A PRACTICAL GUIDE TO

DESIGN & BUILD

BUSINESS

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91 square feet™ | R'DASH

TABLE OF
CONTENTS

WHO CAN USE THIS GUIDE?

This is a practical guide for professionals and students preparing for interviews in real estate and construction companies. It offers insights into the inner workings of a construction/ architecture company and gives you a good understanding of the types of problems you might be solving after joining or starting a company in this domain.

Most of the content in this guide stems from my personal experiences of establishing a design and build company, [91Squarefeet](#). After spending a significant time understanding the challenges of the construction industry, we encapsulated our learnings into a software called [RDash](#). While writing this guide, I have found it beneficial to use RDash as an example, as it creates a visual context.

This guide will help you learn about various phases of a project along with the typical day-to-day challenges. I endeavour to nudge you into a problem-solving mindset around solving these challenges by offering advice on how you can tackle these in a resourceful manner.

[Video](#)

EMERGING OPPORTUNITY IN DESIGN-AND-BUILD

Twenty years ago, architects and contractors had distinct roles in India's construction market. Architects focused on designing spaces, while contractors handled on-site work. Clients often hired project management consultants to coordinate between the two.

Economic reforms at the start of the 21st century sparked rapid growth in infrastructure spending. This allowed the industry to evolve quickly. Companies like Hafeez Contractor, LnT & JLL started developing complementary skills. Construction companies expanded their design expertise, and design firms built procurement and project management capabilities. This shift led to the emergence of the design and build era, where companies offered a one-stop solution for construction and fit-out projects.

? Why did these companies pursue becoming design and build firms so aggressively, even when their original businesses were successful?

The key reason is the potential for higher profit margins. When projects are divided among architects, consultants, and contractors, profits decrease for each party, and the client's bargaining power increases, further reducing supplier margins. By integrating services, companies could retain more profits and have greater control over projects.

💡For a typical construction project, a contractor's margin is twice as high, and an architect's margin is ten times higher when they offer both design and build services compared to just doing construction or design work alone.

However, managing both, design and construction simultaneously increases the complexity of business operations. This is where technology becomes powerful in the current construction context. Established market players will take time to upgrade their technology to adapt to this sector's dynamism, providing an opportunity for new entrants to adopt technology.

They can operate more efficiently than existing companies, disrupting the sector. This is our vision for RDash - empowering new-age design and build companies to operate with increased efficiency and agility.

FUNDAMENTAL PROBLEM IN CONSTRUCTION
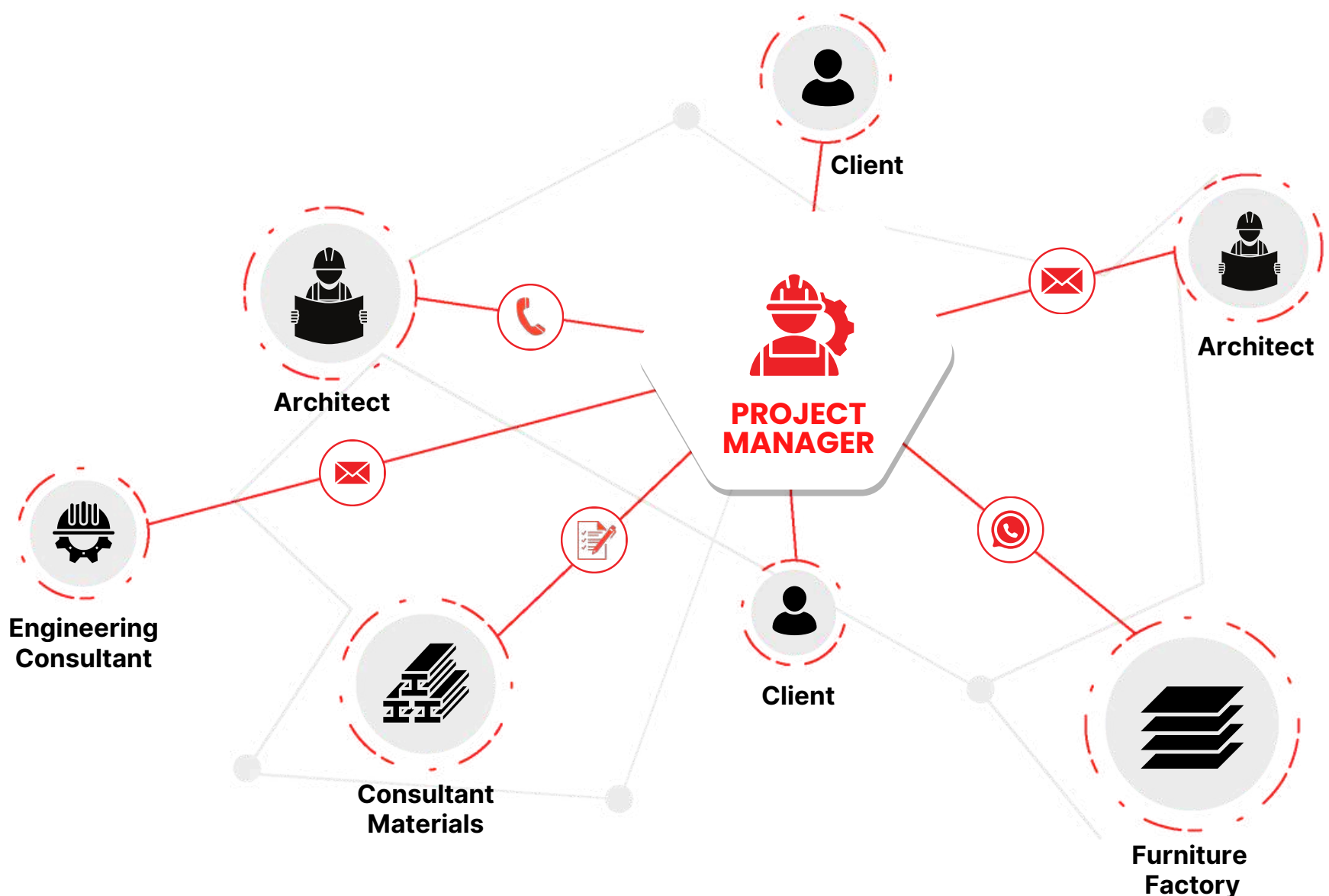
Even in the simplest projects, over 20 stake-holders collaborate, which is where mistakes are frequently made. Consider a scenario where you're a project manager for an office fit-out project.

During the project, a contractor identifies a discrepancy between the proposed plan and the actual site condition. An AC duct is cutting through a beam, prompting the contractor to alert the MEP consultant. This consultant must involve the architect, as the solution will affect other aspects such as ceiling design and available space height. The architect proposes using cassette ACs instead. As a project manager, you must coordinate this change with the procurement team, MEP contractor, civil vendor, AC vendor, and of course, the client. Even small changes can have a butterfly effect, creating a significant coordination workload for project managers.

There is currently no standard method to manage this, and each project manager and organization handles it in their own way. The lack of a proper technology system to correct this coordination issue typically results in a 10% increase in project costs and a 20% delay. This is why organizations lose agility in project management, resulting in idle site labor, wasted materials, and piled-up overheads.

When we think or talk about technology in construction, we often envision robots laying bricks, 360-degree cameras creating virtual walkthroughs, or site work quality analysis using smart devices. India's construction sector will eventually adopt these emerging technologies, but first, we need to address more fundamental issues.

Creating and adhering to certain project management template that consolidates all information - such as site survey data, design files, project scope, procurement, site progress, material tracking, reimbursements, audits, and handovers - into one place is helpful as it will create a single source of truth for everyone involved. 95% of construction companies in India do not have a particular system to clearly understand what percentage of profit margins they are finally making on their project. When industry is in such a state, fixing workflows to weed out day-to-day operating issues and induce professionalism in the workforce is the foundational work this industry need before we become ready to consume advance tech.
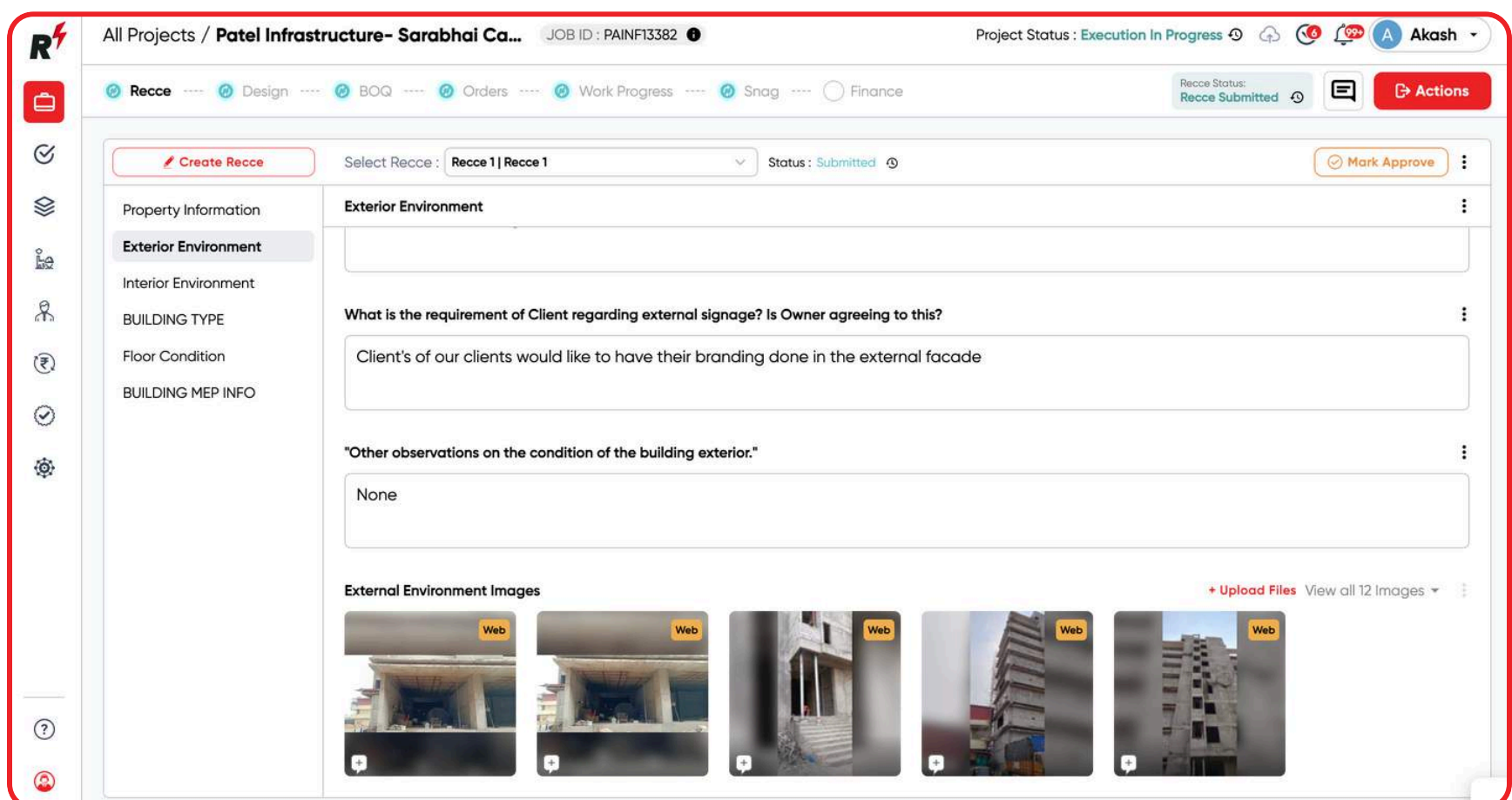
GOLDEN JOURNEY OF A PROJECT

Whether it is an office fit-out project or a ground-up construction of a hotel; following 7 steps exhaustively completes the entire life cycle of a project.
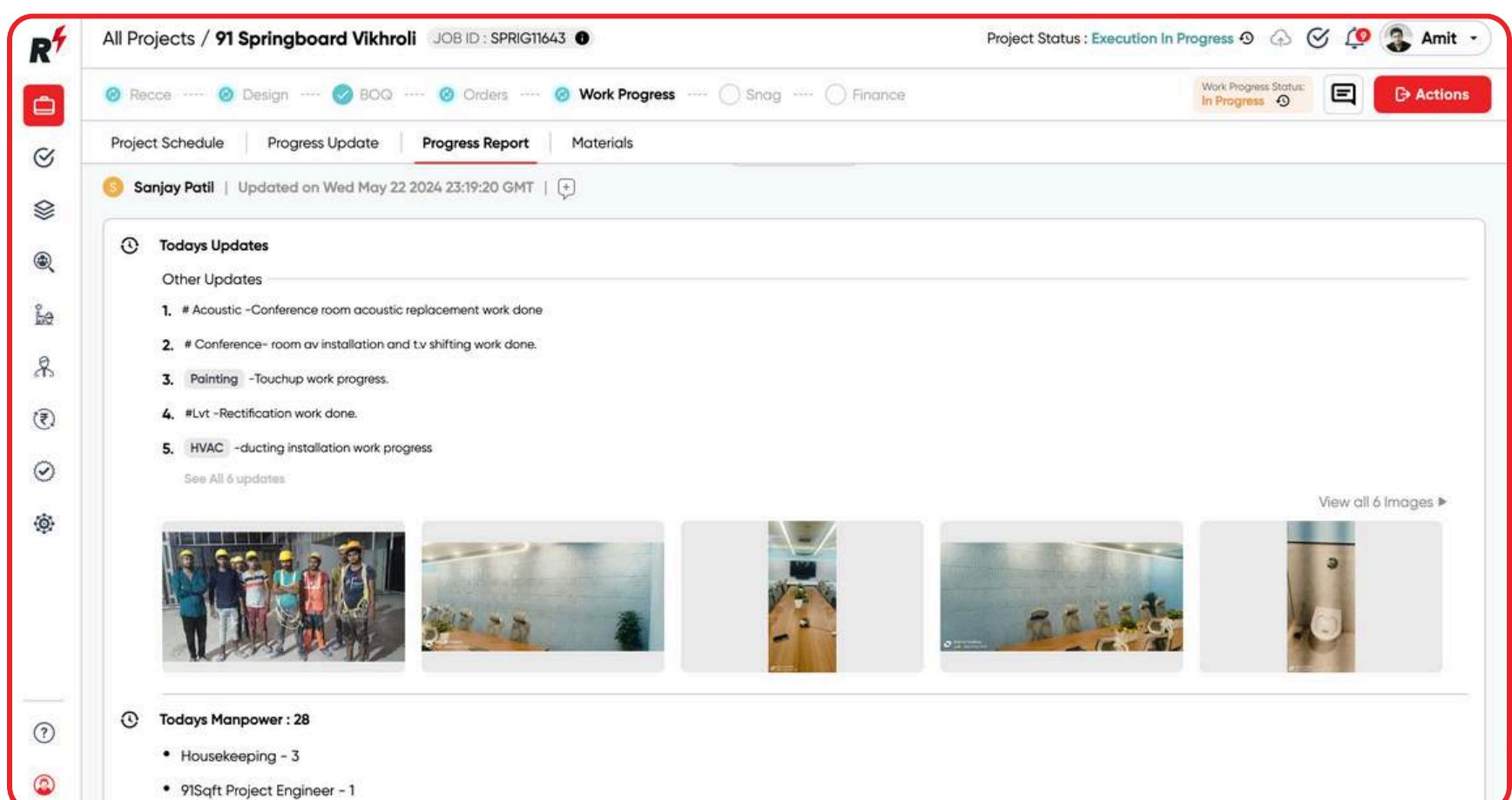
Understanding these seven steps will provide the necessary knowledge to communicate effectively with experienced individuals in the construction sector. In the following sections, I'll refer to RDash's screens to give a visual context of a construction project's workings. We will use an office fit-out project as an example.

STEP 01
RECCE

'Recce' short for 'reconnaissance', is an industry term which refers to a site survey. Before designing, an architect requires measurements of an area, capturing existing site conditions, structural components, and markers for inlets and outlets around AC, electrical, and plumbing services. However, project execution teams requires clarity on a broader range of subjects than just space measurements.

They need to know the material movement guidelines from the building's developer, material storage and handling areas, also understand the work shift timings, and the structural layout of the floor etc. Once these details are captured, this need to be organized into a report. This report becomes the first document for interacting with the client about their requirements.

Typical Pain Points: Often, the person conducting the recce doesn't have a complete list of necessary details to capture. This can result in multiple site visits and wasted time at the start of the project.

Remedy: Create a site survey checklist and reporting formats, assign specific personnel for recce, site survey trainings to the person going for recce etc.

STEP 02

DESIGN
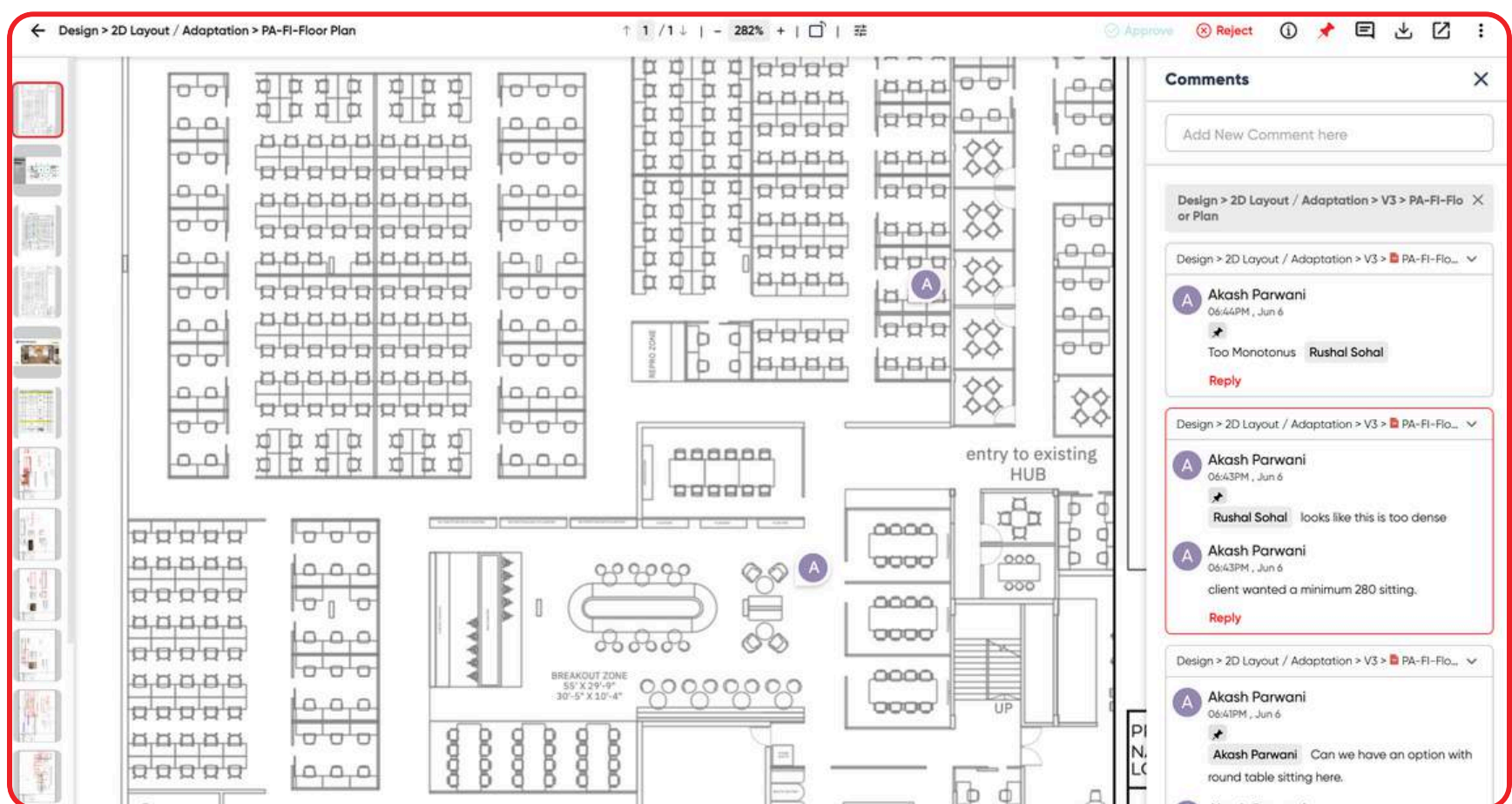
Design development typically utilizes software such as Autocad, Sketch-up, and Revit. The design process consists of two phases: Concept development and the creation of Good For Construction (GFC) drawings. From a project management perspective, challenges often arise during coordination around GFC drawings between the site team and the design team. Drawings serve as the primary mode of communication in projects.

Design softwares

When coordination occurs through emails and WhatsApp, it increases the risk of different project participants referring to varying design versions, possibly leading to contractors working off outdated designs.

Despite the availability of advanced tools like BIM, Plangrid, and RDash for managing drawing versions and collaboration, the construction industry in India still grapples with establishing these basic necessities. Poor design coordination is a significant cause of rework, material waste, and idle labor at sites.
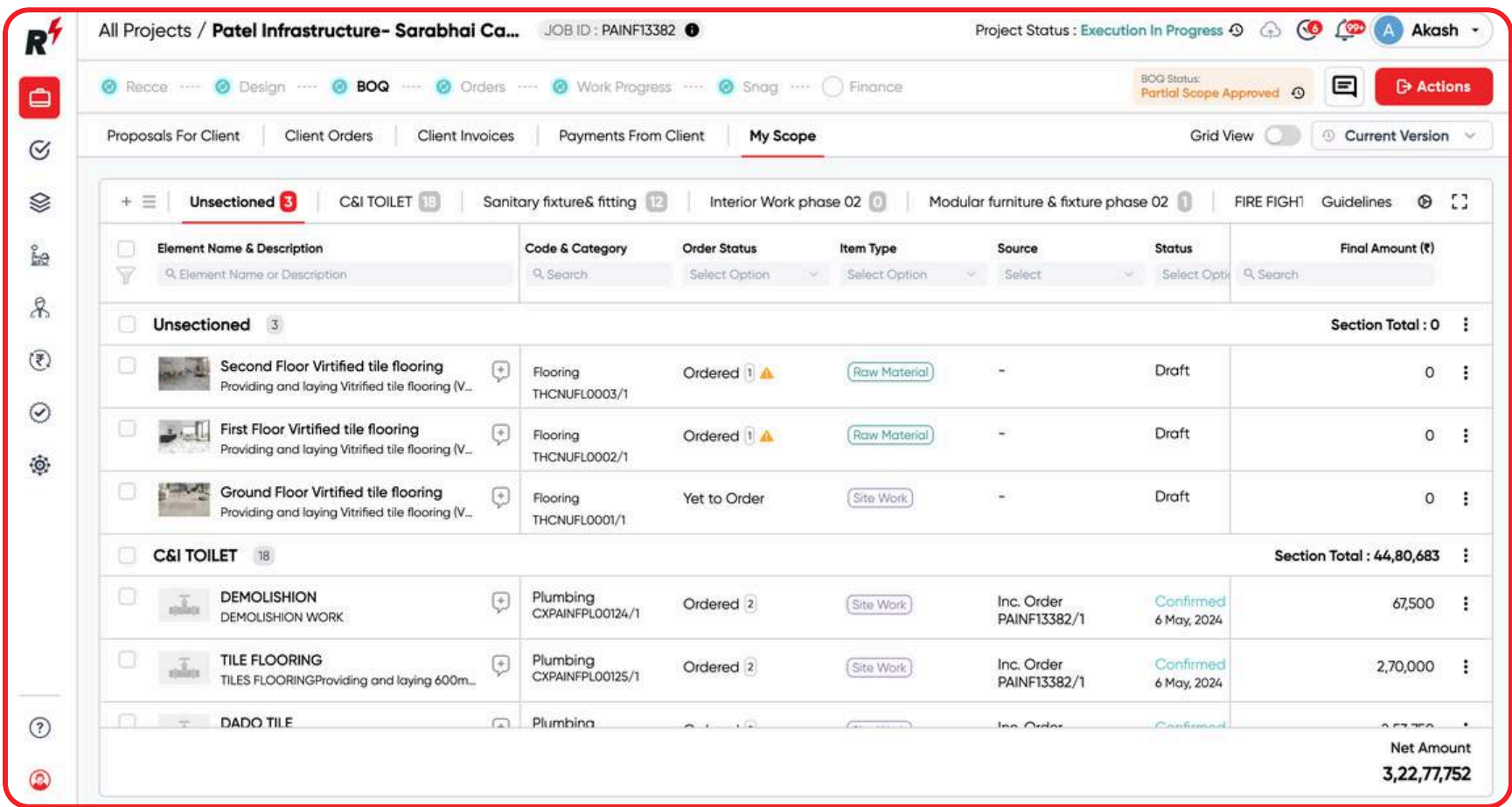
Typical Pain Points:
1. Mismanagement of design file versions, leading to confusion and waste.
2. The design process extending beyond the execution start date, which cuts into planning time and increases project coordination load.

Remedies:
1. Develop a site mobilization checklist to ensure the availability of necessary GFC files at the project's outset.
2. Implement a design management system for:
    a. Tracking design files, their versions, and approvals
    b. Coordinating with designers and clients during the execution phase.

STEP 03

BOQ (BILL OF QUANTITIES)

A Bill of Quantities (BOQ) is a term used to define the scope of a project. It typically

includes item names, descriptions, quantities, rates, and costs for each item. BOQ line items are usually grouped into sections such as Civil (Flooring, Partition, Glass, etc.), MEP (AC, HVAC, plumbing, etc.), loose furniture, white goods, and more.

Quantity surveying teams, also known as QS teams, create a BOQ by studying GFC drawings to quantify every cost item. However, it is impossible to create a perfect BOQ at the start of a project due to potential human errors, design changes proposed by clients during execution, or unexpected site conditions. Therefore, a responsible project manager's primary duty is to continuously update the BOQ and document changes with clients to prevent revenue leakage at the project's conclusion.

Typical Pain Points:
1. Revenue leakages, which can amount to 2% of the project value, occur when a PM fails to document changes in scope with the client in a timely manner.

2. An incomplete description of a scope element can lead to deviations in the quality of work executed on site.
3. Improper formatting of the BOQ increases the likelihood of human error.
4. Without proper item-wise margin analysis, the Project Manager might pay more to the contractor than what is charged to the client.
5. Project delays can occur when there's a lack of coordination between procurement and project management teams, leading to critical long lead items from the BOQ being unidentified and not procured on time.

Remedies:
1. Maintain status against each BOQ line item to track what has been approved by the client and what is still pending.
2. Create a predefined catalogue of items, known as an element library, to use when creating a BOQ. This will allow for better control over item descriptions.
3. Develop a standard template for creating project BOQs that is to be followed across the company.

4. Maintain a procurement tracker against BOQ line items with their procurement status and cost.

ORDER
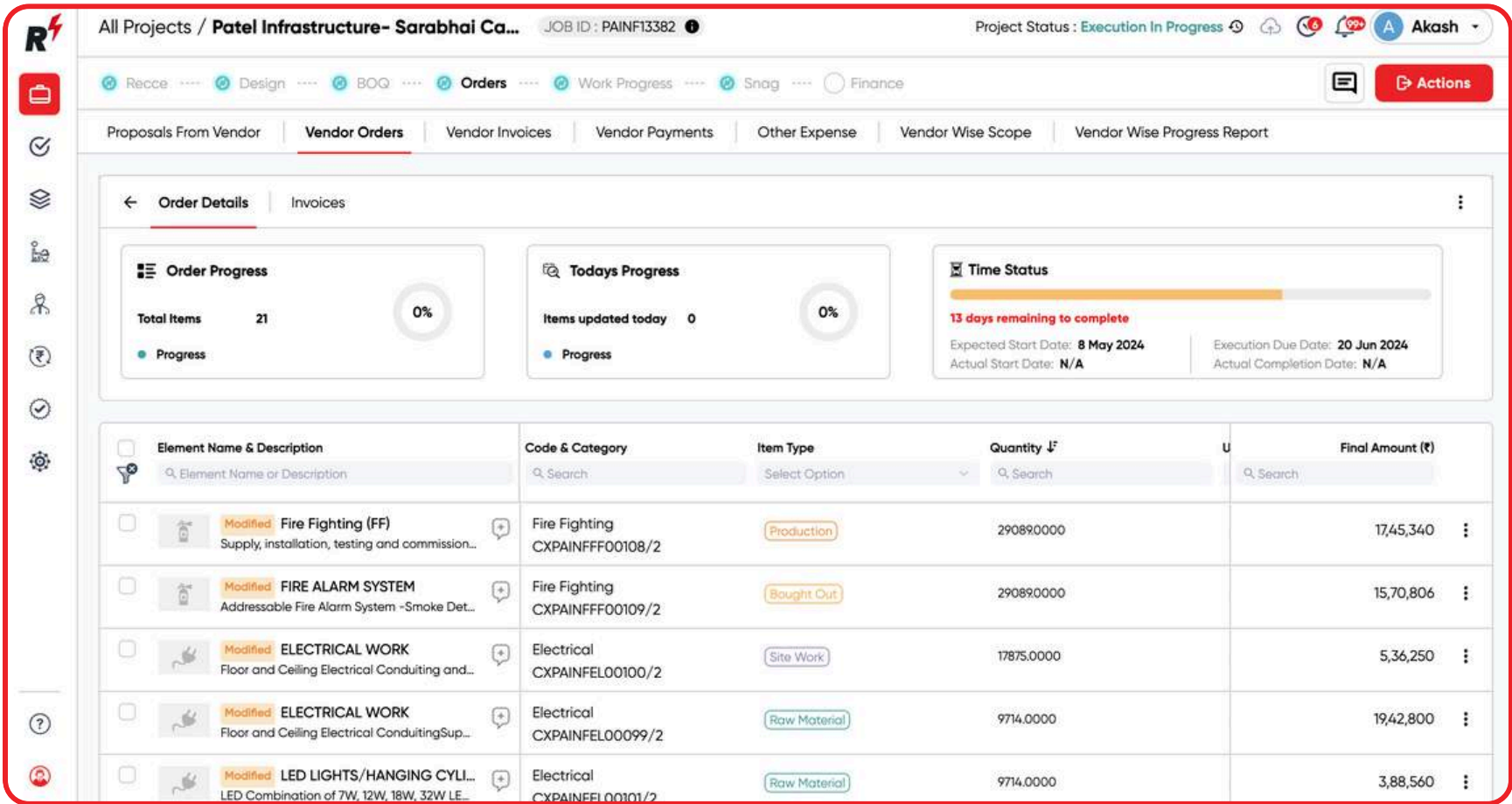
In a typical office project, the project scope is usually divided among 3-4 major vendors (civil-interior, MEP, loose furniture) and several smaller vendors for specialty items like carpets and metal fabrications etc.

The procurement team typically runs the RFP (Request for Proposal) process with vendors specific to each category, negotiates, and releases orders. If the orders are not released on time according to the project execution plan, it can cause project delays. There may also be long lead items, such as custom furniture and workstations, which are made-to-order. The project manager must consistently urge procurement teams to place timely orders for these items.

The scope of the order can change based on design iterations and site conditions, requiring a precise degree of reconciliation during vendor invoice processing. The project manager must validate changes in the originally proposed quantities while ensuring that extra cost items suggested by the vendor are also billed to the client as well.

Typical Pain Points:
1. Without a maker-checker system for orders, the project may experience cost overruns.
2. Lack of visibility between procurement and project teams can lead to project delays.

3. Reconciliation requires tremendous efforts and prone to human error when checking supplier invoices against order quantities and passing those on to the client as a claim for additional work.

Remedies:
1. Establish an approval hierarchy to accept an invoice and release an order. Reviewing results in increased accountability!
2. Keep an element code for each BOQ and order line item to automate reconciliation to a great extent. Creating a procurement rate master similar to the BOQ library is also beneficial.
3. Maintain a procurement tracker, especially for long lead items, to help the project manager and procurement teams stay synchronized.

STEP 05

WORK PROGRESS
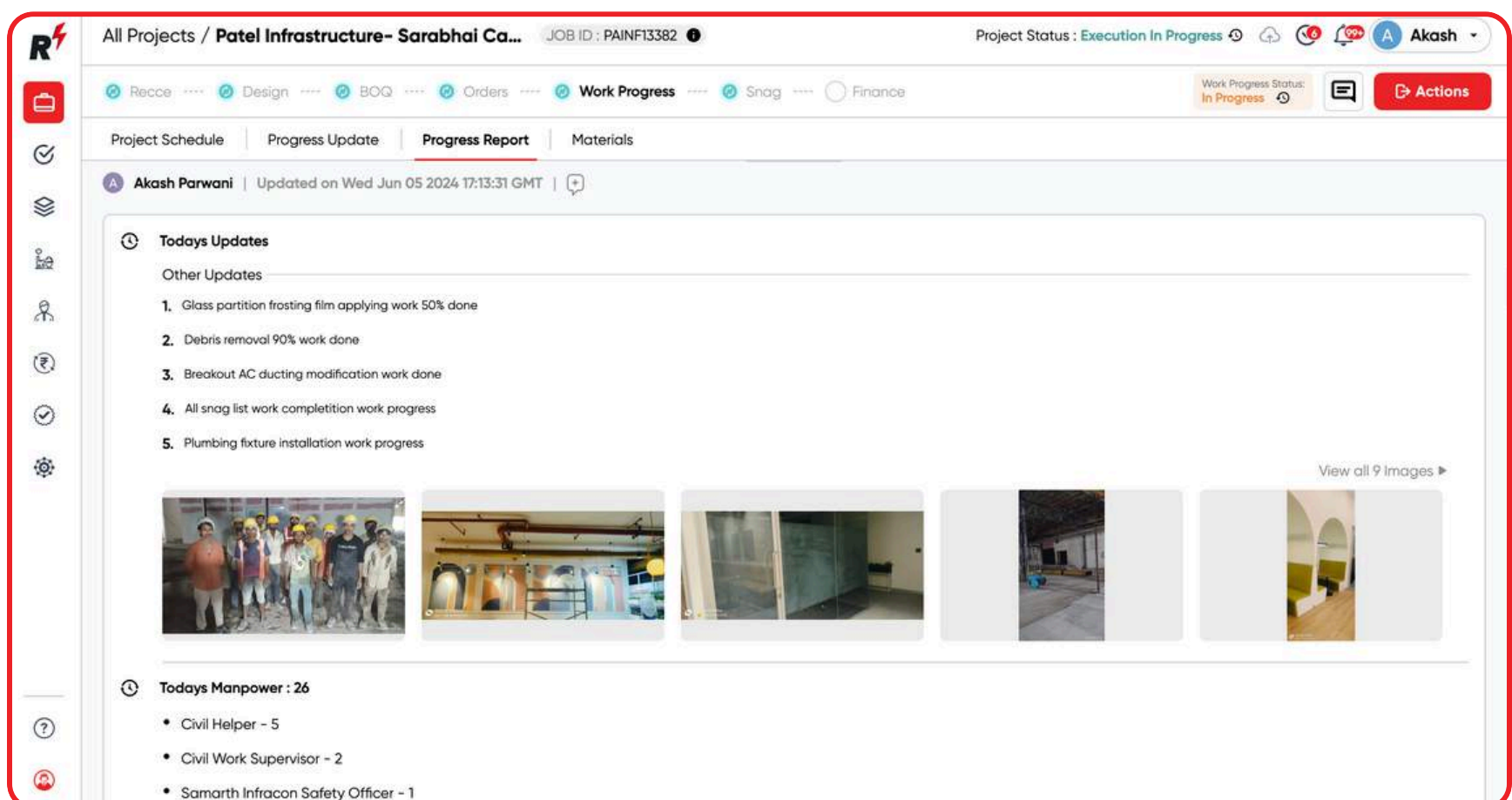
When we started 91Squarefeet, the first problem we encountered as we grew to 10 projects running in parallel was that we didn't know what was going on at our site. There is a widely adopted practice in the industry called DPR - Daily Progress Report, a report from the site published to all project stakeholders. Getting DPRs with visual proofs demystifies the site operations for the management and creates a culture of accountability in the site team.

Key building blocks of this report are:
- Site photographs and video
- Installed work progress (on BOQ line items)
- Manpower count - Better if divided as per specialization
- Blockers
- Tomorrow's plan
- Projected end date
- Project's percentage completion

Typical Pain Points:
1. Site operations remain a black box for management as project managers often do not want to fill DPRs as they believe value lies in getting the job done, not in filing reports. The client would escalate about lack of progress while the site team will keep on reassuring that things are going right. This disconnect between client and site teams leads to significant wastage of leadership bandwidth.
2. Invoicing of projects is also generally tied to percentage completion. In the absence of daily tracking of progress on BOQ level, this often leads to delay in invoicing and creates cash flow risk in the project.

3. Site teams often face challenges which are out of their control and need support from management, client, or external stake-holders like landlords and more often than not, they are blamed for failing to raise these concerns timely.

4. In the absence of quality reporting, critical issues come to light when it is too late.

Remedies:

1. Create a DPR template along with a way to track when DPR is not submitted. Draw patterns like:

   a. Daily reported percentage against dates - If your progress curve is following an S pattern, it means the project is largely going fine. If this curve has flat lines and steep jumps, it means either planning or accountability in the PM is broken. In any case, a bad pattern in project progress curve is an early indicator of poor project delivery.

   b. Projected End Date against dates - If there are no deviations in the projected end date, this graph will remain flat.

Eventually, there are some steps in this line graph but the number of steps and frequency of these steps matter. If there are more than 3 steps in the projected end date, it means multiple false commitments of delivery date have been made and customer experience has gone for a toss.

Daily reported percentage
against dates
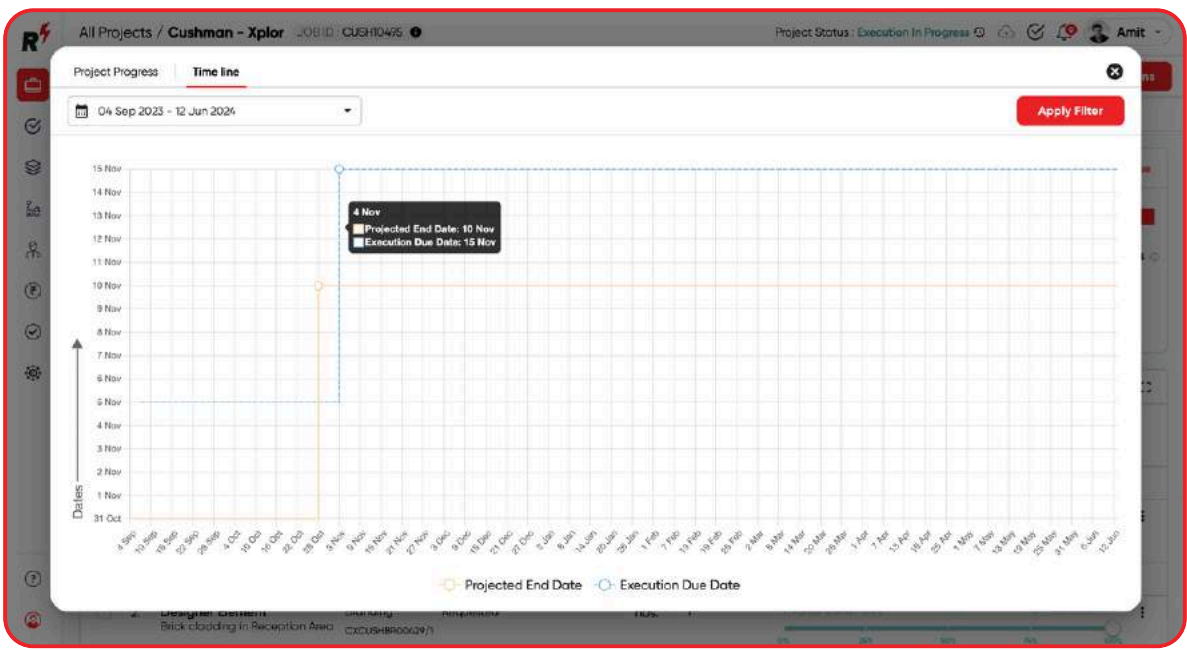
Projected End Date
against dates

2. Build systems to send invoice raising alerts when site progress hits payment milestones Do not leave it only on project managers. Management control on this is a must-have for any D&B company.

    a. Conduct 50% and 85% milestone completion reviews concerning Drawing, BOQ, Order, and Progress Update. Key items to review are: Pending drawings, unapproved scope items, long lead item procurement, sampling list and approval status, plan for remaining work, Manpower tracking through DPRs.

STEP 06

SNAGS/AUDITS
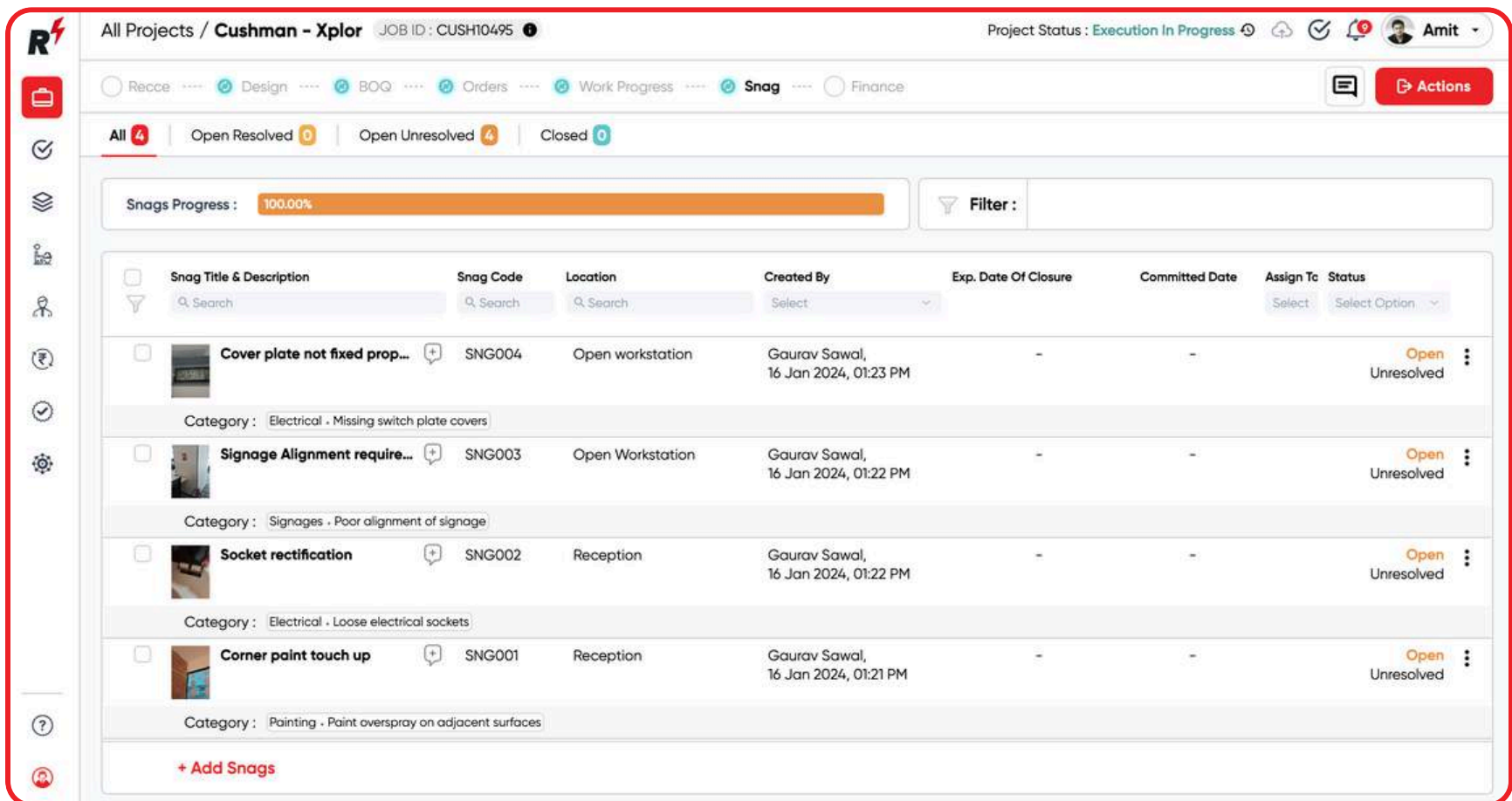
The standard protocol for project handover consists of two stages:

1. Date of Practical Handover - This is when all critical work is completed, though there may be finishing gaps and touch-up requirements in a few places. At this stage, the customer should be invited for a space inspection. Since labor is still on-site, it's important to gather final feedback about what's non-negotiable for customers before they take over the project.

This is typically when the final invoices to the client are raised.

2. Date of Final Handover - This is when the site is snag-free and the customer has occupied the premises. The Defect Liability Period (DLP) starts at this point. The standard DLP is one year, during which the Design and Build (D&B) firm needs to correct minor snags resulting from space usage. Final invoices are generally settled after date of final handover.

Because customer involvement is at it's peak from the practical handover to the final handover, how snags are recorded, addressed, and reported can affect reputation and repeat business from that customer. It is advisable to maintain snag lists with statuses and maintain constant coordination with the client during this period to ensure confidence.

STEP 07
FINANCE

You may be surprised to learn that 95% of contractors do not know what percentage of gross margins they are truly making on their projects. This is a problem we also grappled with within the first 12 months of starting 91Squarefeet. Let's take a moment to imagine what's going on in a project. You negotiated a rate assuming certain costs and noted down an expected margin on a project.

During the execution of the project, there are changes in the scope itself, material prices change a bit, travel and lodging expenses of site teams and leadership remain unaccounted for in project costs, the site PM purchases some materials or settles labor in cash to deal with last-minute exigencies, some material gets wasted, labor remains idle for a few days, human errors lead to rework, you are incurring the cost of working capital, and so on.

Reconciling project expenditures and revenue is a significant task in itself where you need to lock the architect, PM, supervisor, procurement and the client account manager, in one room for a couple of days post project completion in order to have precise reconciliation of project P&L. Obviously, this never happens, and reconciliation drags on for months. This creates an inherent risk in the entire system, especially if you are planning on scaling at a rapid pace.

Typical Pain Points:

1. Cash flow control on projects is not put in place by most companies. You can't always tie your payments as back-to-back payouts to vendors when you receive money from the client. In order to gain efficiency, you need to break the project into multiple suppliers, many of whom would have executed their complete scope before you hit the first payment milestone with your customer.

2. In the absence of a proper system around handling reimbursements and project expense limits, you lose agility around solving small blockers and exigencies. On one side, it creates unpredictability for the site team around the lengths they could go to solve the blockers, on the other hand, poor handling of these issues breaks client relationships.

3. Executive travel to the site is generally not tied to the project and accounted for as an admin expense. This creates a distorted picture around the margins you are actually making.

4. Poor reconciliation creates dark spots in the system, leaving ground for cost overrns and breeds malpractices and corruption. Also, settling vendors in an uncontrolled manner creates a cash flow risk on the business as well.

Remedies:

1. Assign every project a code, say JOB ID. Create a project wallet where you decide at the start of the project how much cash flow you are going to invest in the project as per the client's and suppliers' payment terms. If that cash flow wallet is breached, stop making further payments, and escalate to the client.

2. Create a finance controller bandwidth and approval mechanism around project reimbursements. Do it in weekly cycles if possible.

3. Tag all site-specific expenses to the JOB ID. Don't leave room for an expense getting approved without a JOB ID.

4. Integrate ERP with the project management software.

PROJECT MANAGER TASK MASTER

Task	Description	Responsible	Status	Due Date	Note
Site Survey	Conduct site survey and collect all necessary details	Site Engineer	Pending	MM/DD/YYYY	Use a predefined checklist
Material Movement Guidelines	Capture guidelines from building's developer	Site Engineer	Pending	MM/DD/YYYY	Coordinate with developer
Finalize Concept Design	Complete concept design & get client approval	Architect	Pending	MM/DD/YYYY	Use design management software
GFC Drawings	Develop Good For Construction (GFC) drawings	Architect	Pending	MM/DD/YYYY	Ensure all versions are tracked
Create Initial BOQ	Develop initial BOQ based on GFC drawings	QS Team	Pending	MM/DD/YYYY	Use element library for consistency
Update BOQ	Continuously update BOQ with scope changes	Project Manager	Ongoing	MM/DD/YYYY	Regular client communication
Vendor Selection	Conduct RFP process and select vendors	Procure-ment Team	Pending	MM/DD/YYYY	Ensure timely order release
Place Orders	Place orders according to project plan	Procure-ment Team	Pending	MM/DD/YYYY	Track long lead items
Daily Progress Report	Submit DPR with visual proofs	Site Team	Daily	MM/DD/YYYY	Include blockers, manpower count, next steps
Track Progress	Monitor work pro-gress and update project status	Project Manager	Ongoing	MM/DD/YYYY	Use progress tracking tools
Practical Handover	Complete critical work & invite clie-nt for inspection	Site Team	Pending	MM/DD/YYYY	Gather final client feedback
Final Handover	Ensure site is snag-free and rea-dy for occupation	Site Team	Pending	MM/DD/YYYY	Start Defect Liability Period (DLP)
Create Project Wallet	Allocate budget and track project expenses	Finance Team	Pending	MM/DD/YYYY	Assign JOB ID
Expense Reconcilia-tion	Reconcile project expenses and revenue	PMs & Finance team	Ongoing	MM/DD/YYYY	Regular review meetings

NOTE FOR THE STUDENTS

As you step forward into the vast world of construction, you'll encounter professionals who have become accustomed to the industry's challenges. They have adapted and found ways to work around these problems. It's essential to learn from their experiences but also to bring your fresh perspective and open-mindedness to the table. This combination can help you unlock the potential of what is referred to as the 'golden journey' - seven key stages that encompass the life of a construction project: Recce, Design, BOQ, Order, Work Progress, Snags/ Audits, and Finance.

Each of these steps is interconnected, and success in one area often depends on success in the others. Understanding these steps, the associated pain points and remedies is crucial to successfully steering your professional career in Construction and Design-Build companies. This fundamental understanding of the construction process can set you apart as a Next Gen Project Professional.

ABOUT THE AUTHOR

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Amit Bansal is a first-generation serial entrepreneur, currently the co-founder and CEO of 91Squarefeet and RDash. He is a civil engineering graduate from NIT Kurukshetra, worked as a structural designer, and studied supply chain management at IIM Mumbai. He has earlier co-founded Quifers - A route planning software in logistics and Yoda App - A bite size learning platform.

He is a strong believer in the India story. Amit believes, in the next 5 decades, India is going to shine given a huge demographic dividend and massive growth tailwinds, especially for the real estate and Infra sector.