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Integrated production applied to building rehabilitation in the São Paulo historic center

Produção integrada aplicada a reabilitação de edifícios no centro histórico de São Paulo

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Revista de Arquitetura IMED, Passo Fundo, vol. 14, n. 1, p. 1-26, janeiro-junho, 2025 - ISSN 2318-1109

DOI: https://doi.org/10.18256/2318-1109.2025.v14i1.4996

Sistema de Avaliação: *Double Blind Review*

Abstract

The particularities of building rehabilitation projects evidence the limitations of conventional production management approaches. The aim of this work is to analyze the process of building rehabilitation from an integrated production view. The approach is based on collaborative work and early participation of all agents to improve efficiency of the process and quality of the building. Interviews were conducted with two professionals that work with rehabilitation and also the assessment of the production process of a rehabilitated building in São Paulo, Brazil. It is argued that the adoption of measures aimed at eliminating the linearity of production phases optimizes the process, especially in cases of rehabilitation, due to their particularities in relation to new projects.

Keywords: Collaborative work; Early participation; Production process.

Resumo

As particularidades de projetos de reabilitação de edifícios evidenciam as limitações da gestão convencional da produção. O objetivo deste trabalho é analisar o processo de reabilitação de edifícios do ponto de vista da produção integrada. A abordagem tem por bases o trabalho colaborativo e a participação precoce dos principais agentes e visa aumentar a eficiência do processo e a qualidade do edifício. Entrevistas foram conduzidas com dois profissionais que trabalham em projetos de reabilitação e também o estudo do processo de produção de um edifício reabilitado em São Paulo, Brasil. Argumenta-se que a adoção de medidas visando eliminar a linearidade das etapas da produção otimiza o processo, especialmente nos casos de reabilitação, dado as suas particularidades em relação a novos projetos.

Palavras-chave: Trabalho colaborativo; Participação precoce; Processo de produção.

1 Introduction

Brazil has a growing market for rehabilitating buildings, especially in large city centers. According to an assessment by its municipality, São Paulo had more than two million square meters of unused or underused built space and vacant lots (Pereira, 2016). As set in the city's 2014 Master Plan, the Urban Intervention Project (PIU) was established through a municipal decree in 2016. Among its actions is the compulsory acquisition of vacant land or buildings that are unused or underused for social housing and public services (São Paulo, 2016).

These new instruments – legal and urbanistic – of public management have the potential to foster the recovery and rehabilitation of buildings, with interventions by the Prefecture or via public partnerships. In these cases, it's worth reflecting upon the rehabilitation process and identifying its main challenges. This work sought to analyze the production process of rehabilitation projects, from an integrated point of view.

2 Building Rehabilitation

Rehabilitation can be of a single building, as well as of urban restructuring of the neighborhood it's inserted.

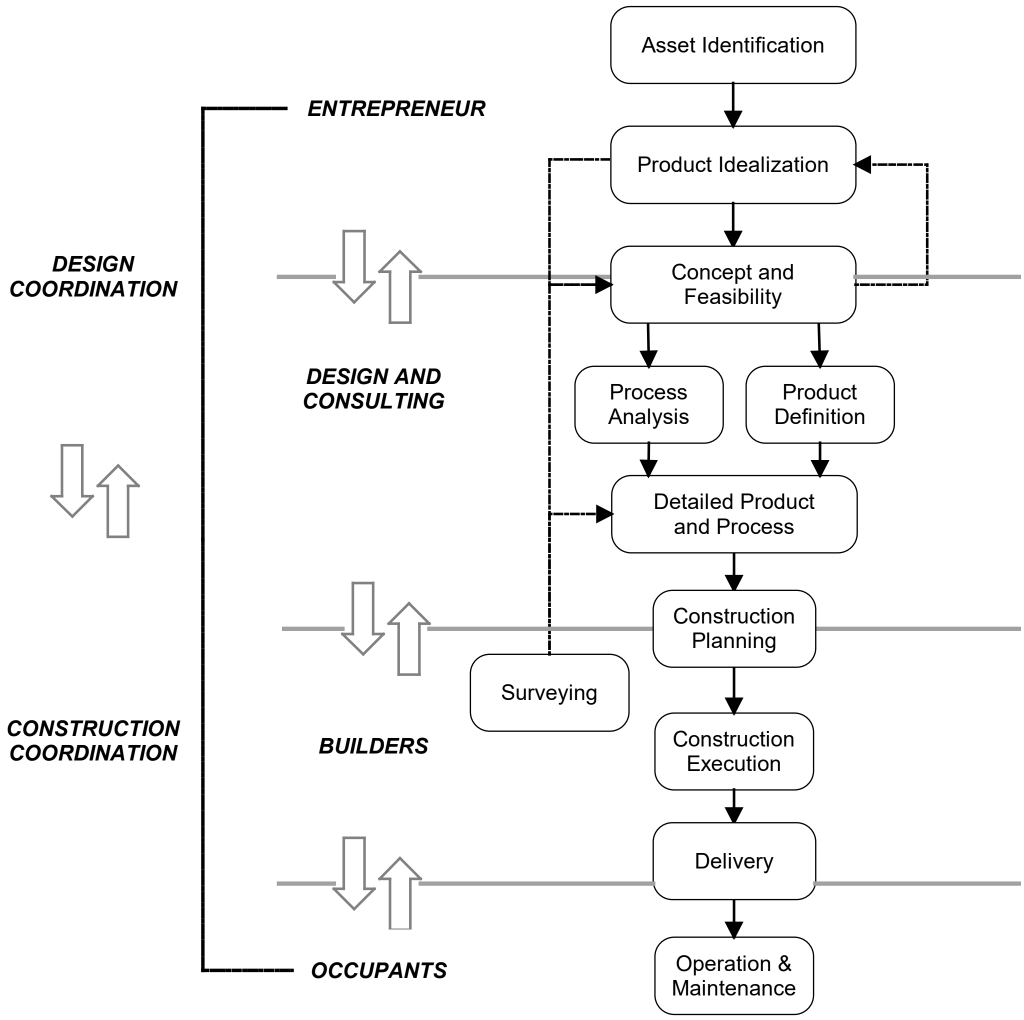
At the single building level, Appleton (2003) defines rehabilitation as the set of operations destined to enhance the levels of quality of a building, in conformance with levels of functional requirements that are higher than those for which the building was conceived.

At the urban scale, the Projeto Reabilita (2007), an initiative aimed at social housing projects, defines rehabilitation as a process through which the building or urbanistic asset can be recovered to contribute not only to its owners or tenants, but also in a more ample scale, as an intervening process in a whole urban area.

In the case of buildings, Croitor (2008) defines four potential groups: aged and degraded buildings; unfinished and abandoned buildings; buildings with inefficient utility installations; and buildings that can be converted to other uses.

Croitor (2008) assesses the particularities of building rehabilitation production process, identifies the limitations conventional approaches, and proposes management guidelines for such projects. According to Croitor, working with an existing Building, the design-construction interface becomes the most critical stage in the process. Figure 1 presents Croitor's proposed production process for rehabilitation projects.

Figure 1. Croitor's rehabilitation production process



Source: Adapted from Croitor (2008, p. 58).

Designers working on rehabilitation projects must consider the physical limitations imposed by the architectural part of the original building. It is not unusual that problems and intervention needs emerge that were not identified in the initial surveying.

3 Integrated Production Process

During the production of a building, it is necessary to coordinate several activities, in varying maturity levels and involving professionals of different specialties (Melhado, 2001). Fabrício (2002) identifies problems and difficulties in the linear execution of the design stages. With each new activity, new information is added and existing plans are updated with increased detailing. As a consequence, the overall design becomes fragmented and subject to inconsistencies.

Practitioners, academics, and associations (Fabrício, 2002; Matthews; Howell, 2005; American Institute of Architects, 2007; Eastman *et al.*, 2011; El Asmar; Hanna;

Loh, 2015) have turned attention towards integrated production. Recently, the so-called Integrated Project Delivery (IPD), stands out as a means to pursue effective and efficient production in the construction industry.

The American Institute of Architects (2007, opposite the Title Page) defines IPD as,

> a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste and maximize efficiency through all phases of design, fabrication and construction.

The American Institute of Architects (2014, p. 4) reviews the earlier definition indicating that IPD is a "project delivery method", adding that it must contain, at least, the following elements:

- Continuous involvement of owner and key designers and builders from early design through project completion
- Business interests aligned through shared risk/reward, including financial gain at risk that is dependent upon project outcomes
- Joint project control by owner and key designers and builders
- A multi-party agreement or equal interlocking agreements
- Limited liability among owner and key designers and builders

Conventional construction projects are typically fragmented, and characterized by a lack of collaboration, low productivity and low quality of construction (American Institute of Architects, 2007, 2014; Eastman *et al.*, 2011; Lahdenperä, 2012; El Asmar; Hanna; Loh, 2015). These conventional approaches are typically governed by transactional contracts.

Eastman *et al.* (2011) state that there are three main transactional contract models used in the construction sector: Design-Bid-Build (DBB), a fragmented delivery method, where each participant enters the process only in the phase of his responsibility; Design and Build (DB), that establishes an association between the designer and the contractor; and Construction Management at Risk (CMAR), with the early participation of the contractor, that is also the general manager.

Integrated and collaborative work is better established upon a relational contracting type, e.g., Early Contractor Involvement - ECI (Scheepbouwer; Humphries, 2011), Project Partnering – PP or Project Aliance - PA (Lahdenperä, 2012), not based on the exchange of goods and services, but on rules of cooperation among parties. Risks and benefits of the process are the responsibility of the team as a whole, to incentivize cooperation among agents and the search for innovative solutions to meet a client's objectives, considering costs, schedules and quality (Matthews; Howell, 2005).

4 Method

The research method is descriptive in its objectives in that it analyses typical local rehabilitation production processes against proposals from an integrated production perspective. The research is applied in nature, as it aims to create knowledge for the improvement of the production process in this niche within the construction industry, through a qualitative approach, based on selected literature on the subject. In consonance with the proposed method, the procedures to realize the objective, are described as follows.

An assessment of the typical practice in the city of São Paulo historic center was carried, by Oliveira *et al.* (2016), beginning with interviews with two active professionals. One is a joint owner of a real estate developer, exclusively in rehabilitation projects. The other is an engineer with prior experience in rehabilitation projects, afterwards a consultant in this sector.

Through the interviews it was possible to identify two kinds of production processes, here designated as Process 1 and Process 2. These are further detailed in the next section of this article. Also, a case study was conducted of an actual rehabilitation project, in the area. Data from the production process of the Laura Cristina condominium was provided by the real estate developer partner cited earlier, and the buildings' resident manager, during guided tours.

A comparison between Processes 1 and 2, and a proposal considering an integrated production approach was done. Such comparison considered the production stages, the agents, the contracting types, and the instants of the main design and execution decisions, and made use of the notation based on Croitor's diagram, presented in Figure 1. This work presents a review, in which another form of notation is presented, for better understanding of each process.

The reviewed comparison uses the established standard Business Process Model Notation BPMN (OMG, 1997), for agents' activities and interactions, within each phase of production; and, also borrows from a diagram created by the American Institute of Architects (2007), for a summarization of a production process' phases and indication of participation of each agent in each phase.

BPMN was developed as a standard language for capturing business processes, especially at the level of domain analysis and high-level system design (Chinosi; Trombetta, 2012). It was developed to help businesses understand their internal processes so that decision makers see their processes without focusing on how a particular solution constrains the problem domain (Flowers; Edeki, 2013).

BPMN diagrams have four categories of graphic elements: flow objects, connection objects, swim lanes, and artifacts. Flow objects include activities and gateways. Activity is an atomic unit of action, performed by an entity, in BPMN. Gateway is a node for

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arcs leading to alternative actions, based on some condition or decision. Actions and gateways are similar to process boxes and decision rhombuses (diamonds) in traditional flowchart diagrams. A swim lane contains the sequence of actions regarding an entity in the process (Flowers; Edeki, 2013). An entity can be a single agent or some division within an organization, represented as a pool (of swim lanes).

Connection elements consist of lines (directed arcs) of the following types: sequence flow (connects elements within the same swim lane), message flow (connects elements from different lanes), and association (to clarify inputs and outputs). Artifacts are elements that help group or annotate the model, thus providing a better understanding of the process. Examples of annotation artifacts are comments and data objects, such as business documents and letters, and e-mails.

BPMN diagrams can have increasing levels of definition complexity, from Descriptive (Level 1) to Analytical (Level 2) up to Executable (Level 3). Level 1 shows how entities collaborate in the process. In Level 2, activities are broken down for a more precise description of the inner workings, and other elements are added for its support. Level 3 consists of the integration of Level 2 diagrams with elements of computer languages, e.g. XML, to enable the model to be machine-readable, i.e., translatable into software code (Flowers; Edeki, 2013), e.g., for automation purposes, or process performance assessments.

The objective of such notation use is to clearly indicate when each agent enters and leaves the process, agent participation through communication, and when an activity is performed in isolation or in collaboration among agents.

5 Typical Rehabilitation Production Processes in the São Paulo Historic Center

All information on this and the next Section was provided by professionals involved in rehabilitation projects, planning, management, and/or execution. One is a Civil Engineer involved in building rehabilitation with more than five years in the field, at the time of the interview. The other is a partner of a building company exclusively involved in rehabilitation projects.

Rehabilitation projects typically follow some common production stages: asset identification, preliminary surveying, product definition and economic feasibility, acquisition, detailed surveying, detailed design, execution, and delivery. The main agents' roles considered are: the client; the developer; the builders (companies/professionals); and the design team. In many cases agents accumulate roles.

Process 1: a building company, as a developer, manages the production, on its own, or as a result of a client demand. In either case, the building company has at least an architect or engineer to coordinate their projects and an administrative and legal

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department responsible for contracts, project documentation, and sales of the finished apartment units. Design is outsourced.

Process 2: a client or a developer seeks a builder for the production. The builder has a project coordinator, administrative and legal departments, and also a design team.

Table 1 summarizes the agents' roles for each case, identified as Process 1-a, when the client is in itself the developer-builder; Process 1-b, when the client seeks a developer-builder; and Process 2, when a client is a developer apart from the builder.

Table 1. Agents' roles for typical rehabilitation of buildings in the São Paulo historic center

<table>
<tr><th>Roles / Agents</th><th>Process 1-a</th><th>Process 1-b</th><th>Process 2</th></tr>
<tr><td>Client</td><td rowspan="3">Builder</td><td>Investor</td><td rowspan="2">Investor</td></tr>
<tr><td>Developer</td><td rowspan="2">Builder</td></tr>
<tr><td>Builder</td><td>Builder</td></tr>
<tr><td>Project Coordinator</td><td colspan="3">Builder's architect or engineer</td></tr>
<tr><td>Designer(s)</td><td colspan="2">Outsourced</td><td>Builder's team</td></tr>
</table>

Source: The authors

In Process 1, building identification is done either by the (a) developer/building company or (b) client(s) seeking this kind of opportunity. Whereas in Process 2, building identification is solely done by client(s), either as investors or developers.

After identification, the builder, in both processes, performs a preliminary survey to determine the built area, number of apartment units, current uses, and the conservation state of the building. Acquisition and construction work will only take place after a positive feasibility assessment.

In Process 2, product definition and feasibility assessment involve the client, the main contractor, and subcontractors. Each builder presents design guidance according to his specialty, while the client sets the project budget. Project feasibility is determined according to: the intended use, proposed by the client in common with the builder's design team; the degree of intervention required by the rehabilitation of the building, as defined by each specialty; and the schedule devised by the main builder, based on the client's budget.

There are differences between the processes in the product definition and feasibility assessment. In Process 1, this is done by (a) the developer-builder or (b) the client and the main builder, who define the requirements and architectural brief for the project.

Feasibility of a rehabilitation project varies. It can be due to reduced construction time and costs, as compared to a new construction, because the foundations and superstructure are already in place. Or to the quantity of (sellable) floor space, a result

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of more favorable setback distances and floor area ratio, than that would be permitted by current legislation for a new construction.

Detailed surveying that follows acquisition, begins with the assessment of the original building's approval plans, and any subsequent modification plans. Measurements are taken to validate and, if necessary, update such plans. This includes the assessment of the structural system, utilities ducts and passages, which may include creating voids in walls.

In Process 1 this surveying is done by architects and/or engineers, with the use of general measuring tools. In Process 2 the surveying process is divided among contractors according to specialty. Special tools to detect materials in walls may be used, thus reducing the need for openings.

The detailed design phase is outsourced in Process 1. The developer/builder selects a design office with known expertise in rehabilitation and provides the detailed survey results along with the requirements and architectural brief.

In Process 2, the design team within the main contractor is in charge of the detailed design process. Its staff is familiarized with the requirements and brief since they participated in the product definition and economic feasibility phase.

Regarding construction, in Process 1-a, the project is managed by a developer, who will employ subcontractors for the required building systems, such as walls, finishes, electrical, hydraulics, and restorations. When the project is managed by a builder, regardless of being Process 1-b or Process 2, it will be responsible for the general systems, such as walls, finishes, electrical and hydraulics, and will employ specialized services like restorations and HVAC systems.

Typically, this phase requires most of the designs' reviews. Many elements that are inside the walls are only to be discovered during execution, because of lack of detail in the original plans. Oftentimes, because the disposition of elements, even in the case of structural elements doesn't repeat itself, as would be expected, between floors. This design rework is usually faster in Process 2, because the design team is internal, not outsourced.

There is also the case of a particular developer that operates via Process 1-a, and relocates part of its office to one of the apartments within the building undergoing rehabilitation – staff involved, and equipment and documents used in the project, as soon as the intervention permits its occupation.

Table 2 exhibits responsibilities for the main production stages of typical rehabilitation projects in the São Paulo historic center.

Table 2. Production stage responsibility for typical rehabilitation of buildings in the São Paulo historic center

Production stage	Process 1-a	Process 1-b	Process 2
Asset identification	Builder	Client	
Preliminary Survey		Builder	
Product definition and Economic feasibility		Client + Builder	Client + Builder + consultants
Acquisition		Client	
Detailed Survey		Builder	Builder + subcontractors
Detailed design and Process definition	Design Office(s)		Builder's design team
Execution and Delivery	Builder + subcontractors		

Source: The authors.

6 Case Study: Laura Cristina Condominium

Prior to rehabilitation, the building presented deterioration, with graffiti on its facades, wood frames in a poor conservation state, insufficient electrical installation considering present uses, and the absence of fire protection equipment and plans.

The degree of intervention was low, because its original use, as residential, was maintained, and thus, most of its walls, internal and external, were preserved. Interventions were: replacement of the entire electrical, hydraulics, communication and gas systems, the opening of the kitchen walls and the installation of countertops, the addition of bathrooms by splitting the existing ones and the creation of a communal leisure area on the rooftop. Figure 2 shows the main facade, before and after the intervention.

Figure 2. Before (left) and after (right) rehabilitation

Credit: Staszewski, 2010.

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Several original elements were restored: the ground floor's marble facades, main gate, wooden venetian blinds (Figure 3 left), lobby chandeliers (Figure 3 right), granolithic floorings of the building entrance and apartment units' halls, apartments' wooden floorings, apartments' entrance door, and the elevators' doors and interiors.

Figure 3. Restored venetian blind (left) and lobby chandelier (right)

Source: Oliveira *et al.* (2016).

This was a Developer-builder type project (Process 1-a), whose participants were: the developer, who acquired the building and contracted the other parties, a design office and the specialized builders.

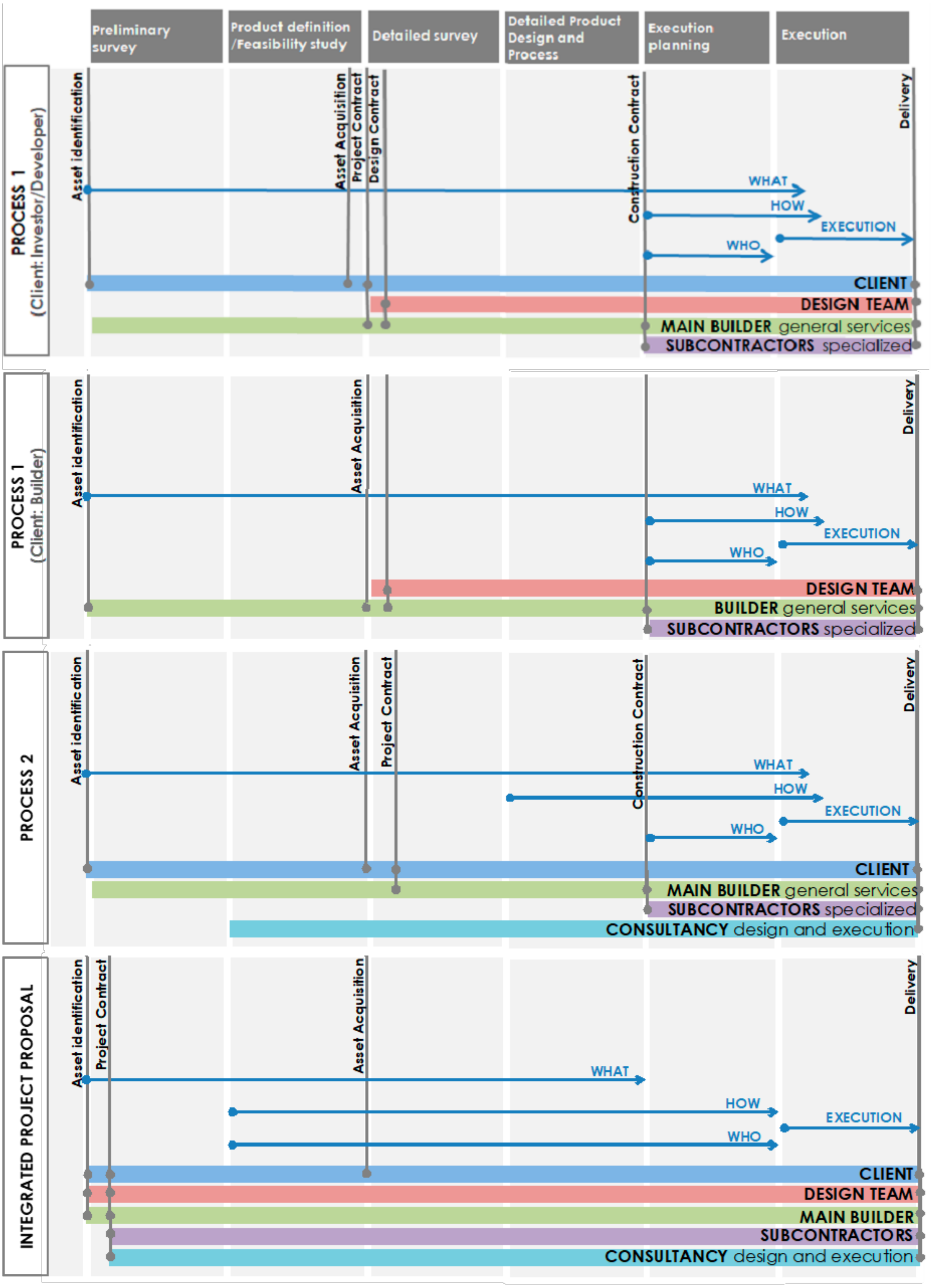
There were unpredicted events during the product definition and feasibility assessment phase, which impacted the schedule and budget initially set by the developer. The submitted plans included the subdivision of the existing apartment units to create more dwellings, but this was not approved by the municipality and the designs were redone considering the existing ones. This resulted in a 60-day delay in schedule.

Other problems occurred during construction and impacted final costs. An infiltration was discovered beneath the ground floor, due to upwelling of groundwater. The precarity of the catchment and the ground floor impermeabilization systems made it necessary to rebuild the drainage pipes, install a new water pump system and redo the impermeabilization, as well as the flooring.

Another unforeseen cost was due to the decision to restore the wooden venetian blinds. Although the Building isn't listed, the developer decided to preserve or restore many of its original characteristics. In many cases, the owners of the apartments had substituted the wooden blinds for PVC, because they were perceived as being too heavy or as not blocking sunlight entirely. A specialized company, from out of State, was called for such task, which cost twice what was expected, considering also these usability and performance requirements. Final costs exceeded the initial budget by 15%, the upper limit for contingencies set by this particular developer.

7 Comparisons and Proposal

Figure 4. Comparison of Process 1, Process 2 and Proposed Integrated Production



Source: Adapted from American Institute of Architects (2007, 2014).

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Figure 4 presents a synthesis of the comparison between Process 1, Process 2, and a Proposed Integrated Production approach, borrowing from the American Institute of Architects (2007, 2014) notation and terminology.

There are two diagrams for Process 1, depending on whether the client is an investor or its own builder. It is the one whose phases are most sequential in terms of engagement. Each agent participates only in the stages of their responsibility. The decisions regarding the execution (how to build) and what companies/professionals will participate in the construction (who will build) are made only in the construction stage.

Stages in Process 2 are less sequential, in terms of engagement. There is an approximation between the design and construction agents in the product definition and feasibility assessment stage. However, their early participation is as consultants, that may or may not participate in the actual design and construction.

Process 1 and 2 have different contracts among the agents of the process. The client and the main contractor establish a contract that determines the final construction, from what was acquired by the client. In Process 1 there is still a contract for the design stage, after the product definition between the client and the main contractor. In Process 2 the design team belongs to the main contractor and the design is part of the construction contract. Afterward, both in Process 1 and Process 2, the main contractor establishes building contracts with the subcontractors for their specialized services.

The diagrams presented in Figure 4 provide for an immediate comparison between the typical and proposed forms of process organization. In this manner, they hide the details of each rehabilitation production process type. For a detailed description, each typical rehabilitation process is presented, using the BPMN (OMG, 1997), respectively, in figures 5.1, 5.2, 6.1, 6.2, 7.1, and 7.2.

In the proposed integrated production approach, a team establishes a single contract for the whole extent of the project, and work in collaboration seeking the best design solutions. The early participation of all agents (who will build) anticipates the how to build decisions.

It is proposed in two forms, one for the case where the client is an investor that seeks a builder (figures 8.1 through 8.3) and the other where it is a building company on its own (figures 9.1 through 9.3). The first case relates to Process 1-b and Process 2, the second relates to Process 1-a. Design is considered separate from the building company in both forms, as shown by the individual pools in the BPMN diagrams. In the cases where the building company has its own design team, these pools can be merged as lanes in a single builder's pool.

Differences between the typical production processes for São Paulo historic center can be made, in detail, comparing figures 5.1, 6.1 and 7.1, also comparing figures 5.2, 6.2 and 7.2.

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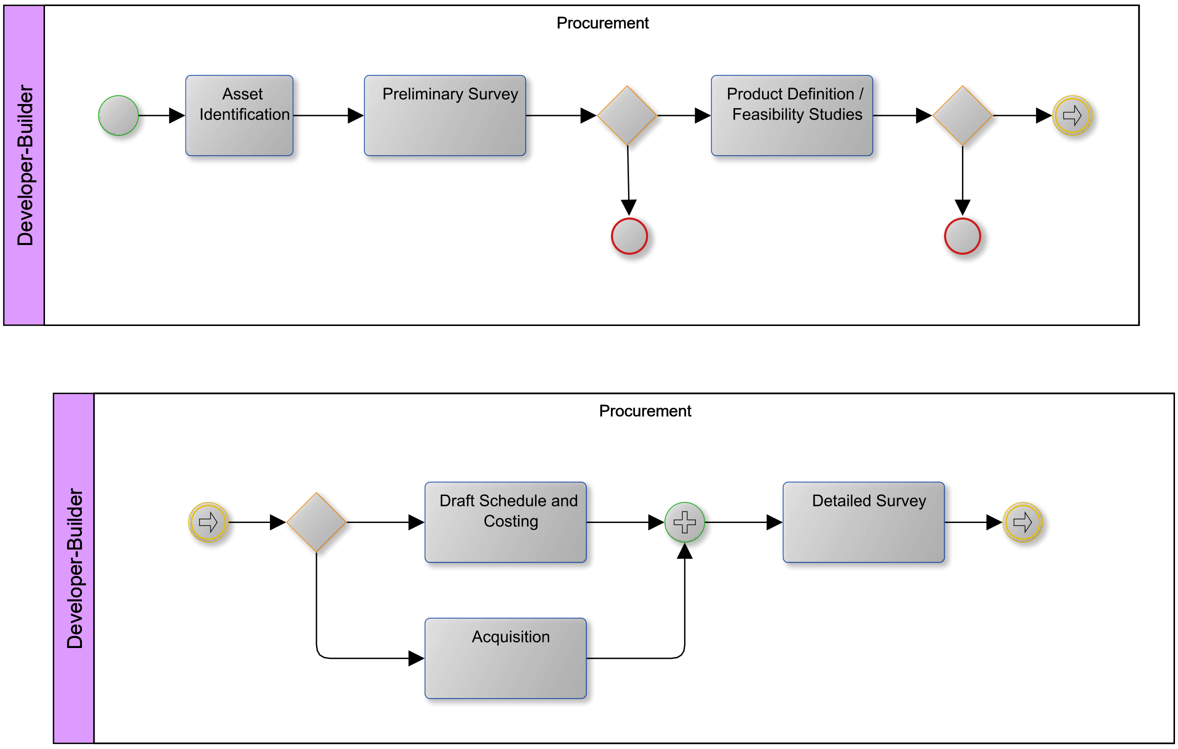
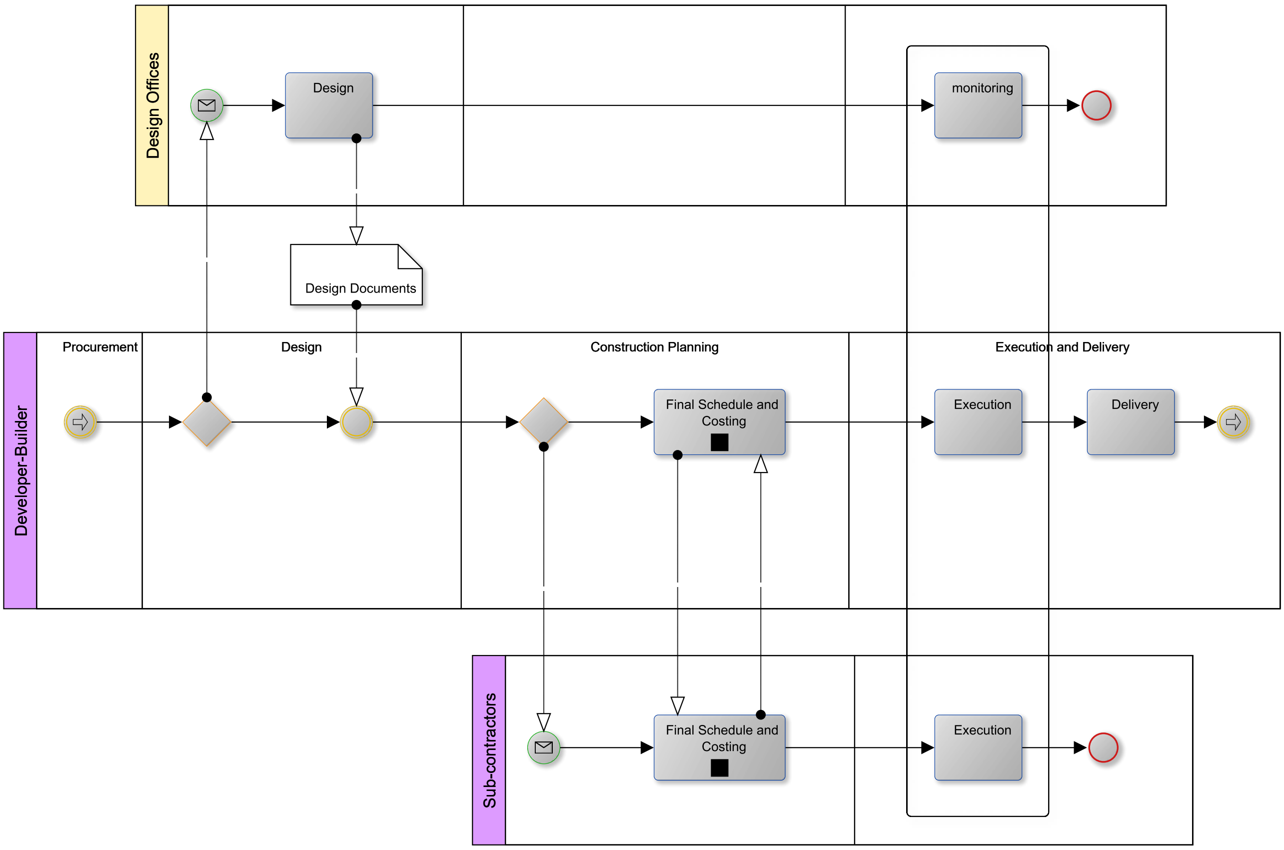
Figure 5.1. Process 1 a – Developer-Builder diagram – Procurement



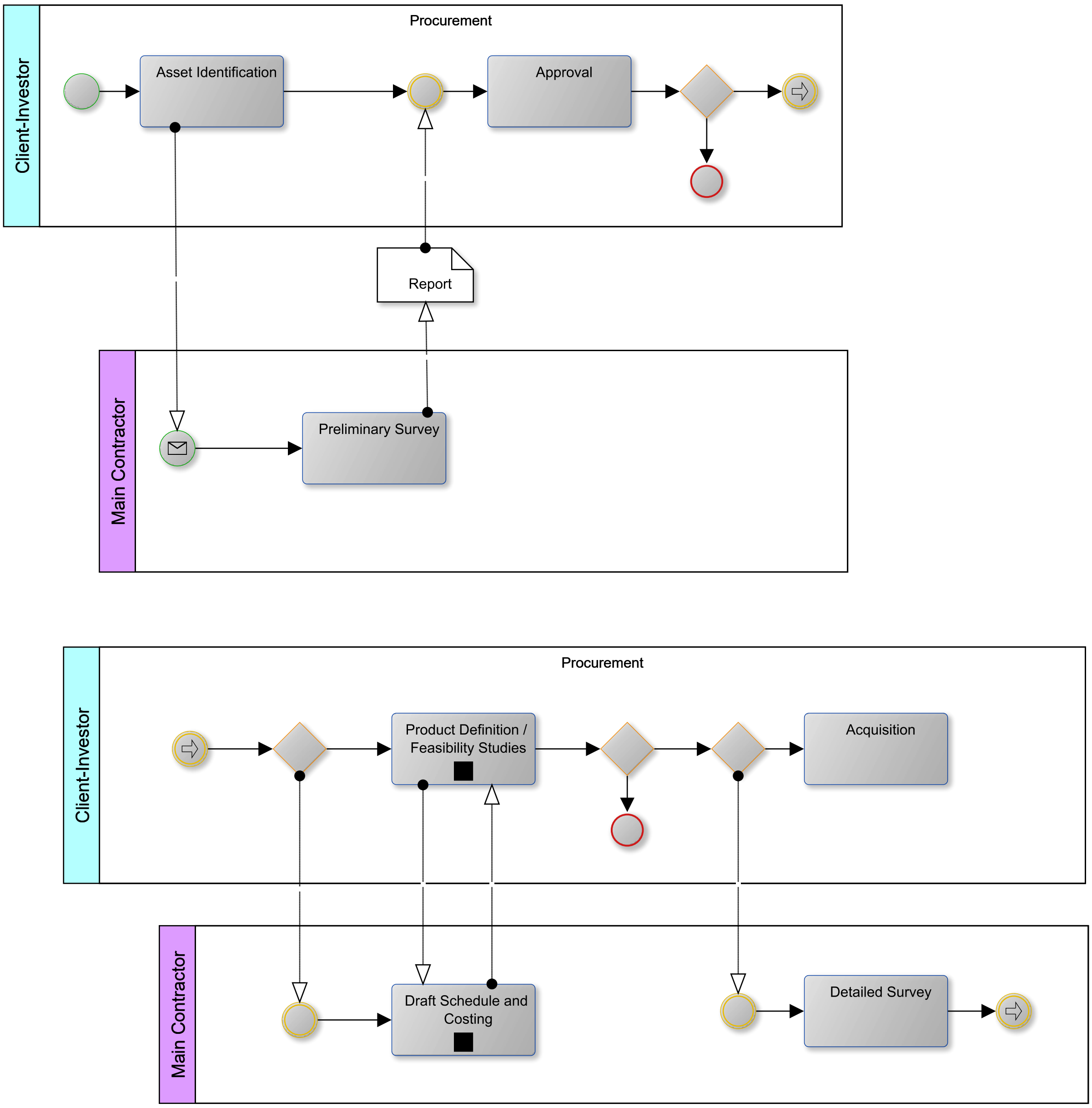
Source: The Authors.

Figure 5.2. Developer-Builder diagram – Design through Delivery



Source: The Authors.

Figure 6.1. Process 1 b – Client/Investor diagram - Procurement



Source: The Authors.

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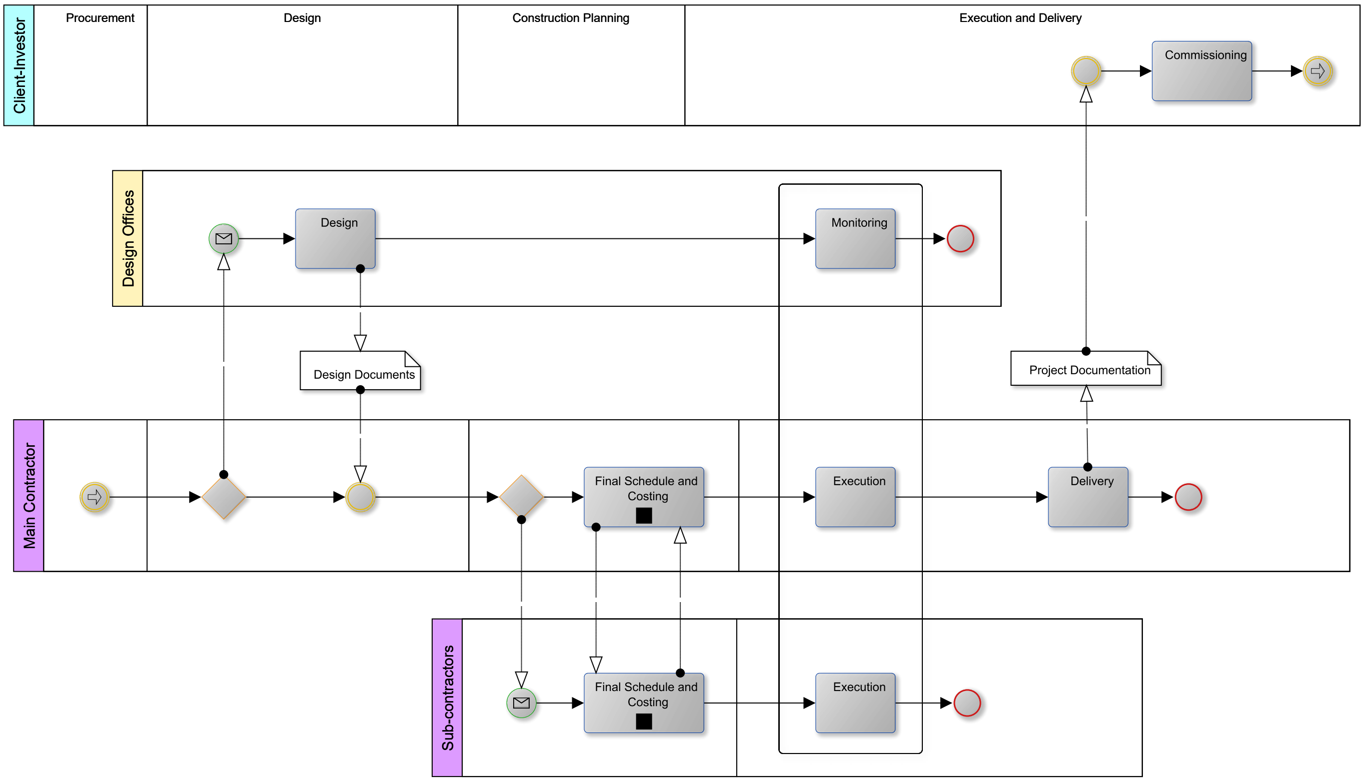
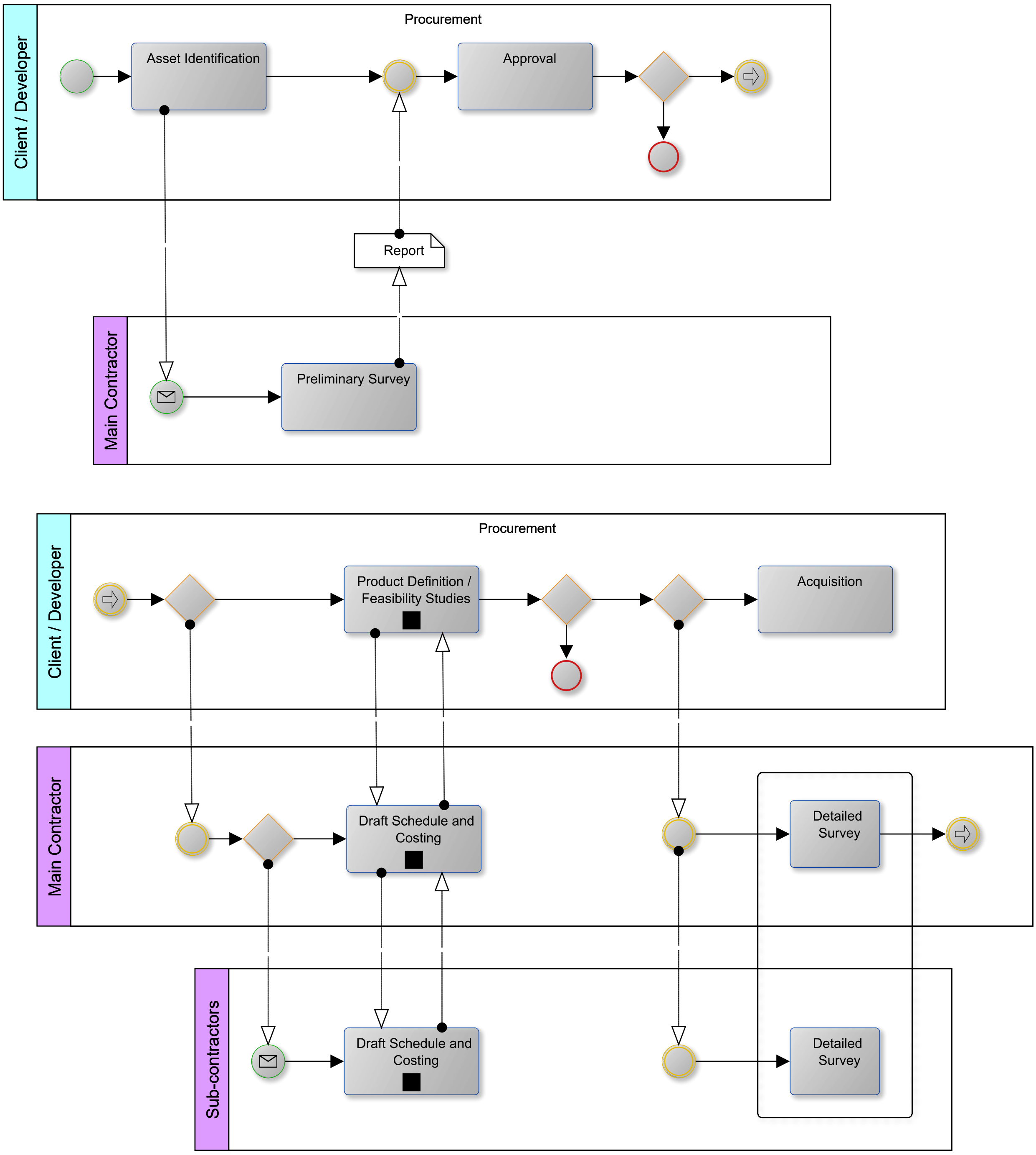
Figure 6.2. Process 1 b – Client/Investor diagram – Design through Delivery



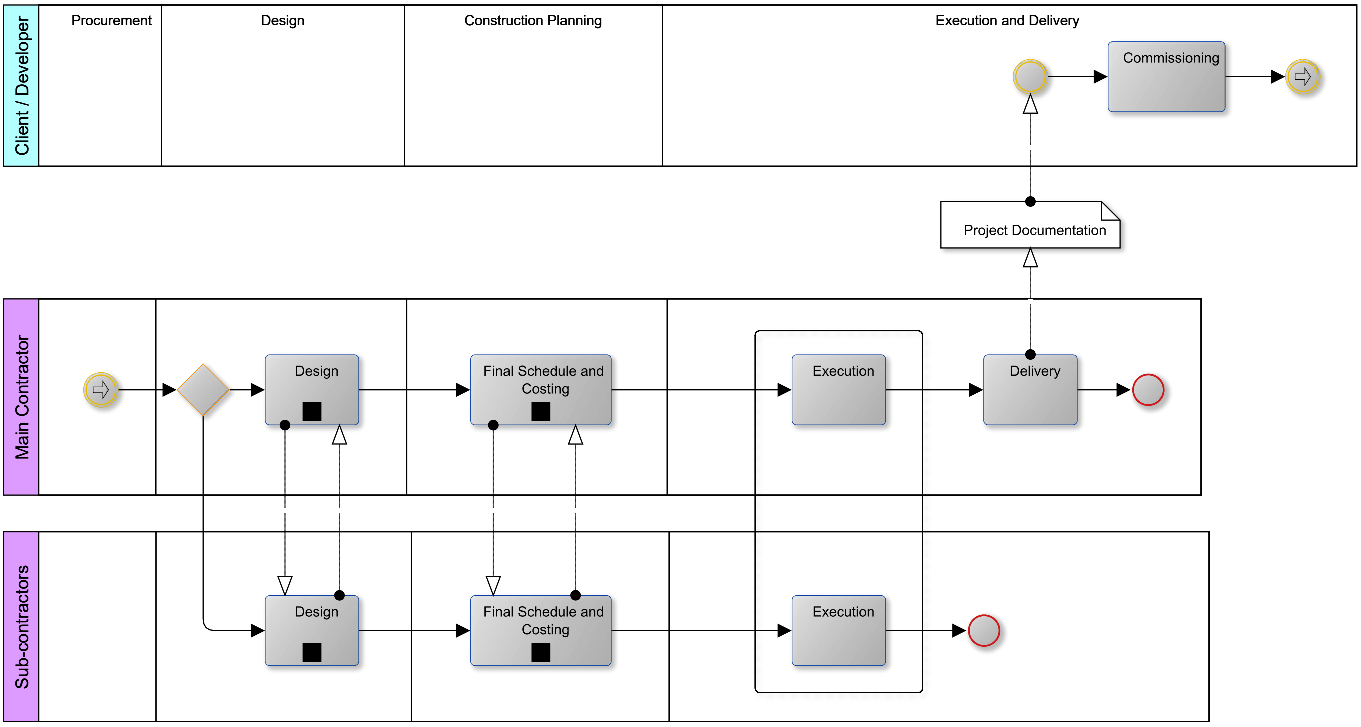
Source: The Authors.

Figure 7.1. Process 2 – Client-Developer diagram - Procurement



Source: The Authors.

Figure 7.2. Process 2 – Client-Developer diagram – Design through Delivery



Source: The Authors.

Differences between these typical processes and the proposed with higher degree of integration can be made, in detail, comparing figures 5.1, 6.1 and/or 7.1, with figures 8.1 and 8.2, and/or 9.1 and 9.2, also comparing figures 5.2, 6.2 and/or 7.2, with figures 8.3 and/or 9.3.

In the diagrams, shown in figures 5 through 7, pools were omitted purposedly to emphasize when an agent has not yet entered the process or when an agent has already left the process. An integrated approach requires that all key players participate in the production process, from procurement to delivery, as shown in figures 8 and 9.

Collaboration is summarized in the diagrams by dashed boxes encompassing the participating agents. Also, dashed arrows are used to pinpoint communication among agents in the form of participation, although not in full collaboration. The diagrams depicting the proposed management approach, shown in figures 8 and 9, exhibit more cases of collaboration and participation among agents, than the ones that depict common practice, shown in figures 5 through 7.

In the case of a typical Process 1, there is no collaboration throughout the procurement stage, because only the Main Contractor and Client/Developer (or Developer-Builder) are present, as shown in figures 5.1 and 6.1. The Design Office enters the process in the next stage, of design, and the sub-contractors enter the process, later, in the construction planning stage, as shown in figures 5.2 and 6.2. There is collaboration only during execution, after all parties have agreed upon the final scheduling and costing, as shown in Figure 6.2.

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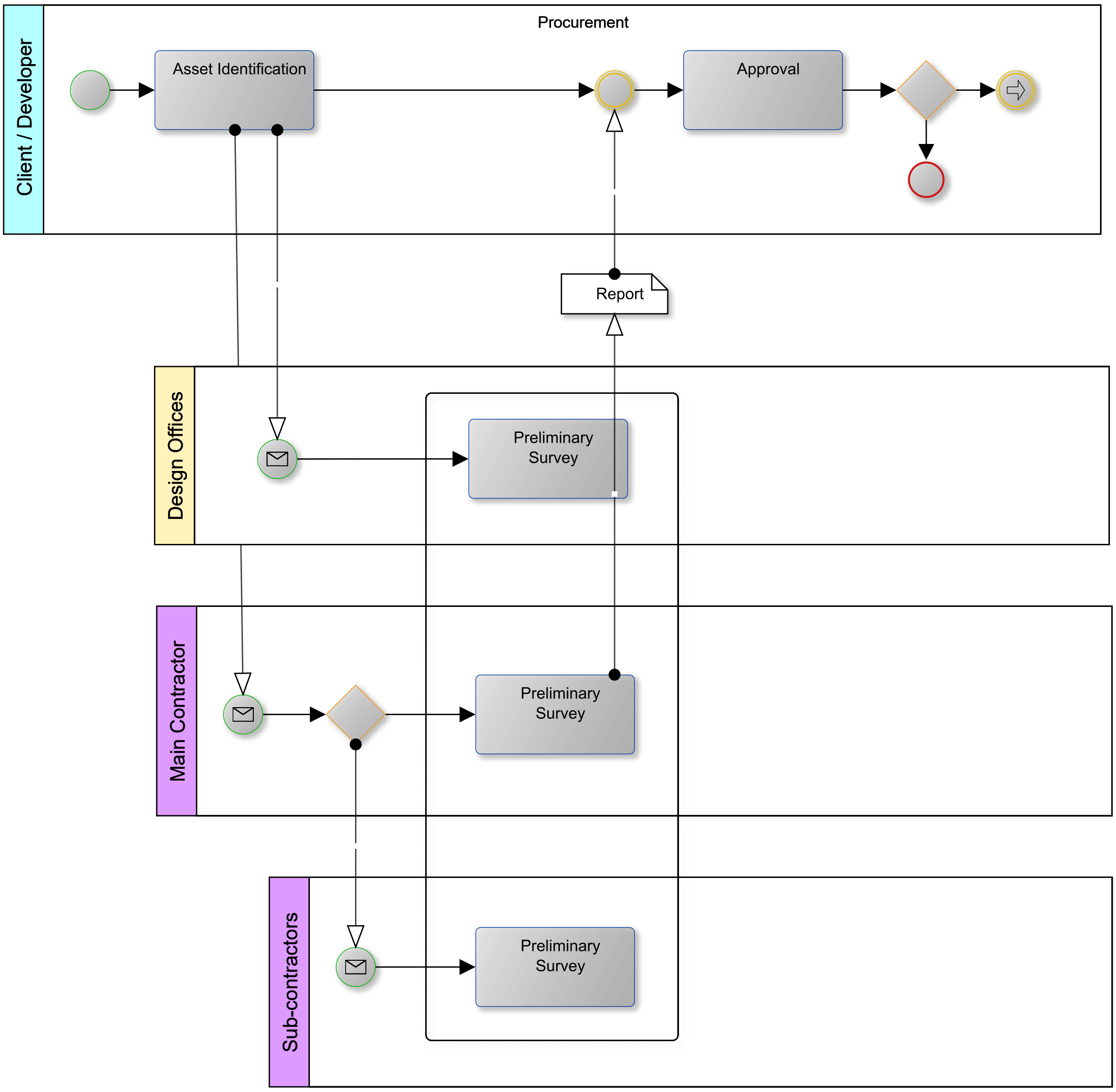
In the case of a typical Process 2, there is collaboration between the Main Contractor and sub-contractors in the detailed survey, at the end of the procurement stage, as shown in Figure 7.1. Designs are done in parallel by the Main Contractor's Design Office and each of the sub-contractors. There is collaboration during execution, after all parties have agreed upon the final scheduling and costing, as shown in Figure 7.2.

Figure 8.1. Proposed Integrated Process – Client or Developer diagram - Procurement (initiate)



Source: The Authors.

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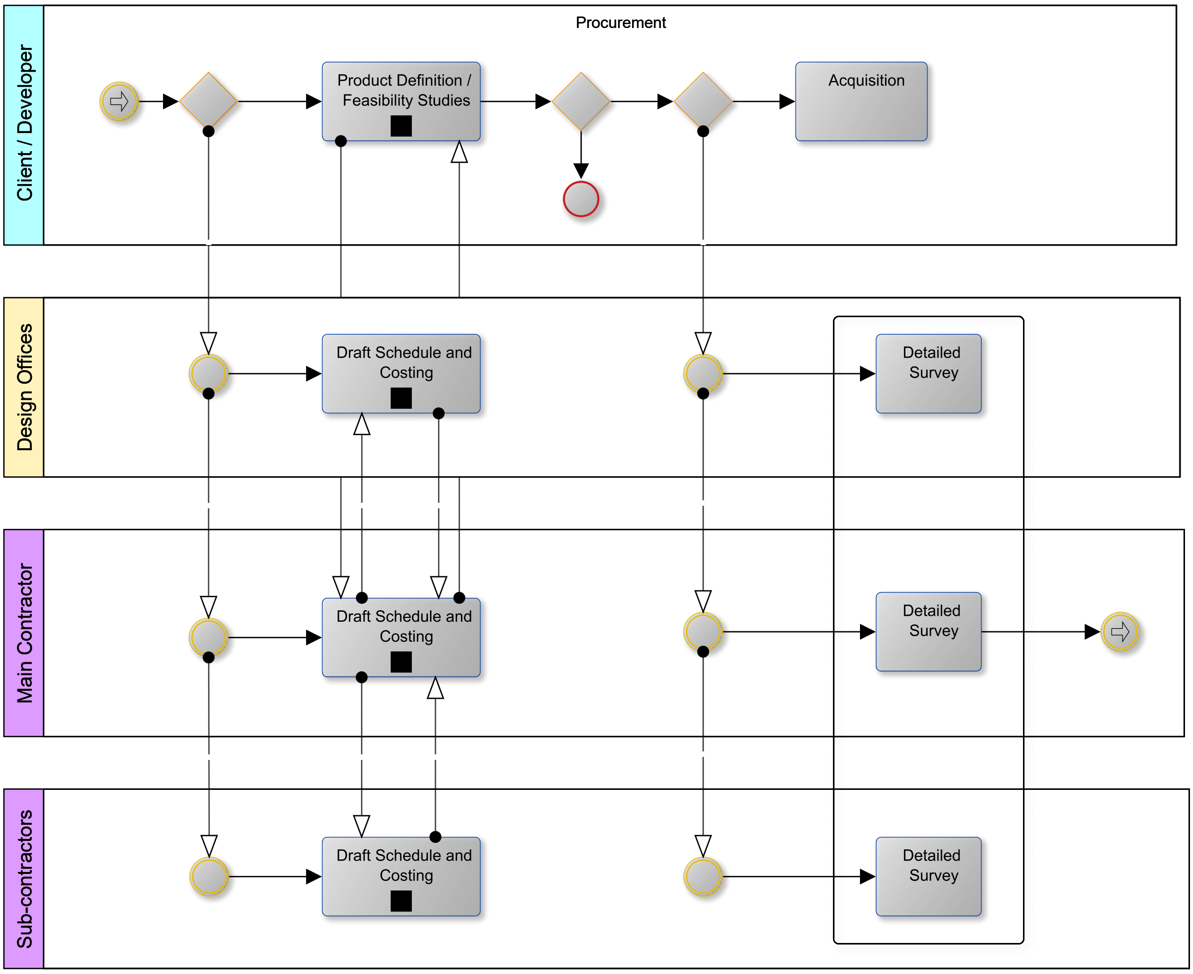
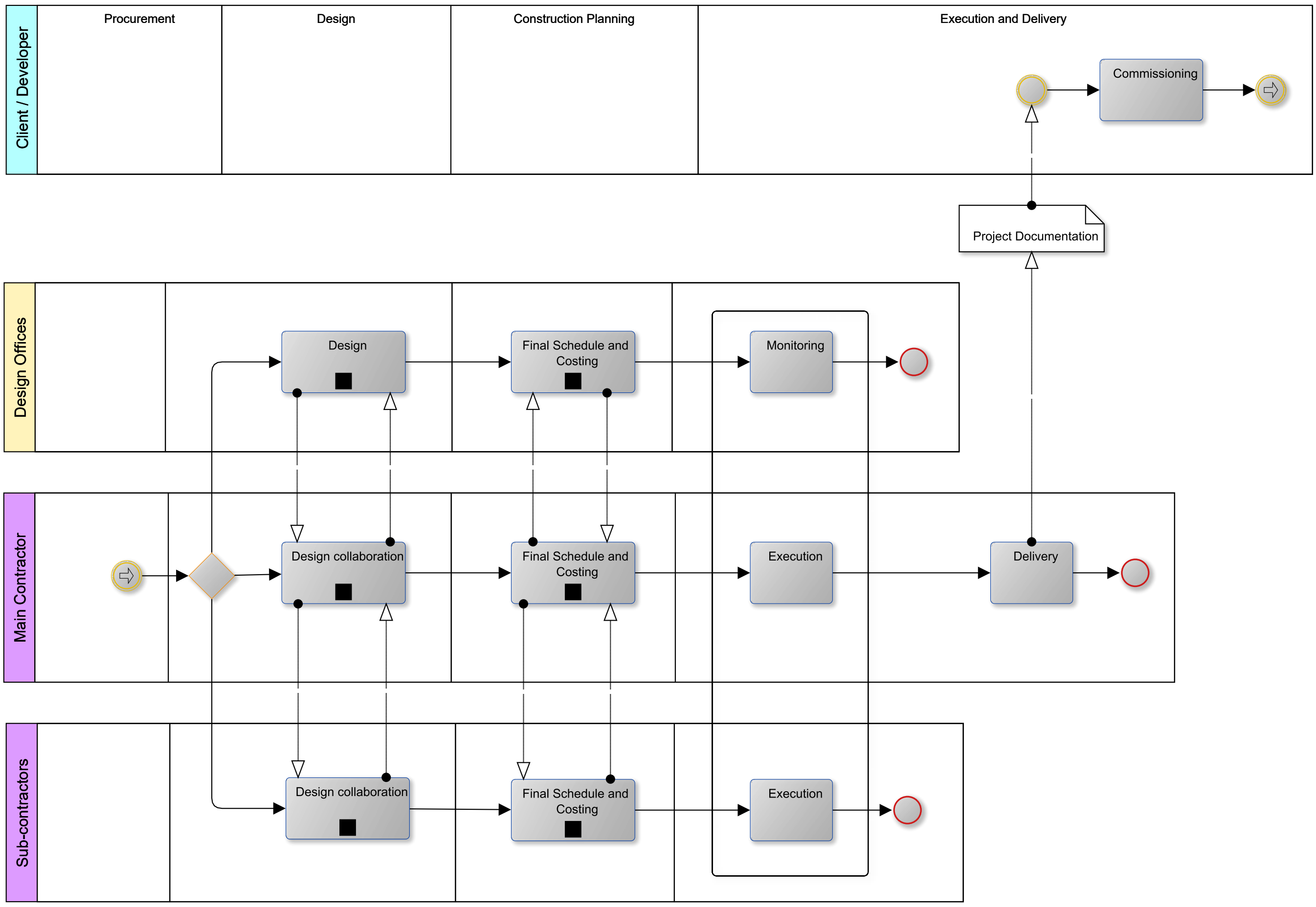
Figure 8.2. Proposed Integrated Process – Client or Developer diagram - Procurement (resume)



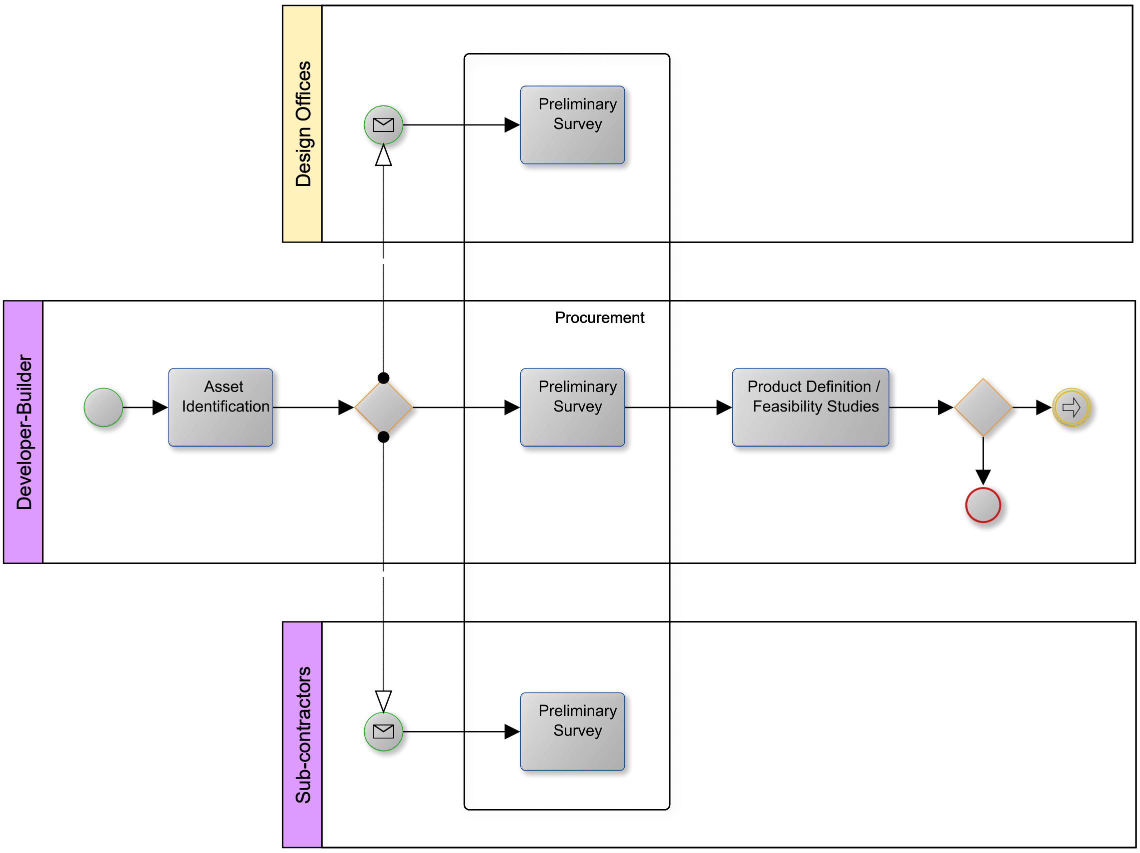
Source: The Authors.

Figure 8.3. Proposed Integrated Process – Client or Developer diagram - Design through Delivery



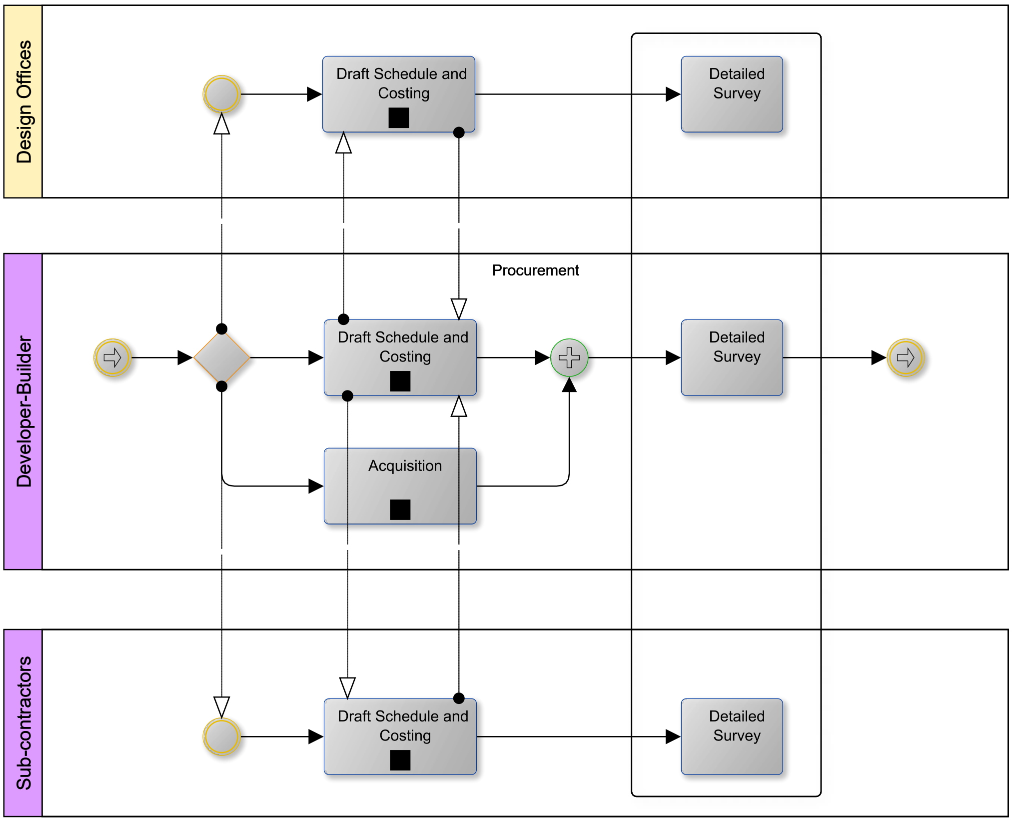
Source: The Authors.

Figure 9.1. Proposed Integrated Process – Developer-Builder diagram - Procurement (initiate)



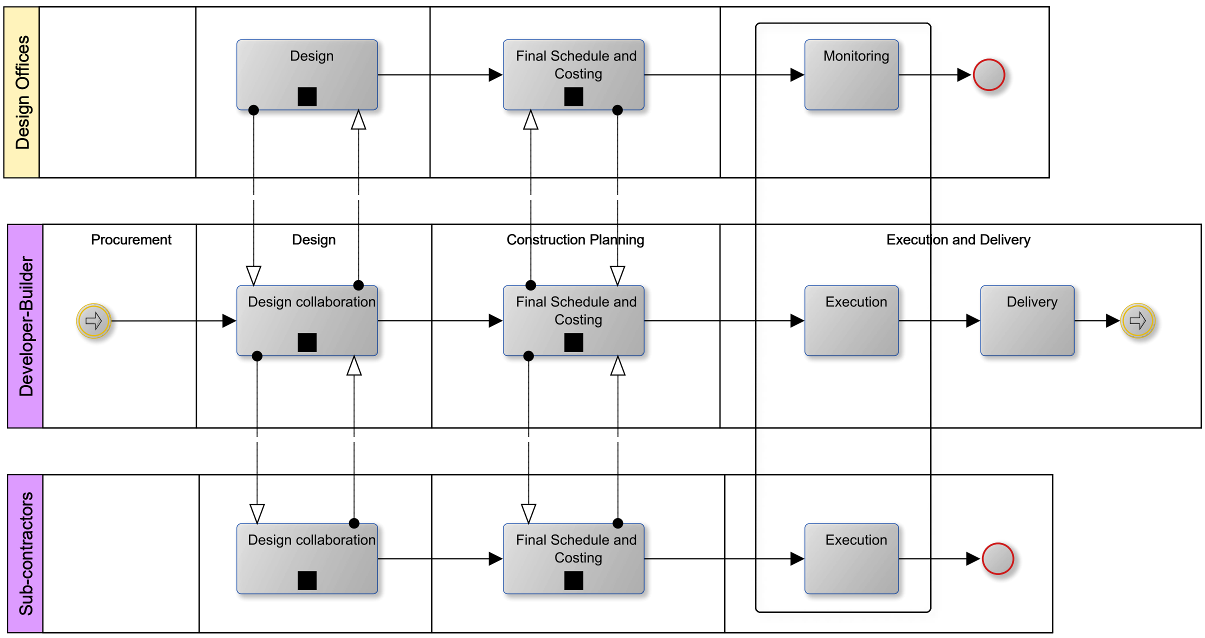
Source: The Authors.

Figure 9.2. Proposed Integrated Process – Developer-Builder diagram - Procurement (resume)



Source: The Authors.

Figure 9.3. Proposed Integrated Process – Developer-Builder diagram - Design through Delivery



Source: The Authors.

In the proposed approach, collaboration occurs:

- in the initial survey, early on the procurement stage, between the Design Office, Main Contractor (or Developer-Builder) and sub-contractors, as shown in figures 8.1 and 9.1;
- in the detailed survey, between the Design Office, Main Contractor (or Developer-Builder) and sub-contractors, in parallel with the acquisition, at the end of the procurement stage, after all parties have agreed upon a draft schedule and costing, as shown in figures 8.2 and 9.2;
- and, in the design, construction planning (final scheduling and costing) and execution stages, between the Design Office, Main Contractor (or Developer-Builder) and sub-contractors, as shown in figures 8.3 and 9.3.

8 Conclusions

In building rehabilitation projects, the traditional sequential approach, in terms of participants' engagement, adopted in the case of new buildings, is clearly inadequate, since it's necessary to consider several of the existing buildings' issues prior to the conceptual design stage. Although linear in essence, the existing processes 1 and 2 have some degree of integration.

The processes described initially are typical of a series of rehabilitation projects in the São Paulo historical center. They also differ from Croitor's (2008) sequential design and build description, because of the early involvement of a main builder, responsible for the whole of the project management. In this sense, they are essentially the transactional type of Construction Management at Risk (CMAR), as described by Eastman *et al.* (2011).

In the section "Integrated Production Process" of this text, an approach towards integration, IPD (American Institute of Architects, 2007) was cited. It is not the case to apply IPD as a method as defined by American Institute of Architects (2014), because it is aimed mainly for new construction projects, and there are practical issues, also regarding such new projects, but to pursue the minimal list of elements regarding such approach. In this sense the proposal would be similar to that of the relational types Project Partnering (PP) or Project Alliance (PA), described by Lahdenperä (2012).

In the proposed Integrated Project approach, the early participation of all agents is part of the production method, supported in a single contract among clients, designers, and builders. Such integration facilitates the exchange of information and design changes that may still result from modifications made during construction.

Nonetheless, such a novel approach will require initially a feasibility assessment, including the commitment of the participants in learning the works of a partnership in relational contracting, as opposed to the traditional transactional schemes, training for collaborative work and the use of contemporary methods for project management, including BIM – Building Information Modeling (for BIM, refer to American Institute of Architects, 2007, 2014; Eastman *et al.*, 2011).

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