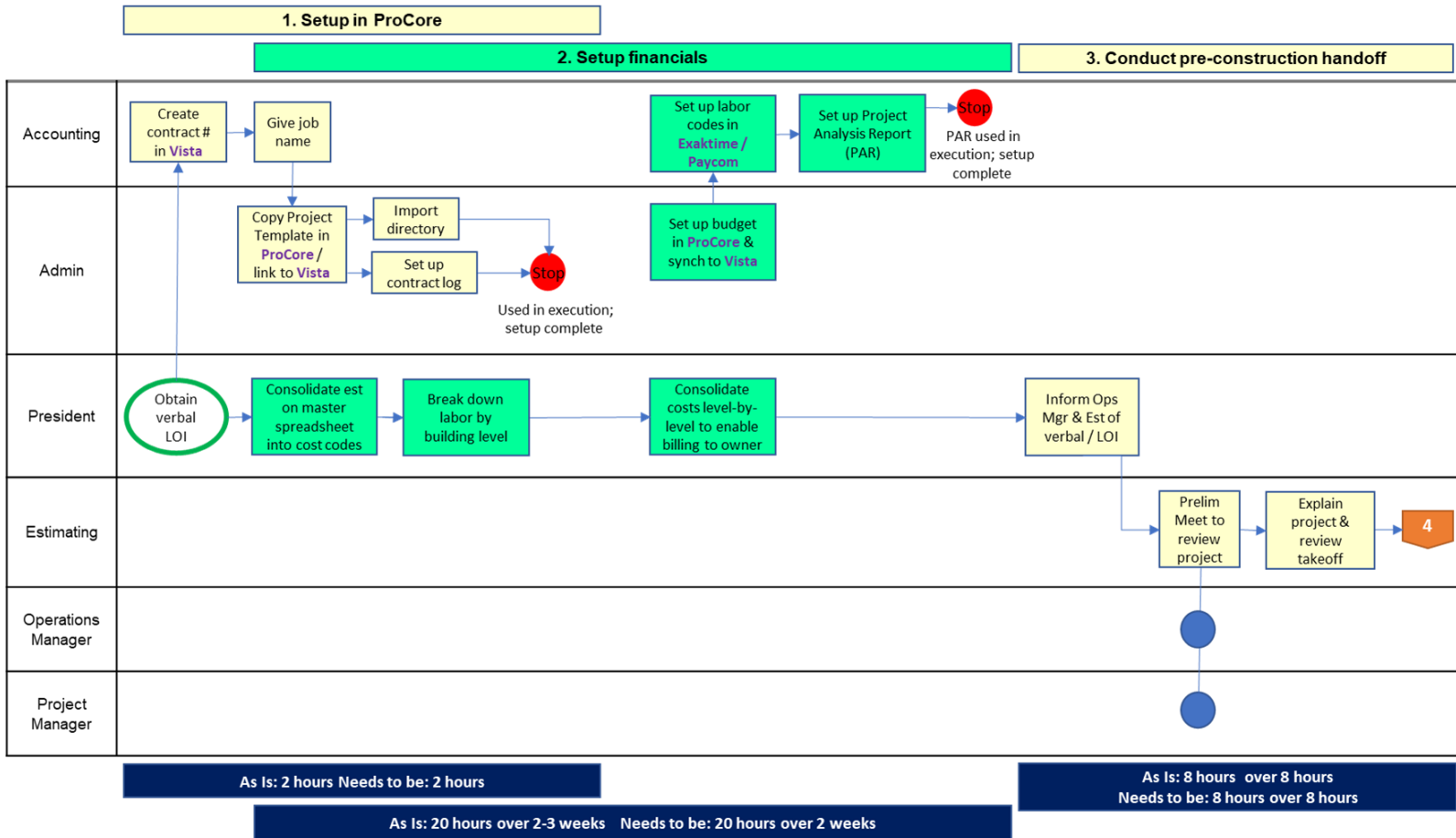
A sample “find” from the system map development was that the President of Structures saw himself as a process participant, not as a supplier. When the team talked through the number of major projects active and on the runway it became immediately apparent that one person could not provide adequate oversight without becoming a major time constraint. This was instrumental in convincing the President he had to cede control over this process to other trusted members of the team.

Additional issues identified can be found in the **Identify potential process problems and their corresponding root causes** section.

The second step in defining the current situation involves creation of an As-Is process map showing how the work is performed as of today. The cross-functional process map is illustrated on the next three pages.

Process: Setup Process

2b. Document the Current Situation- the Cross-Functional Process Map- "As Is"



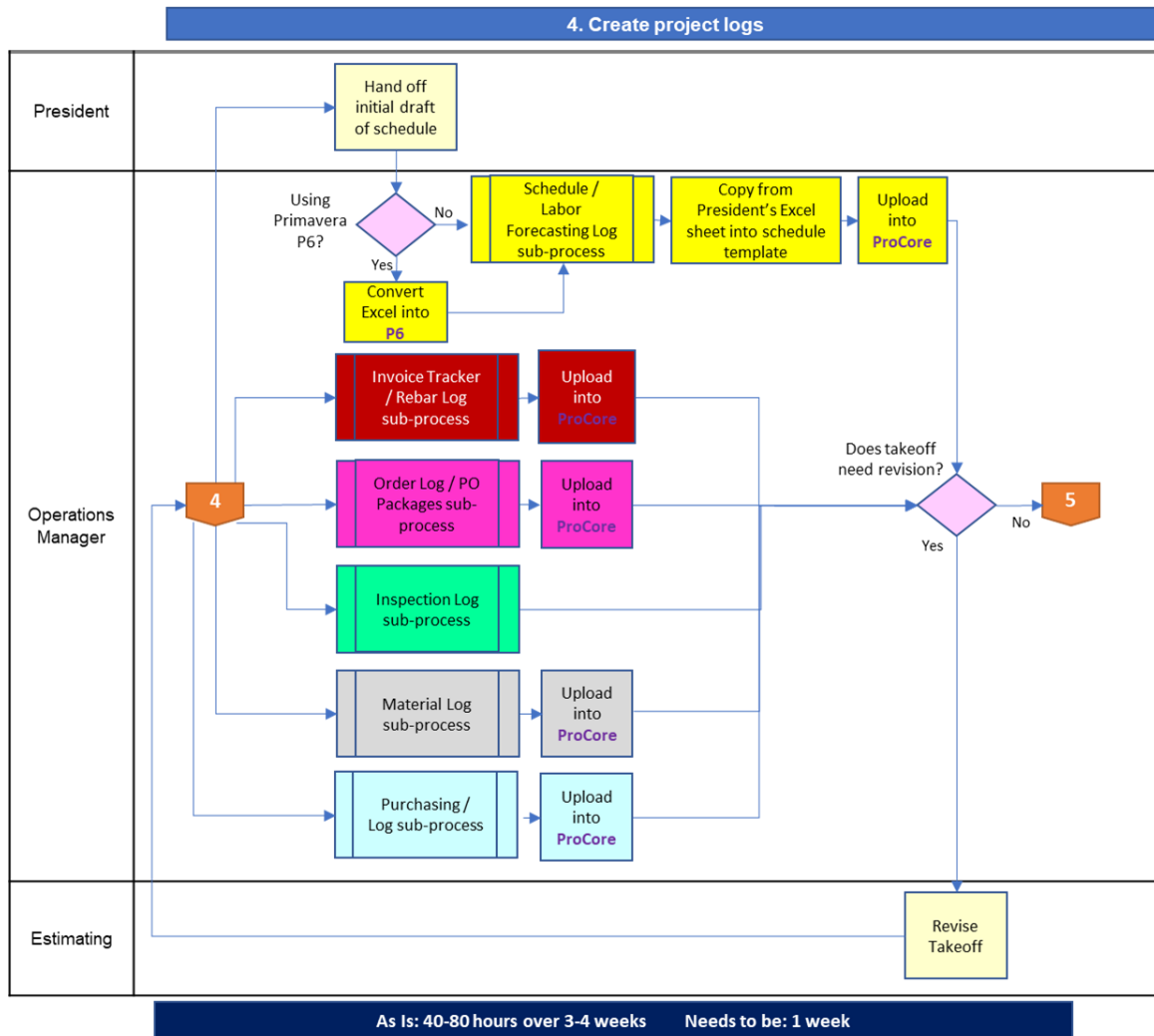
Note: Admin sets up the contract log, and then no further action is taken with it during the setup process.

Note: Accounting sets up the Project Analysis Report, and then no further action is taken with it during the setup process.

The green steps correspond to setting up financials; the processes for setting up in ProCore and setting up financials run concurrently.

The navy rectangles along the bottom show how long each main step takes and is targeted to take.

Process: Setup Process

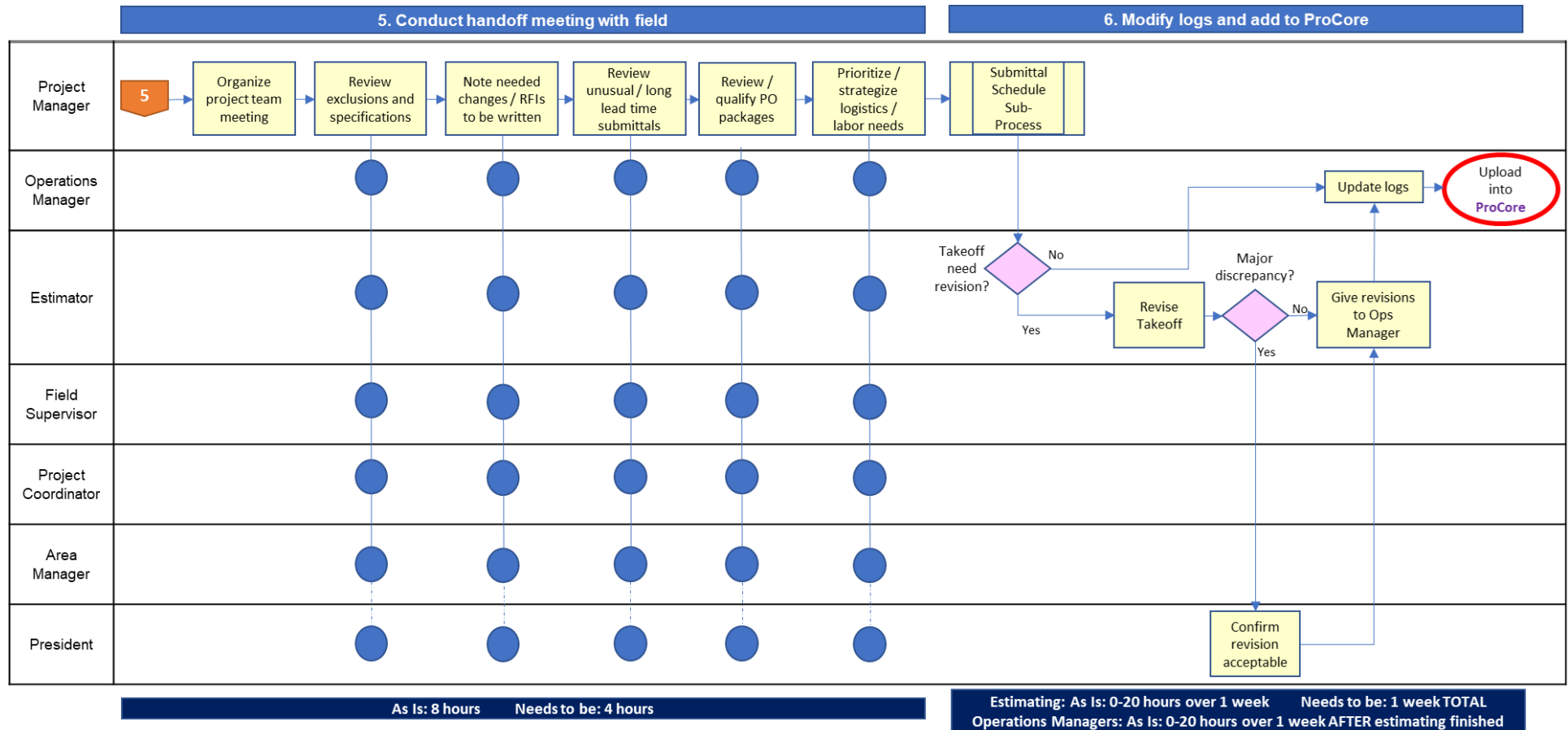


Note: Operations Manager is charged with creating multiple project logs simultaneously. They are color coded for viewing convenience and correspond to the detailed explanations in the Log Management table that follows.

Note: the symbol is used to indicate that there is a sub-process to drill down into. It is a convenient way to illustrate the overall process flow on the top-level screen and still connect to the details for the process practitioners that need to dig deeper.

Note: Takeoff revision sends process back to the beginning of step 4, necessitating rework; logs must be redone to reflect changes.

Note: This step highlights the manual nature and complexity of the process; became completely impractical as the company and the projects it was working on grew larger and larger. **Navy** indicates that this portion took 3-4 weeks & needed to be one week for competitive reasons.



Note: The blue circles show shared responsibility. The top six people / departments / swim lanes all have a stake in the handoff meeting and are responsible for executing the portion of each step that applies to their specific area. President may or may not attend the meeting, so the line is dotted to his swim lane.

Note: The blue circles also highlight the challenge in getting many people together. It can cause delays, especially when senior leaders are involved.

2c. Document the Current Situation – Systems / Logs Used in the Process.

It is not uncommon for a client to ask Orion to highlight the systems used within the step-by-step instructions. The table on this page is an artifact requested on occasion. The detailed descriptions on the following pages were developed specifically for ABC. This was essential since many of their logs were created on an ad hoc basis over several years. Usage is not standardized.

The systems / logs used in this process and their designated purpose are as follows:

System / Log	What does it do?
ProCore	Main project management hub; web-based tool.
Vista	Accounting program enabling tracking of financials.
Keystyle	Invoice routing program.
Exaktime	Mobile time clock that tracks in house hourly labor.
Paycom	HR payroll software that contains labor cost codes.
Sharepoint	Tracking system that enables us to keep track of documents / information (takeoffs, bids, contracts, etc.).
Primavera P6	Critical path scheduling program; updates automatically based on actual dates.
Schedule Builder	Takes preliminary schedule and works out manpower and duration to refine schedule. Combination of original schedule and labor budget.
Invoice tracker / Rebar log	Weekly subcontractor SOVs tracks work completed, payments made and rebar invoicing.
Inspection log	Checklist for field supervisors to do quality control... this one is in ProCore, rest are in Excel.
Material log	Composition of several- lumber, rebar, etc. Used to determine whether in budget / how much is left / are we over or under. Tracks versus estimate. Also used for invoicing.
Purchasing log	Log in all purchases for invoices / tracking what has been approved
Order log	Used for field to request materials / release packages of materials. Also an “extra” order for miscellaneous orders not on POs.
PO Packages	Pre-created material purchase orders... not a log, the actual orders. Created same time logs are.
Submittal Schedule	Keep track of everything submitted (or to be submitted) for approval and the status of accepted or not.

Details on log setup and use are as follows:

Logs	Setup Owner	Setup Process	Users / How Used	Comments
<p>Schedule / Labor Forecasting log (includes Change Order tab & Construction punchout)</p>	<p>Operations Manager</p>	<ol style="list-style-type: none"> 1. Operations Manager obtains prelim schedule from president 2. Operations Manager takes labor budgets and prelim schedule info and processes through Schedule Builder, giving estimated manpower and duration of work. 3. Operations Manager revises schedule based on information. 4. Operations Manager sets up Change Order tab in this file that informs of fully approved changes- it will begin blank. 	<p>Superintendent and Area Manager update this log frequently. They enter dates and the program calculates what is left to complete (\$/days).</p> <p>When weekly labor reports come in, Project Manager and Project Coordinator put numbers into Payroll Entry tab to automatically forecast labor and budget and punchout tab gives a visual look at punchout.</p>	<ul style="list-style-type: none"> • Setup is a process that requires training and process knowledge to execute properly. • There are separate tabs- Schedule and Forecast / Plan- that are in the same file so are listed together. Ditto Change order tab and Construction Punchout tab. • Construction punchout tab doesn't require setup. It is updated by Superintendent weekly post-setup. • Operations Manager is in charge of maintenance and adjusts schedule as needed, but it is infrequent.
<p>Invoice Tracker / Rebar Log</p>	<p>Operations Manager</p>	<ol style="list-style-type: none"> 1. Operations Manager puts all supplier / subcontractor SOVs on 1 Excel spreadsheet 2. Operations Manager updates rebar / invoice tracker log with <ol style="list-style-type: none"> a) estimates from takeoff b) setup by buildings and levels and sections. 	<p>Area Managers, Project Managers, Project Coordinators, and Operations Managers use this log to release weekly subcontractor payment and track invoices.</p>	<ul style="list-style-type: none"> • Setup is a process that requires training and process knowledge to execute properly. • Ownership stays with Operations Manager after setup, for changes and updates. • Operations Managers want control over SOV.

Logs	Setup Owner	Setup Process	Users / How Used	Comments
Order log / Extra Order Log / PO Packages	Operations Manager	<ol style="list-style-type: none"> Operations Manager creates order log template that initiates PO packages. Operations Manager takes material quantities from estimate and places into Excel spreadsheet for individual operations packages. 	<p><u>Superintendent</u> makes entries in order log to release packages as needed and request delivery dates.</p> <p><u>Project Coordinator</u> uses log to take orders that are already created to buy / send / shop out to vendors to get the best price.</p> <p><u>Project Manager</u> and <u>Area Manager</u> oversee log usage; PM approves extra orders.</p>	<ul style="list-style-type: none"> This process is not considered extremely difficult, but it is time consuming. Operations Manager is in charge of maintenance and must update after revisions from package qualifications.
Material Log	Operations Manager	<p>There is a Daily Concrete Log (DCL) AND a Concrete Material Log (CML)</p> <p>DCL: Operations Manager copies / pastes template from base template to the new job.</p> <p>CML: Operations Manager adds quantities from estimates to spreadsheet</p>	<p><u>Superintendent</u> completes DCL once job starts (after setup done)</p> <p><u>Project Coordinator</u> maintains CML once job starts (after setup done)</p>	<ul style="list-style-type: none"> Project Coordinator is in charge of maintenance, which is a post-setup process.

Logs	Setup Owner	Setup Process	Users / How Used	Comments
Purchasing Log	Operations Manager	Operations Manager takes estimates and populates ordering material tab.	<p><u>Project Coordinator</u> enters orders as PO's are created in ordering material tab. As invoices received, PC enters them into Invoice Entry tab.</p> <p><u>Project Manager</u> is secondary approver of the invoices logged in invoice entry tab.</p>	<ul style="list-style-type: none"> Operations Manager is in charge of maintenance. Not frequently needed... only when errors occur.
Submittal Schedule Note: Created by Project Manager, potentially after the handoff meeting.	Project Manager	<ol style="list-style-type: none"> Project Manager gives Project Coordinator draft template Project Coordinator creates draft in ProCore Project Coordinator updates as additional submittal come in. 	<p><u>Area Managers, Project Managers, Project Coordinators,</u> and <u>Superintendent</u> each verify that materials being used on the job are approved.</p>	<ul style="list-style-type: none"> Project Coordinator is in charge of maintenance, updating and closing once complete. Project Coordinator has to extract from GC ProCore because Structures has own ProCore. (Extra step needed because two diff systems / two diff companies) Project Manager noted as sharing responsibility for ongoing maintenance.

2d. Document the Current Situation- Step-by-Step Procedure

1. Setup in **ProCore**

- 1.1 President obtains verbal LOI to initiate the process
- 1.2 Accounting creates contract number in **Vista** and gives job name.
- 1.3 Admin copies project template in **ProCore** and links to **Vista**.
- 1.4 Admin imports directory.
- 1.5 Admin sets up contract log.

Notes:

- **Keystyle** is an invoice routing system that is automatically activated when other financial systems are used. Mentioning it because it is listed in the systems table.
- This is not a time-consuming step; estimated two hours of work.

2. Setup Financials

- 2.1 (Budget) President consolidates estimate on master spreadsheet into cost codes.
- 2.2 (Budget) President breaks down labor by building level.
- 2.3 (Budget) Admin sets up budgets in **ProCore** and synchs to Vista.
- 2.4 (Budget) Accounting sets up labor codes in **Exaktime** / **Paycom**.
- 2.5 (Budget) Accounting sets up Project Analysis Report (PAR).
- 2.6 (SOV) President consolidates costs on level-by-level basis to enable billing to owner.

Notes:

- Setting up the financials takes an estimated 20 hours of work over 2-3 weeks. Team felt that 20 hours is reasonable, but needs to be completed in 2 weeks max. As project volume rises this gets more and more difficult.
- Runs in parallel to setting up in **Procore**; one doesn't wait for the other.

3. Conduct Pre-construction handoff

- 3.1 President informs Operations Manager and Estimating we have verbal / LOI.
- 3.2 Product Manager, Operations Manager and Estimating meet to review project.
- 3.3 Estimating explains project and reviews takeoff.

Notes:

- This portion of the process consists of one all-day meeting. Not a lot of room for improvement / shortening the cycle time.

4. Create Project Logs

- 4.1 (Schedule) President hands down initial draft of schedule. If project management software **Primavera P6** is to be used, the draft will be converted into **P6** before moving to step 4.2. If not, move straight to 4.2
- 4.2 (Schedule) Operations Manager executes Schedule / Labor Forecasting Log sub-process.
- 4.3 (Schedule) Operations Manager copies schedule from President's Excel sheet into scheduling template.
- 4.4 (Schedule) Operations Manager uploads into **ProCore**.

- 4.5 (Invoice Tracker/ Rebar) Operations Manager executes Schedule / Labor Forecasting Log sub-process.
- 4.6 (Invoice Tracker / Rebar) Operations Manager uploads into **ProCore**
- 4.7 (Order) Operations Manager executes Order Log sub-process.
- 4.8 (Order) Operations Manager uploads into **ProCore**
- 4.9 (Inspection) Operations Manager executes Inspection Log sub-process in **ProCore** (sets up tasks in field- basically a quality control checklist)
- 4.10 (Material) Operations Manager executes Material / Concrete Log sub-process.
- 4.11 (Material) Operations Manager uploads into **Procore.**
- 4.12 (Purchasing) Operations Manager executes Purchasing / CMU sub-process.
- 4.13 (Purchasing) Operations Manager uploads into **ProCore.**
- 4.14 If takeoff does not need revision at this point, process moves to the handoff meeting phase. If takeoff does need to be revised, estimating will perform the revision. The process then may revert back to the step 4.1 and require significant rework redoing logs.

Notes:

- There are multiple logs to create- Purchasing, Material, Schedule, etc. While the steps above are shown consecutively for ease of reading, they can be done independently and in different order from job to job.
 - Much of this work is straightforward, but the team felt that the scheduling log and invoice tracker log both require training and significant experience to manage properly.
 - Invoice tracker log can happen simultaneously with the first several logs, but can't be completed until all contracts are executed.
 - The flowchart does not completely illustrate the complexity of the Operations Manager position, as multiple projects may be going on simultaneously in addition to other duties.
 - Project Manager is working on contracts parallel to this process. Operations Manager informs Project Manager logs are ready so Project Manager knows what is going on.
 - This step consumes an estimated 40-80 hours of resource time, and the target is to complete it in one week- need to share effort between resources to get to the goal.
5. Conduct handoff meeting with field
 - 5.1 Project Manager organizes meeting between Operations Manager, Field Supervisor, Estimator, Project Manager, Project Coordinator, and Area Manager to get together for review of plans / Purchase Orders / Project logs / logistics.
 - 5.2 Group reviews exclusions and specifications
 - 5.3 Each stakeholder makes notes of changes that need to be made / RFIs that need to be written.
 - 5.4 Group reviews submittals that are unusual or that have a long lead time.
 - 5.5 Group reviews / qualifies PO packages.
 - 5.6 Group prioritizes / strategizes logistics and manpower needs

Notes:

- President sometimes attends the meeting.
- All members are expected to handle issues that come up that are related to their own area of expertise, but there isn't a system in place to verify it actually happens.

6. Modify logs and add to **ProCore**
 - 6.1 Project Manager creates submittal schedule in **ProCore**
 - 6.2 If takeoff does not need revision after the handoff meeting, Operations Manager updates project logs as needed and skips to step 6.6.
 - 6.3 If takeoff revisions are needed, Estimator revises takeoff.
 - 6.4 If a major cost discrepancy exists once takeoff is revised, the Estimator must confirm with President that revision is acceptable before moving to step 6.5.
 - 6.5 Estimator gives revised takeoff to Operations Manager.
 - 6.6 Operations Manager updates logs and uploads final revisions to **ProCore**.

Notes:

3. Identify Potential Process Problems and Corresponding Root Causes

The discussions that occur during process documentation workshops and inevitably unearth process problems. These are tabulated every step of the way and evaluated at this point. The tables below show the results of grouping process problems into common themes for organizational reasons.

Topic	Process Issues
Log Management	<ol style="list-style-type: none"> 1. High number of logs to keep track of makes it difficult to manage all info and keep them up to date. 2. Ops Mgrs. get pulled away to other responsibilities as volume increases, creating delays with log creation 3. Possible typos in log entries result in subsequent stakeholders getting the wrong information 4. Several sub-processes happening in parallel can increase process complexity 5. Lack of time to execute. (“typical” Cycle time is about a month, and “typical” process time 250-300 hours) 6. Inaccurate field use of logs (new people in field) results in lack of use / chaos / delays in material arrival, delay in payment. 7. Inaccurate rebar log setup can produce results in inability to compare estimates to actual. 8. Inspection log process is time consuming; have templates, but we need to expand / refine to fit today’s business. 9. Need to have executed contract to tell if we have the right versions of drawings due to access / document version control issues. Can cause log / takeoff revisions. 10. Typos can create downstream problems
Financial Setup	<ol style="list-style-type: none"> 1. Potential delay with budget due to single resource executing. 2. Finance delayed in setup because they don’t have budgets (happening more lately due to higher volume). 3. Official budgets need to get to accounting earlier so they can get started; limit number of errors later on.

Heading	Process Issues
Estimating	<ol style="list-style-type: none"> 1. Poor estimates can render us unable to compare estimate versus actual, result in incorrect quantities, etc. 2. Time consuming to do takeoff on hardware prior to award, which can cause delays later in the process or mess up PO packages. 3. There's no standard agenda for the estimating meeting, and the resulting variation can cause process problems downstream. 4. (Short term problem) Estimating is responsible or loading plans into ProCore. New person for last month = no one has been doing it. 5. As number of estimators increases, so does the probability of problems. 6. Time lag between end of takeoff and start of setup forces estimating to re-learn the job. 7. Major discrepancies in takeoff at the end of the process may result in need for president taking appropriate business actions (price changes, etc.). Are there implications on setup???
Project Management Prep	<ol style="list-style-type: none"> 1. Project Manager doesn't get schedule, budget, and master spreadsheet on day one. 2. Project Manager does not have access to plans in Bidshare. 3. Do not currently have a standard template as a starting point for submittals. 4. Need to reexamine the weekly payment process for subcontractors because we are processing their payments for them, increasing our workload. 5. Large changes needed in steps 5-6 can have large operational implications.
Communication	<ol style="list-style-type: none"> 1. Project team meeting should happen for all jobs, but if we are too busy, we skip it. Causes downstream problems if we don't get everyone on the same page. 2. We <i>believe</i> there is a standard meeting agenda for the project team meeting, but we're not sure we use it as diligently as we should. 3. Multiple people are updating, so one person not doing it / on time can impact execution. 4. Need to improve info flow from estimating to the project team. Op Mgr. attempts to decode language between two, but they are overloaded. Need to remove middleman. 5. Information exists in multiple formats, creating potential for missed communication / mistakes. 6. PM does not typically have a specific agenda for the handoff meeting, making it more difficult to check off items that have been completed. 7. Potential for missed communication; everyone is responsible for taking own notes and making own changes post handoff meeting.

Root cause analysis is the next step. Orion had to dig into some of ABC's areas to determine what the true underlying issues were. As this discussion typically involves specific and identifiable problems, it is not included in this report for proprietary reasons.

4. Define the Future State Process

Suggestions for improving setup process performance were as follows below. The team incorporated some of the ideas into their new process design. Not shown for proprietary reasons.

1. Break down budgets into two chunks- project and labor. Do and release the project budget right away so setup can move forward, then do labor budget (at latest) one week prior to project start.
2. Set up one code with one budget as a holding place, so if we decide to do it ourselves we'll be positioned for it... but we can still sub it out.
3. Review recent jobs and build a budget template that works for 80%+ of the projects we will see. Enlist *Excel Help* to set up a spreadsheet to auto-generate.
4. Determine whether Oxley can be of assistance in producing a preliminary schedule, which can reduce pressure on President.
5. Have President train internal resources to set up financials and schedule; would increase both speed and capacity while reducing risk.
6. Consider appointing a resource to focus on change orders to relieve pressure on this process.
7. Determine whether there is a better way to setup/manage the schedule log that integrates **P6**.
8. Combine invoice log with pay app to make it one step versus duplication.
9. Create quantities for order log from master spreadsheet estimates.
10. Auto-populate SOVs in invoice tracker log.
11. Simplify rebar log by adding field / column for Building.
12. Look at how "miscellaneous" ordering is handled / entered into systems.
13. Create online ordering form for the Proj Coord to order miscellaneous items and avoid multiple entries / phone calls when ordering.
14. Drop inspection log (for now). Note: has been deleted from log table contained herein.
15. Add to **ProCore** punchout.
16. Drop Fuel log.
17. Drop Tool log.
18. Drop tool inventory cost log.
19. Drop water / ice delivery log.
20. Determine how we use Safety Inventory log.
21. Determine how we use the hardware log and whether it is needed.
22. Rename Miscellaneous log- now it will be Trucking log.

5. Implementation

Actual implementation plans are not shown for proprietary reasons. However, Governance and Approvals are included since they are important to support consistent performance post implementation.

Documentation Governance

Process documentation will become outdated and ultimately useless to process performers without proper governance. Just as a manager or leader should own the process, there must be a “steward” who is responsible for periodically validating that the documentation matches current work standards. This person should also be responsible for making sure that any changes or improvements to the process are communicated to all stakeholders. The owner and the steward can be the same person. For the Set up Process at ABC, the process documentation must be revalidated every six months.

Process owner:

Documentation steward:

Frequency of validation:

(How often must the process owner or documentation owner signoff that the procedures are current?)

Every 3 months

Every 6 months

Every 1 year

Every 3 years

Approvals

The undersigned leaders affirm that the above documentation describes how this process should be performed in order to achieve the state business goals.

Process Owner

Signature

Title

Date

Documentation Steward

Signature

Title

Date

Department Manager, Director or Supervisor

Signature

Title

Date