

Specification of business processes

1. Business goals of the organization

The property development company focuses on residential construction, aiming to improve both material management and the building process. The company plans to introduce a system that not only tracks material orders to ensure timely deliveries and reduce waste but also improves how construction projects are managed to avoid delays. This system will also allow the company to monitor frequently used suppliers, providing leverage during negotiations for better pricing and terms, further optimizing costs and boosting profitability. By combining efficient material management with streamlined project execution, the company ensures better control over operations and costs.

Measurable goals:

- **5% reduction in material costs comparing to previous year**
- **reduce project delays caused by material shortages by 20% within the next year**

The company considers the year successful if there is a consistent downward trend in both key metrics. Specifically, costs must decrease by at least 0.5% monthly, material costs are reduced compared to the previous year, and project delays due to material shortages are cut by at least 1% each month over the next year.

2. Business processes

Material ordering and managing

- a. A general description of the business process and a description of the performance metrics generated by this process, possible current analytical problems.

The material ordering process is as follows: the assigned employee uses a dedicated software system to assess the material needs for every project. This system shows current inventory stock and past order history. Once the materials required are identified, the employee places orders through the software, selecting different suppliers based on availability and price. When materials arrive at the warehouses, the software updates the inventory automatically. The employee then allocates materials to specific construction sites according to project schedules. This allocation is also managed in the software, which creates a delivery schedule to ensure timely transportation. As materials are sent from the warehouse to the construction sites, the system tracks each delivery, noting any discrepancies like missing or damaged items. Throughout the process, the software provides important data on costs, delays and supplier performance, helping the company negotiate better prices and optimize material use for future projects.

- b. Typical questions
 - How many orders are placed per month and for which materials?
 - Which suppliers have the highest on-time delivery rates?

- What are the average costs of materials from each supplier, and how can this data be used to negotiate better deals?
 - What materials are ordered most often, and what are the trends over time?
 - How do material costs fluctuate over time? Are there seasonal price changes?
 - Give the average monthly material cost for the last year.
 - How quickly are materials distributed from warehouses to construction sites after arrival?
 - Compare the number of materials ordered versus the number actually used on-site.
- c. Data for the data warehouse comes from two main sources. **Both are databases.** First, the **material ordering system**, which tracks all key information such as project details, supplier data, material quantities, order and delivery dates, costs, and discrepancies between ordered and delivered items. This provides insight into procurement efficiency and supplier performance.

Second, the **inventory management system**, where stock levels in warehouses, material allocations to projects, and delivery schedules are recorded. This ensures that materials are properly tracked from warehouse to construction site, helping prevent shortages and delays. Together, these two sources provide a complete view of material flow and usage for analysis and optimization.

Building process

- a. A general description of the business process and performance metrics generated by this process, along with possible current analytical problems.

The building process begins once materials are delivered to the construction sites. The assigned construction manager uses a dedicated software system to oversee project progress, track labor deployment, and manage schedules. The system tracks milestones for each project phase, ensuring that all tasks are completed on time and within budget. The construction manager coordinates teams and ensures that resources, such as labor and materials, are appropriately allocated. The software also monitors construction delays, logs issues encountered, and tracks rework or material wastage due to construction errors. During the entire process, data on project status, resource allocation, and any issues are recorded, offering a clear view of performance against the planned schedule and budget. These insights help identify bottlenecks, reduce downtime, and optimize project workflows.

- b. Typical questions:
- What is the current status of each construction project?
 - How much labor is being used per project phase?
 - Which projects have the highest rate of rework or material loss?
 - Compare actual labor hours used to planned hours for each task.
 - What are the most common causes of construction delays?
 - Which teams are the most productive in terms of completing tasks on time?
- c. Data for the building process comes from two main sources. Also **both are databases.** First, the **construction management system**, which tracks project timelines, labor, and any delays or issues. Second, the **on-site tracking system**, which records daily progress, labor hours, and equipment use. Together, these sources provide real-time insights into project progress and efficiency.