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Introduction to the Organizational Cost Community Framework: Update

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Abstract

Organizations often experience conflicts because of role and responsibility overlaps and gaps. While a potential consequence of organizational role and responsibility overlap is inefficiency, the consequence of a gap may result in the lack of sustainable and defensible execution. One specific area of emergent research and assessment, with respect to organizational role and responsibility overlaps and gaps, exists within an organization's ability to generate sustainable and defensible cost estimates. This paper will assist organizations facing the challenge to improve their cost estimation and analysis capabilities through the general characterization of the four interdependent cost functions, their processes, and the participants all within the systematic Organizational Cost Community Framework. This paper has been updated from a previously published paper and now includes an additional distinctive case study which further demonstrates the value and lifecycle applicability of the Organizational Cost Community Framework.

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1. INTRODUCTION

Organizations often experience conflicts because of role and responsibility overlaps and gaps. While a potential consequence of organizational role and responsibility overlap is inefficiency, the consequence of a gap may result in the lack of sustainable and defensible execution. One specific area of emergent research and assessment—with respect to organizational role and responsibility overlaps and gaps—exists within an organization's ability to generate sustainable and defensible cost estimates. While the comparison of outputs describes areas of organizational overlap, gaps are more difficult to identify. Gaps can be intentionally created, but often exist due to their non-existence being unknown. [1] This paper characterizes cost estimation and the three other enabling inter-dependent cost functions—cost infrastructure, cost management, and cost analysis—within a systematic process. The systematic process characterized herein will assist an organization with the challenge of identifying organizational gaps and improving their cost estimation capabilities.

All four cost functions—cost estimation, cost analysis, cost infrastructure, and cost management—make up an organization's cost community and through their inter-dependence, enable an organization to generate sustainable and defensible cost estimates. An organization's ability to generate sustainable cost estimates requires the organization's leadership to be aware of how investment decisions may influence the capabilities of the functional areas of the cost community in the near and long-term. Furthermore, the defensibility of an organization's cost estimates relies on the ability to defend the product's credibility, validity, traceability, and repeatability. [2] This paper *will not* uniquely define the details of the four cost functions of the cost community, the process steps, or the participants, but will instead, rely on generalized definitions and provide literature resources. The generalization of definitions creates flexibility that enables the custom application of this construct within any organization.

In addition to the generalized definitions of the four functional areas that make up the cost community, this paper provides processes, process steps, and participants for each of the four functional areas. Furthermore, this paper may be the first research effort to provide a detailed walkthrough of case studies to describe the interdependence of the cost functions in an organization.

This paper has been updated from a previously published paper and now includes an additional distinctive case study which further demonstrates the value and lifecycle applicability of the Organizational Cost Community Framework. [33]

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2. COST COMMUNITY

As previously stated, four cost functions—cost estimation, cost analysis, cost infrastructure, and cost management—make up an organization's cost community. The cost community is the collective view of these four cost functions. The order of the four cost functions has no significance. Each of the cost functions is required for an organization to have a sustainable and defensible cost estimation capability. This paper does not intend to develop a unique definition of the four cost functions.

This paper will focus on general descriptions of the process steps of each of the four cost functions. The references provided by cost function below will assist an organization seeking to define the appropriate detailed definitions of each of the cost functions:

- Cost Analysis – The act of analyzing cost [3, 4, 5, 6,7, 8, 9, 10, 11]
- Cost Estimation – The act of estimating cost [2,12, 13, 14, , 15, 16, 17, 18, 19, 20, 21, 22, 23]
- Cost Infrastructure – The act of assisting cost [19 ,24, 25,26 , 27]
- Cost Management – The act of managing cost [28,29, 30, 31, 32]

Note: *This paper is intentionally general and not detailed with respect to the definitions of the cost functions, their process steps and related participants. The paper supplants an interdependent framework to support an organization's exploration of their cost community, to improve their abilities to execute defensible and sustainable cost estimation and analysis, while recognizing that individual organizations have unique attributes. The cost functions only identify cross-functional overlap, but do not include cross-functional definitions; the degree of cross-functional scope varies based on the unique attributes of the organization. The cost function process steps are generalized and do not include detailed definitions of each of the steps nor the steps that may exist in-between. The participant characteristics are a function of the cross-functional design of the organization, no participant characteristics are included in this paper.*

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3. COST FUNCTIONS

Figure 1 is a Venn diagram of the cost community that illustrates the overlap of the four cost functions. This overlap represents scope and describes the interdisciplinary nature of the cost community among other things. [3] It is important that an organization recognize the overlapping nature of the cost functions of the cost community. Cost products, in most cases, require direct input from two or more cost functions and indirectly affect all functions as a function of time. In order to deliver a cost product from the cost community, it is important that each cost function utilize a sequential and consistent process to support the identification of required inputs, participants, and overall organizational communication.

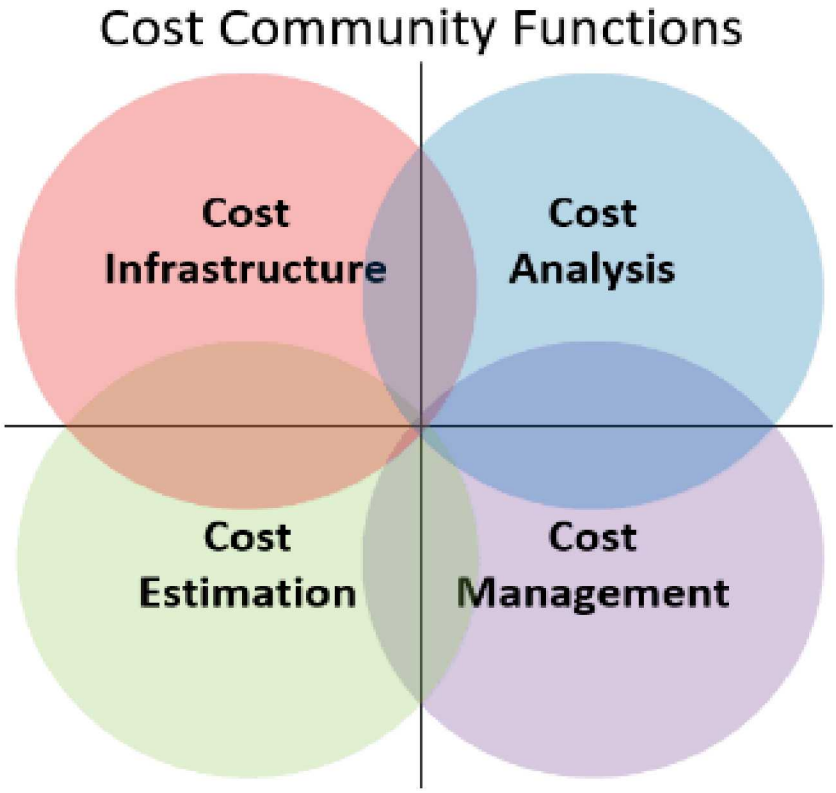

Figure 1. Cost Community Venn Diagram

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4. PROCESS STEPS OF THE COST FUNCTIONS

The Organizational Cost Framework references the bodies of knowledge that have published general processes for cost estimation, cost analysis, and cost management to build a table of six steps that each of the four cost functions follow, as shown in Table 1.

As previously stated, this paper will be consistent in *not* defining detailed scope of each step, but rather relying on the general understanding of the name of the step. This will enable flexibility for an organization to define the detailed scope. The references provided in the Cost Community section by cost function will assist an organization in defining the details of each of the cost functions process steps.

Table 1. Process Steps of the Cost Functions

Process Step	Cost Analysis Process View	Cost Planning Process View	Cost Management Process View	Cost Infrastructure Process View
1	Initiate Cost Analysis	Initiate Cost Planning	Initiate Cost Management	Initiate Cost Infrastructure
2	Define Cost Analysis	Define Cost Planning	Define Cost Management	Define Cost Infrastructure
3	Execute Cost Analysis	Execute Cost Planning	Execute Cost Management	Execute Cost Infrastructure
4	Review Cost Analysis	Review Cost Planning	Review Cost Management	Review Cost Infrastructure
5	Close-Out Cost Analysis	Close-Out Cost Planning	Close-Out Cost Management	Close-Out Cost Infrastructure
6	Submit to Cost Analysis Data Repository	Submit to Cost Planning Data Repository	Submit to Cost Management Data Repository	Submit to Cost Infrastructure Data Repository

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5. PARTICIPANTS OF THE PROCESS STEPS OF THE COST FUNCTIONS.

The Organizational Cost Framework identifies general participants involved in each cost function's process steps, as shown in Table 2. As stated, this paper does not uniquely define participant skills, capabilities, certifications, degrees, experience, knowledge, etc.

Table 2. Participants of the Process Steps of the Cost Functions

		Process Step	Cost Analysis Process View	Cost Planning Process View	Cost Management Process View	Cost Infrastructure Process View
Process Step 1	Name	1	Initiate Cost Analysis	Initiate Cost Planning	Initiate Cost Management	Initiate Cost Infrastructure
	Participants		*Cost Analysis Team* *Cost Analysis Customer*	*Cost Planning Team* *Cost Planning Customer*	*Cost Management Team* *Cost Management Customer*	*Cost Infrastructure Team* *Cost Infrastructure Customer*
Process Step 2	Name	2	Define Cost Analysis	Define Cost Planning	Define Cost Management	Define Cost Infrastructure
	Participants		*Cost Analysis Team* *Cost Analysis Customer*	*Cost Planning Team* *Cost Planning Customer*	Cost Management Team Cost Management Customer	Cost Infrastructure Team Cost Infrastructure Customer
Process Step 3	Name	3	Execute Cost Analysis	Execute Cost Planning	Execute Cost Management	Execute Cost Infrastructure
	Participants		*Cost Analysis Team*	*Cost Planning Team*	*Cost Management Team*	*Cost Infrastructure Team*
Process Step 4	Name	4	Review Cost Analysis	Review Cost Planning	Review Cost Management	Review Cost Infrastructure
	Participants		*Cost Analysis Team* *Cost Analysis Customer* *Cost Analysis Review Team*	*Cost Planning Team* *Cost Planning Customer* *Cost Planning Review Team*	*Cost Management Team* *Cost Management Customer* *Cost Management Review Team*	*Cost Infrastructure Team* *Cost Infrastructure Customer* *Cost Infrastructure Review Team*
Process Step 5	Name	5	Close-Out Cost Analysis	Close-Out Cost Planning	Close-Out Cost Management	Close-Out Cost Infrastructure
	Participants		*Cost Analysis Team*	*Cost Planning Team*	*Cost Management Team*	*Cost Infrastructure Team*
Process Step 6	Name	6	Submit to Cost Analysis Data Repository	Submit to Cost Planning Data Repository	Submit to Cost Management Data Repository	Submit to Cost Infrastructure Data Repository
	Participants		*Cost Analysis Team*	*Cost Planning Team*	*Cost Management Team*	*Cost Infrastructure Team*

This paper will be consistent in *not* defining participant characteristics, but rather relying on the general understanding of the participant names. This will enable flexibility for organizations seeking to define participant characteristics. The references of this paper provided in Section 2. Cost Community by cost function will support an organization seeking to define participant characteristics of each of the cost functions process steps.

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6. ORGANIZATIONAL COST COMMUNITY FRAMEWORK

The four cost functions, the process steps, and their participants render the Organizational Cost Community Framework in Figure 2. The Organizational Cost Community Framework characterizes the lifecycle of an organizations' cost products through a traceable, systematic, and sequential process.

Each of the case studies then includes general descriptions of the sequence of steps that demonstrate the utility of the Organizational Cost Community Framework. The design of the case studies in this paper do not focus on a particular cost function or interdependency. This paper will be consistent by not adding any previously undisclosed detail pertaining to the definitions of the cost functions, process steps, or participants.

The legend in Table 3 designates the sequentially numbered steps for each specific case study featured in the following Figures 3 through Figure 6.

Table 3. Case Study Legend

Case Study 1	Steps 1 through Step 6 (Figure 3)
Case Study 2	Steps 7 through Step 22 (Figure 4)
Case Study 3	Steps 23 through Step 32 (Figure 5)
Case Study 4	Steps 33 through Step 44 (Figure 6)

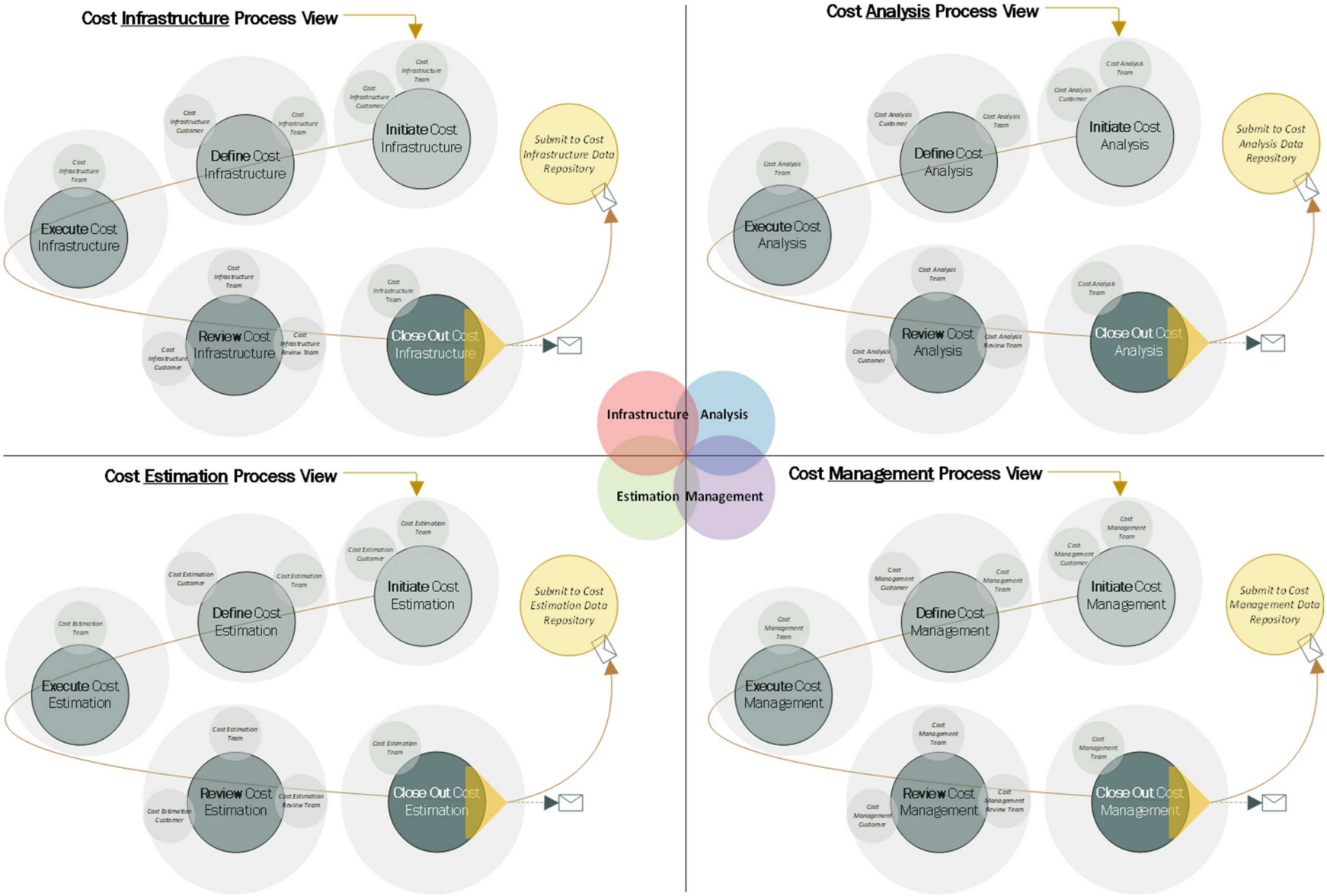

Figure 2. Organizational Cost Community Framework

6.1. Case Study 1

Case Study 1

An organization receives a request from an external customer for a cost estimate based on a redesign of an asset that the organization previously designed in the mid-1990s. In the mid-1990s, the organization was in the early stages of capturing cost data in digital format. The customer request placed a substantial time constraint on the Cost Estimation Team and their priorities did not include sufficient time to discover historical cost data.

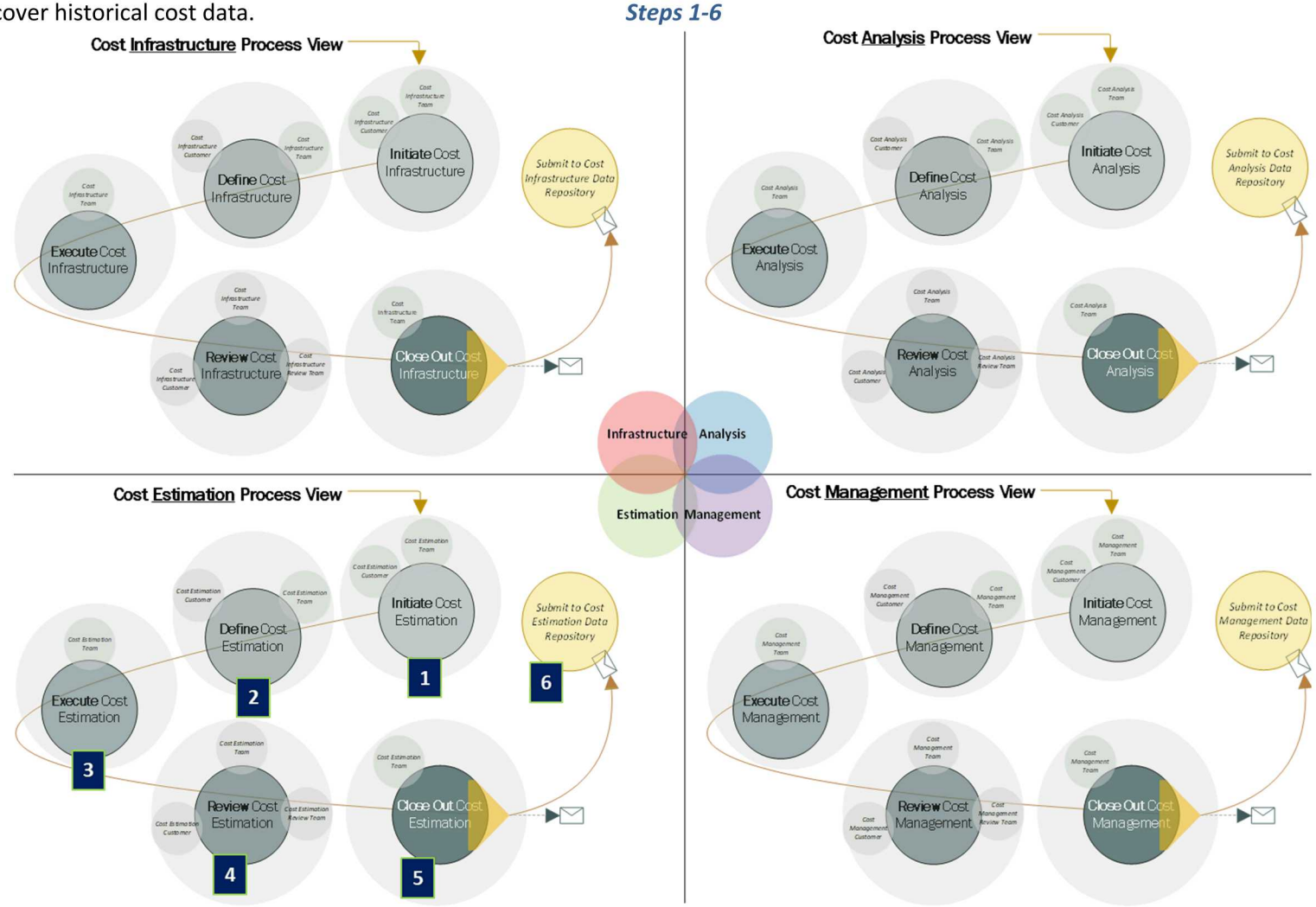

Figure 3. Organizational Cost Community Framework Case Study 1

6.1.1. Case Study 1: Process Step Descriptions

1. **Initiate Cost Estimation** – The Cost Estimation Customer requests a cost estimate from the organization's Cost Estimation Team.

2. **Define Cost Estimation** – The Cost Estimation Team and the Cost Estimation Customer define the scope of the cost estimate. The cost estimate definition is a minor redesign of a previously designed asset by the organization.

3. **Execute Cost Estimation** – The Cost Estimation Team did not have knowledge of any cost data that existed with respect to the development of the previously designed asset. The Cost Estimation Team decides to execute a cost estimate without the previous assets data reference.

4. **Review Cost Estimation** – The Cost Estimation Team completes the cost estimate and follows organizational requirements to have it reviewed by the organization's leadership as part of the Cost Estimation Review Team. The Cost Estimation Review Team reviews the cost estimate and the scope of the asset. The Cost Estimation Review Team is not comfortable with the absence of the historic cost data due to the unique nature of the asset. The Cost Estimation Review Team rejects the cost estimate and requests that the Cost Estimation Team initiate a cost analysis with the goal of discovering the assets historic cost data and aligning it with the scope of the redesign cost estimate.

5. **Close Out Cost Estimation** – The Cost Estimation Team saves the static cost estimate package for future use.

6. **Submit to Cost Estimation Data Repository** – The Cost Estimation Team submits the static cost estimate package into the Cost Estimation Data Repository.

6.2. Case Study 2

Case Study 2

Based on the feedback that the Cost Estimation Team received in Case Study 1 from the organization's leadership, the Cost Estimation Team initiated the Cost Analysis Process to explore what historic data may exist with respect to their asset in order to revisit the Cost Estimation Process.

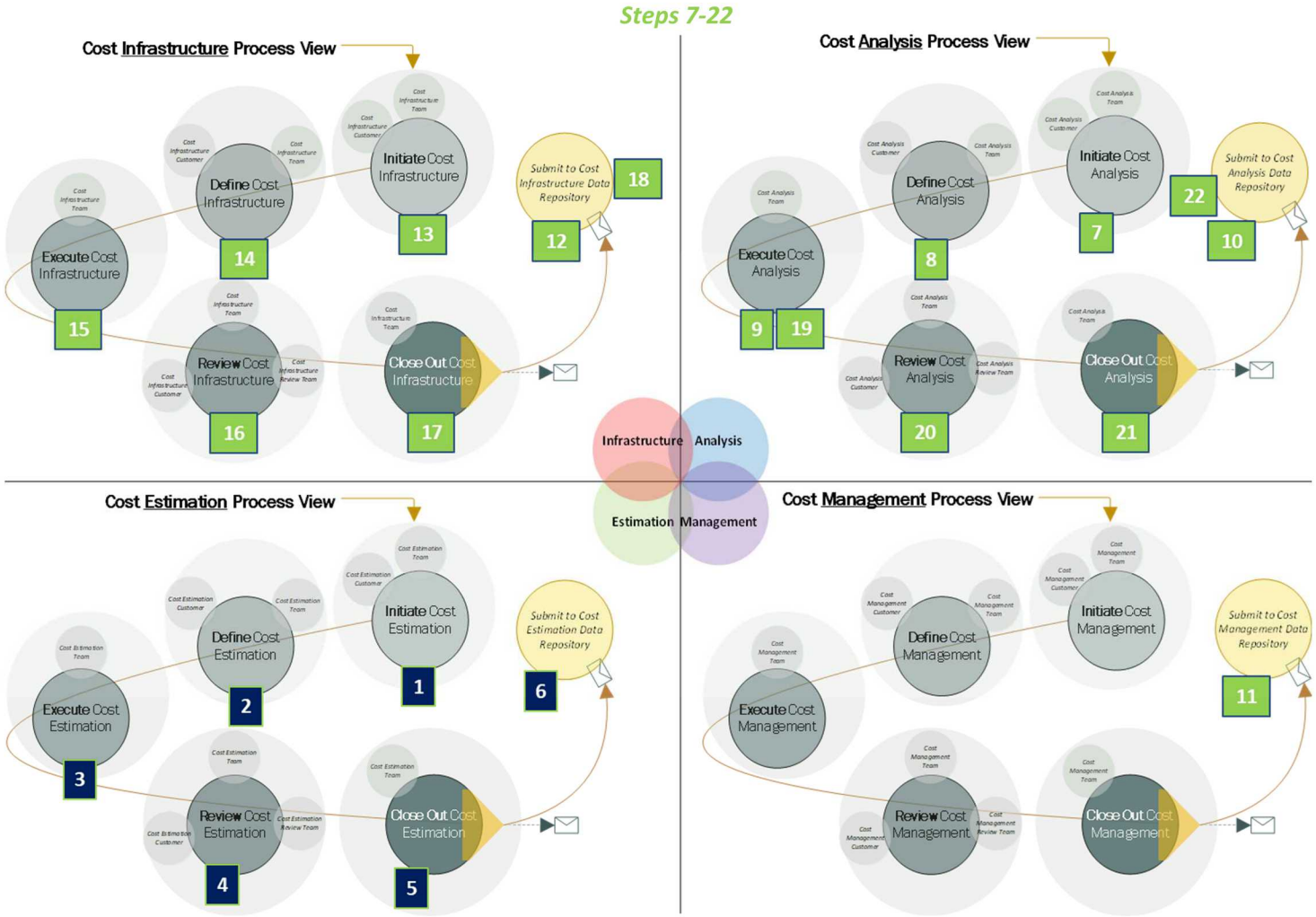

Figure 4. Organizational Cost Community Framework Case Study 2

6.2.1. Case Study 2: Process Step Descriptions

7. **Initiate Cost Analysis** – The Cost Estimation Team initiates a cost analysis following the direction of the Cost Estimation Review Team. This is done in order to inform their cost estimate with data from the preceding asset.

8. **Define Cost Analysis** – The Cost Estimation Team (Cost Analysis Customer) and the Cost Analysis Team define the cost analysis product. The definition includes the exploration and collection of historic cost data, organization and normalization of the historic cost data, and alignment to the current scope of the assets redesign cost estimation package.

9. **Execute Cost Analysis** – The Cost Analysis Team explores the Cost Management, Cost Analysis, and Cost Infrastructure Data Repositories.

10. **Explore Cost Analysis Data Repository** – The Cost Analysis Data Repository does not render any valuable data in support of this effort.

11. **Explore Cost Management Data Repository** – The Cost Management Data Repository does render thousands of artifacts that included charging codes with related scope, but no traceable cost values.

12. **Explore Cost Infrastructure Data Repository** – The Cost Infrastructure Data Repository does render a historical database of charging codes with traceable cost values.

13. **Initiate Cost Infrastructure** – The discovery of the historical cost database prompts the Cost Analysis Team to initiate the Cost Infrastructure Process.

14. **Define Cost Infrastructure** – The Cost Infrastructure request includes gaining access and collaboration with the Cost Infrastructure Team to verify that the values in the database match the values of the organization's formal historic reporting.

15. **Execute Cost Infrastructure** – The Cost Infrastructure Team completes the request, the Cost Analysis Team gains access to the database, and the teams complete the verification of the database.

16. **Review Cost Infrastructure** – The Cost Infrastructure Review Team completes the review of the request.

17. **Close Out Cost Infrastructure** – The Cost Infrastructure Team documents and closes the request.

18. **Submit to Cost Infrastructure Data Repository** – The Cost Infrastructure Team submits the product to the Cost Infrastructure Data Repository.

19. **Execute Cost Analysis** – The Cost Analysis Team executes the cost analysis with the acquired scoping artifacts and traceable cost data.

20. **Review Cost Analysis** – The Cost Analysis Review Team approves the cost analysis for submission to the Cost Estimation Team.

21. **Close Out Cost Analysis** – The Cost Analysis Team documents and closes out the analysis.

22. **Submit to Cost Analysis Data Repository and to Cost Estimation Team** – The Cost Analysis Team submits the cost analysis to the Cost Estimation Team and to the Cost Analysis Data Repository.

6.3. Case Study 3

Case Study 3

The Cost Analysis Team, through the Cost Analysis Process, completed the scope defined by the Cost Estimation Team in Case Study 2. The Cost Estimation Team revisits the Cost Estimation Process to seek approval from organizational leadership.

Steps 23-32

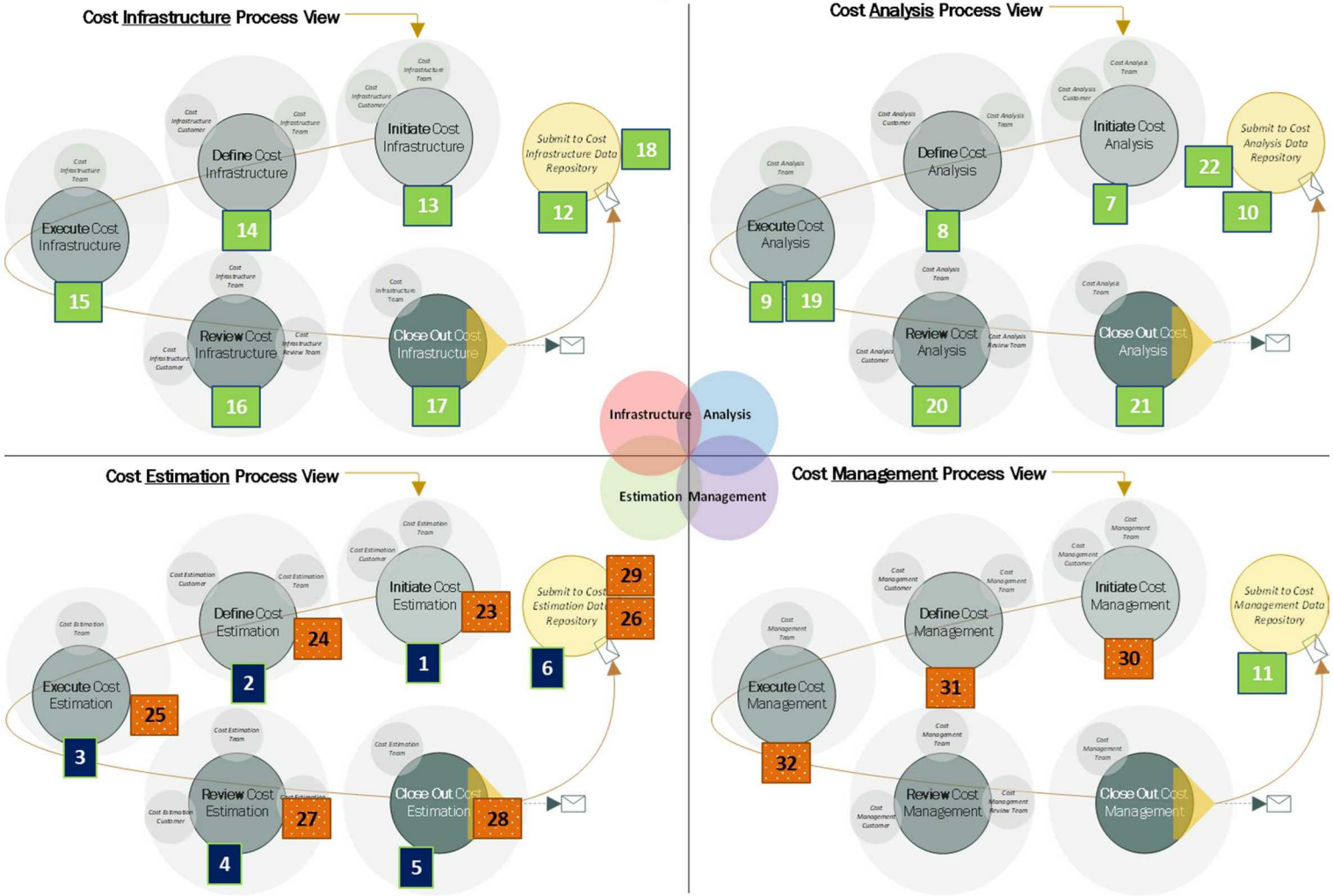

Figure 5. Organizational Cost Community Framework Case Study 3

6.3.1. Case Study 3: Process Step Descriptions

23. **Initiate Cost Estimation** – The Cost Analysis Team in Case Study 2 sent the completed cost analysis package to the Cost Estimation Team to support the Cost Estimation Customer request from Case Study 1. The Cost Estimation Process starts again with Initiate Cost Estimation.

24. **Define Cost Estimation** – The Cost Estimation Team verifies with the Cost Estimation Customer that the definition of the cost estimate is the same as Case Study 1.

25. **Execute Cost Estimation** – The Cost Estimation Team utilizes the cost analysis to inform their cost estimate.

26. **Explore Cost Estimation Data Repository** – The Cost Estimation Team further utilizes the completed cost estimate package from Case Study 1 to present to serve as an artifact of comparison for the Cost Estimation Review Team.

27. **Review Cost Estimation** – The Cost Estimation Review Team appreciates that the Cost Estimation Team informed the cost estimate with the predecessor assets information from a verified cost analysis and approves the cost estimate package.

28. **Closeout Cost Estimation** – The Cost Estimation Team documents and closes out the cost estimate package.

29. **Submit to Cost Estimation Data Repository and Cost Estimation Customer** – The Cost Estimation Team saves the details of the request in the Cost Estimation Data Repository and submits the final cost estimate package to the Cost Estimation Customer.

30. **Initiate Cost Management** – The Cost Estimation Customer approves the cost estimate package. The organization initiates cost management.

31. **Define Cost Management** – The Cost Management Team defines the requirements and develops the cost management package.

32. **Execute Cost Management** – The Cost Management Team executes cost management.

6.4. Case Study 4

Case Study 4 The Cost Analysis Team, based on their discovery of historic cost data from Case Study 2, initiated the Cost Analysis Process to reconcile the continuum of historic cost data. Furthermore, the Cost Analysis Team initiated the Cost Infrastructure Process to develop an enabling capability to use the historic data for future estimation and analysis.

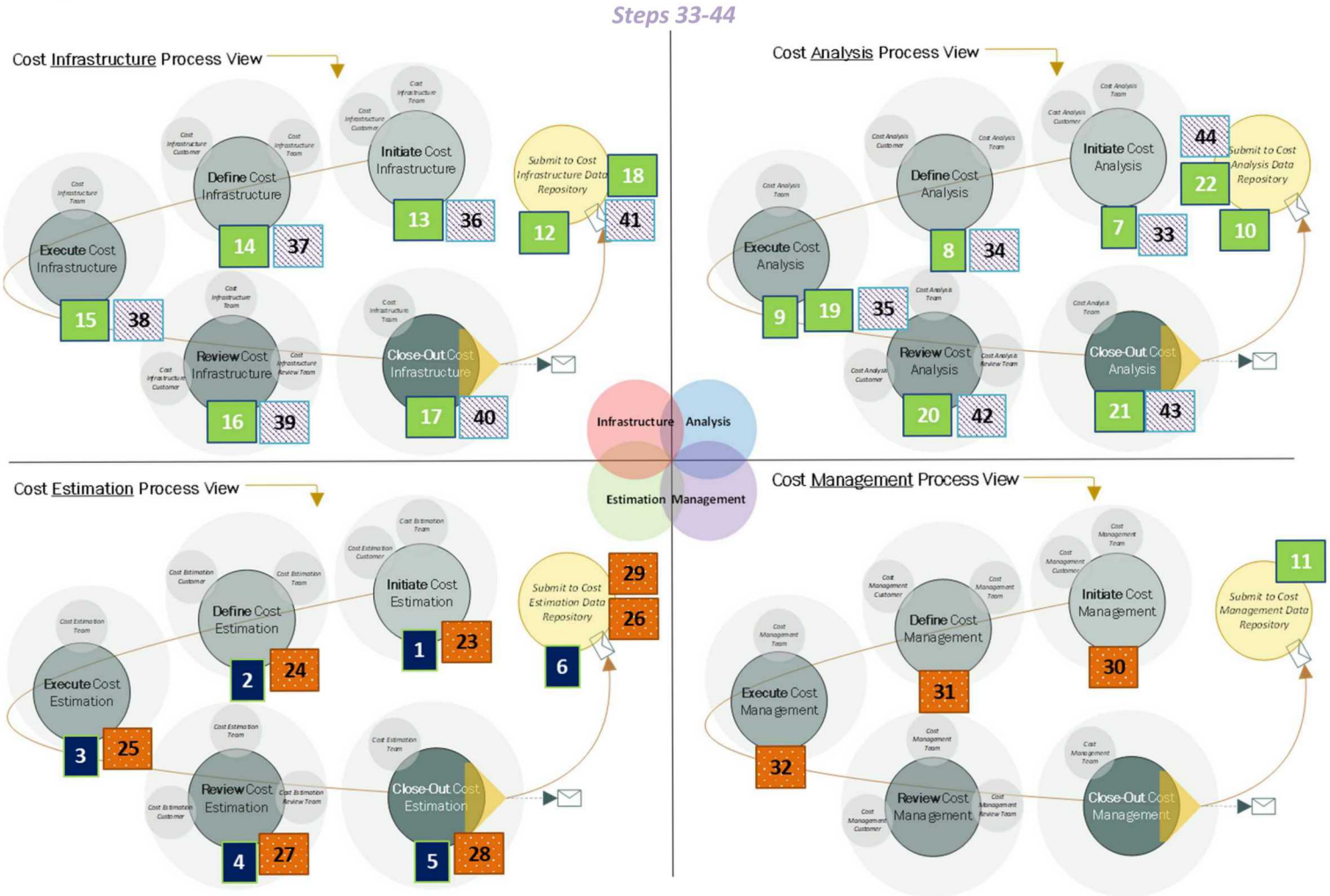

Figure 6. Organizational Cost Community Framework Case Study 4

6.4.1. Case Study 4: Process Step Descriptions

33. Initiate Cost Analysis – Based on the discovery of historic cost data from Case Study 2, the Cost Analysis Team revisits the Cost Analysis Process and becomes their own customer for Initiate Cost Analysis.

34. **Define Cost Analysis** – The Cost Analysis Team defines the analysis as the reconciliation of the continuum of historic cost data to include the newly discovered data. Furthermore, the Cost Analysis Team defines the requirement to develop a cost infrastructure capability in order to traverse the historic cost data and support future cost community products.

35. Execute Cost Analysis – The Cost Analysis Team executes the reconciliation of the historic cost data. Additionally, the Cost Analysis Team becomes the customer in the Cost Infrastructure Process.

36. **Initiate Cost Infrastructure** – The Cost Analysis Team describes the requirement to develop a cost infrastructure capability to traverse the continuum of historic cost data to support future cost community products with the Cost Infrastructure Team in the Initiate Cost Infrastructure step of the Cost Infrastructure Process.

37. **Define Cost Infrastructure** – The Cost Analysis Team and the Cost Infrastructure Team work together to complete the definition of requirements of the cost infrastructure capability that will include the reconciled historic cost data.

38. **Execute Cost Infrastructure** – The Cost Infrastructure Team executes the requirements of the capability.

39. **Review Cost Infrastructure** – The Cost Infrastructure and Cost Analysis Team review the completed development of the cost infrastructure capability.

40. **Close Out Cost Infrastructure** – The Cost Infrastructure Team closes out the documentation of the completed cost infrastructure capability for the Cost Analysis Team.

41. **Submit to Cost Infrastructure Data Repository** – The Cost Infrastructure Team submits the documentation of the completed scope to the Cost Infrastructure Data Repository.

42. **Review Cost Analysis** – The Cost Analysis Team reviews the reconciled historic cost data and the completed cost infrastructure capability completed by the Cost Infrastructure Team.

43. **Close Out Cost Analysis** – The Cost Analysis Team closes out the documentation of the reconciliation of the continuum of historic cost data and the cost infrastructure capability completed by the Cost Infrastructure Team.

44. **Submit to Cost Analysis Data Repository** – The Cost Analysis Team submits the completed documentation into the Cost Analysis Data Repository.

7. SUMMARY

The four cost functions, the process steps, and their participants render the Organizational Cost Community Framework. This paper—through a series of interdependent case studies—demonstrates the sequential process through the Organizational Cost Community Framework's four cost functions. Each case study includes descriptions of each step to support the Organizational Cost Community Framework utility and applicability to other organizational case studies.

It is important to note the sequence that initiates and completes each of the case studies. The Organizational Cost Community Framework maintains a historical, traceable, sequential process record that will improve an organization's ability to prepare for future cost products. The generalized descriptions of the four cost functions, the process steps, and the participants provide sufficient artifacts to complete the introduction of the Organizational Cost Community Framework.

This Organizational Cost Community Framework will assist organizations exploring overlaps and gaps with respect to their cost community roles and responsibilities. Furthermore, this Organizational Cost Community Framework supports organizations seeking to improve the defensibility and sustainability of their cost estimation capabilities.

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