

Blueprint for a Project Management Office

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1 Introduction

As organizations turn to the project form as their preferred way to organize product development work, the need to coordinate the use of scarce resources and align initiatives becomes evident.

The Project Management Office (PMO) is the line organization that provides the infrastructure and competence necessary to manage projects. Its main responsibilities include: project portfolio management, capacity planning, scope management, inter-project coordination, overall project oversight, cost estimation, contingency planning, quality assurance, subcontract management, project managers' development, process management and tool support

The PMO objective, in contrast with those of a single project, is to complete all projects to best achieve the goals of the organization [1]. Its responsibilities include: project portfolio management, strategic resource planning, inter-project coordination, overall project oversight, cost estimation, contingency planning, quality assurance, external provisioning, project managers' development, process management and tool support.

The PMO is an operational function, not a policy making one. The PMO acts as an agent for senior management, providing advice, coordination and oversight and although accountable for the execution of the project portfolio, does not replace them nor the project sponsors concerning the prioritization of projects and their ultimate disposition.

In this chapter, we will identify the PMO main outputs, its process and interfaces, and the different competences or roles necessary to execute them. In subsequent chapters we will address in more detail the process definition, methods and tools necessary to deploy an effective PMO.

2 The Project Office Context

A PMO can be set-up at the Business Unit level, at the Product Unit level or wherever the need to coordinate multiple projects arises. Whatever the level within the organizational hierarchy at which the PMO is located, it is very important that the PMO Manager has direct access to the same management level as the resource owners. This will help maintain the PMO focused on the interests of the organization as a whole rather than on the interests of any particular functional group while assuring that the PMO manager has the authority and the access necessary to resolve the multiple conflicts that arise between projects competing for common resources. Figure 3-1, shows the proposed PMO reporting relationships.

The PMO interfaces, see Figure 3-2, with senior management, project sponsors, line managers, technical specialists, projects and third parties such as vendors and subcontractors.

Senior management constitutes the highest level of management within the organization to which the Project Office belongs. Senior management is responsible for formulating

strategies, has overall business responsibilities and provide the ultimate level for the resolution of conflicts. Common titles for senior management are director, vice-president, department head, etc.

Project sponsors, are those who order the project and have ultimate approval power over expenditures and deliverables. Depending on the business situation, these could be “paying customers”, sales representatives, product managers or any number of internal customers.

Line managers are the owners of the resources to be used in the execution of the project. They are in general responsible for a function or discipline within the organization. Common titles for line managers are department or section manager.

The technical disciplines entity represents the domain specialists to whom the PMO resorts, but which does not own, for performing trade-off studies or for specific information in their respective areas of specialization. These resources usually belong to the line functions.

Third parties are subcontractors, vendors and other external partners with which the projects are involved in commercial transactions.

In Figure 3-2, the execution of the projects is depicted external to the PMO to emphasize that the day to day decisions and the work of the project itself are outside the scope of control of the PMO; which only intervenes in case of issues that might affect other projects or to prevent irrecoverable deviations with respect to the plans. To do otherwise and involve the PMO in every single project decision would most likely result in the establishment of a grinding bureaucracy likely to kill any advantage that might be created by instituting a PMO.

The Project Office Information Structures: Master Plan, Resource Plan, Financial Forecast and Requirements Dependency Matrix.

The work of the PMO is organized around four fundamental information structures: the Master Plan, the Resource Plan, the Financial Forecast, see Figure 3-3 and the Requirements Dependency Matrix, see Figure 3.4.

The Master Plan is a time-scaled view of all the projects included in the project portfolio covering a planning horizon of two to three years. The projects in the plan are portrayed as single tasks characterized by their tentative start date, their duration, the effort required, their funding needs and their effort spending profiles. Additional information about the projects could include the degree of commitment to the project, i.e. whether the project is in execution, planned or envisioned, the status, i.e. whether the project is on-time, or delayed, for those under execution and the technologies or products they support. The Master Plan might also include relationships between projects and links to technology and product road maps.

The Resource Plan is a forecast, over the planning horizon, of the resources necessary to execute the projects included in the Master Plan. The Resource Plan covers the current availability of resources (headcount), their competencies, a recruiting plan and periods where excess capacity might exist. The resource plan shows whether the resource utilization is based on current, planned or envisioned work. At this level, the resource plan is prepared based on the competence of the resources and not by assigning specific individuals to the projects. Plans for resources such as test benches, laboratories and computing equipment are better taken care by the line organizations that own them.

The financial forecast depicts the cash flows, expenses and revenues, arising from the execution of the projects in the Master Plan with the purpose of helping senior management and project sponsors to choose the portfolio configuration that best meets the objectives and capabilities of the organization. The financial information contained in the forecast includes: labor costs, non-labor costs, management reserves, volume allowances and funding sources. In addition to the financial forecast, the PMO also prepares detailed quarterly or annual budgets for the projects in execution or about to start in the next budgeting period.

The Requirements Dependency Matrix is an important tool for organizations working on product lines or whose products evolve through successive reincarnations of added functionality. The matrix links the requirements or features to be developed in future projects to those in previous projects that will serve as a foundation upon which the latest will be built. The Requirements Dependency Matrix allows tracing the consequences of postponing or canceling the implementation of any feature through the entire project portfolio. Additionally, the matrix might contain financial and effort information that allows calculating the impact, in terms of lost revenues and extra development effort, that such decisions would have over subsequent projects. The mechanism for this will be explained in detail in Chapter 6.

3 PMO process

The processes a “manager” type of PMO performs revolve around three main themes:

- Project Life Cycle Management;
- Portfolio Management; and
- Support Functions.

Obviously the most important of all them, see Figure 3-5, the one that provides the justification for a heavy weight PMO like the one proposed here, is the Project Portfolio Management Process. If the organization does not adhere to the portfolio concept or if the portfolio is small, then all the organization probably need is a “repository” or a “coach” type of PMO, with the rest of the responsibilities shared between senior management and the line functions.

In deciding which processes to include under the responsibility of the PMO, there are two important criteria to consider: First, the PMO should be accountable and have authority over those processes that clearly fall under its area of responsibility, such as a project planning process. Second the PMO should have responsibility over those processes that will allow it to stay “in the loop”.

The justification for the second requirement is simple: in order to assure that the PMO has the necessary power to exercise its authority effectively and that is not by-passed when important decisions need to be made, alongside with the portfolio management process and the project management process, the PMO must also be given responsibility for the processes that materialize that power such as change management, vendor selection, career and professional development for project managers and budgeting.

Although the PMO must be given responsibility for the execution of these functions, it shall not be implied that the work to be performed is limited to the PMO staff. For example, formulating a project charter would require, beside the staff from the PMO, the

involvement of personnel from the sponsoring organization as well as specialists borrowed from the different technical disciplines. This is necessary not only because the PMO does not have all the technical resources needed, but because it helps develop consensus among the stakeholders. Another example is the portfolio planning process, where the PMO Manager acts as a convener and facilitator, with the final decisions taken by Senior Management in conjunction with the Project Sponsors.

3.1 Project Life Cycle Processes

The processes included in this category address the formulation, planning, execution termination and review of individual projects. See Figure 3-6.

3.1.1 Project Formulation

Upon receiving a request for a new project or a major change to an existing one, the PMO conducts a preliminary study to establish its scope, work approach, duration, effort required, and other business aspects. The extent of the work to be performed at this point is limited to that necessary to make an informed decision with regards to whether or not, include the request in the portfolio mix. See Figure 3-7.

To support this activity the PMO will typically set-up a multidisciplinary team with the participation of specialists from various departments and representatives of the sponsor.

The main output from this activity is a project charter, which specifies the scope of work, the time frame in which the work is to be performed, the effort and other resources necessary for the execution, the major risks that could derail the project and the connections to other projects in the portfolio. The project charter will be refined as work progresses.

Contingency costs are evaluated at this time with the purpose of minimizing costs by spreading the risks across all projects; much in the same way an insurance company will do across its policyholders.

3.1.2 Project Start-up

The project core team is assembled. The project scope, the initial estimates, the assumptions and the work approach proposed during the project formulation phase are revisited. Resource coverage is verified and necessary changes agreed with the project sponsor. Changes that might have an impact in other projects are submitted for review and approval in the context of the Master Plan. The WBS is refined, work packages defined and cost accounts set-up. A performance baseline, against which performance will be measured, is established. Project staffing and work is then started according to the project plan. See Figure 3-8.

It is during this phase, that the adaptation or tailoring of the organizational project management method and other processes to the circumstances and needs of the project takes place.

3.1.3 Project Execution

It is here, see Figure 3-9, where the actual project work gets done. The Project Execution Process brings together the resources from the line functions to work in a common goal and in accordance with the specifications contained in the project charter. The responsibility of the PMO is exercised through the project manager who is responsible for producing the stated results on-time and within budget, for encouraging team work and commitment and for ensuring that the processes, methods and standards of the organization in which the project is executed are adhered to.

3.1.4 Project closure

As the project draws to a close, the PMO must ensure that all the work is completed, that the people finalizing their assignments is taken care of, and that the lessons learned are incorporated into the project management processes.

The following are the key activities: finishing the work, transferring ownership of the deliverables, closing contracts with subcontractors and suppliers, debriefing the project team, conducting a lessons learning exercise, rewarding achievement and disbanding the project team. See Figure 3-10.

3.1.5 Project Audit

A project audit is an in-depth evaluation of the “true and fair” state of a project conducted by somebody that does not belong to the project team. A project audit has as its purpose one or more of the following:

- To ensure that the work is being performed in accordance with established procedures.
- To establish the real condition of a project in terms of time, quality, cost, scope, customer satisfaction and employee moral.

In order to gather data for the audit, the assessors will check work procedures, documentation and deliverables; conduct interviews with customers, employees and suppliers and conduct a root cause analysis. The findings of the audit are documented in an audit report for management follow-up. See Figure 3-11.

Insert Figure 3-11

3.1.6 Tollgate Reviews

Tollgates are standard decisions point in the life of the project. At each tollgate a decision on whether to continue with the project, to kill it or to do change it in some significant way is made. See Figure 3-12.

A project is reviewed as a minimum from three different angles. First the business one: Are the reason why this project was initiated still valid? Second: Is the project making the progress is supposed to make? Are solutions appearing faster than problems or vice versa? Third: Are the resources being used efficiently, meaning are we going to finish on-time within budget?

An effective tollgate process, one with the ability to discriminate between bad and good projects and with the willingness to terminate the losing ones, is a key discriminator between best in class organizations and the rest.

Insert Figure 3-12

3.2 Portfolio Management Process

The portfolio management process comprises: Portfolio Planning, Project Oversight and Portfolio Control. See Figure 3-13. The Portfolio Management Process seeks to maximize the benefits that can be attained with a given level of risk from all the projects the organization is currently undertaken and of those envisioned for the years to come.

3.2.1 Project Portfolio Planning

This is the point at which projects and business come together. The outcome of this process is a plan which balances the work, results, resources and risk according to the objectives of the organization. It involves deciding which projects to execute and when, forecasting the resources needed to execute the selected projects and predicting the resulting cash flows.

The Project Portfolio Planning process, see Figure 3-14, is performed at regular intervals, usually quarterly, or when special circumstances such as major deviations in individual projects, reorganizations or new opportunities impose a revision of existing plans. At this level, projects are viewed as a single task. The selection and prioritization of projects is made with the objective of striking a balance between criteria such as the projects' strategic position, probability of technical success, probability of commercial success, socio-political and regulatory consequences, costs, rewards, stage of innovation and resource constraints.

3.2.2 Project Oversight

The purpose of this activity is to provide foresight into the performance of individual projects so that management can act before local issues propagate to the entire portfolio.

The project's performance, see Figure 3-15, must be assessed against its performance baseline and against the output of forecasting models built out of measurements collected from previous endeavors. The output of the process is a prognosis of the project's health which includes, at least, the following check-ups: progress, cost, quality, and staff morale.

As there is not replacement for direct observation, the process must include spot checks of the actual work products and of the mood of the people working in the project to verify their congruence with what the quantitative indicators seem to signal.

3.2.3 Portfolio Control

This is the process by which the PMO takes action to compensate or minimize the impact of project deviations over the entire portfolio.

Estimates to complete are reviewed to ascertain that all projects will be completed in the allocated time frames, that resources will be freed on-time and that the impacts of cross project delays minimized. Appropriate corrective actions are decided on the context of the Master and Resource Plans and not on the basis of the affected project alone. See Figure 3-16.

The PMO Manager will take action by rebalancing the portfolio within the time-resource window defined for each project. Beyond those parameters, actions would need to be escalated to Senior Management for resolution.

3.3 Support Processes

The Support Processes provide the foundation on top of which all the processes operate, see Figure 3-17. Despite their low visibility, these processes are an essential component of the PMO, furthermore in the case of the PMO as a repository or as a coach, these are the only processes specifically assigned to it.

The importance of these processes reside in that it is through them, that the PMO can have a grip in what is really going-on in the projects without interfering with its work. For example by examining the activity logs of the Configuration Management system it is possible to determine the status of the work process or the number of changes requested by a sponsor but for this, it is necessary that the system be designed to provide this information. Similarly, if the training and evaluation of the project managers is not under the control of PMO it would be very difficult for the PMO Manager to exercise authority over them.

There are 8 fundamental support processes:

- Processes and Information Systems Management;
- Measurement Process;
- Change Management;
- Procurement Management;
- Quality Assurance;
- Administrative Support;
- Project Accounting; and
- Human Resources Management

3.3.1 Process and Information Systems Management

The success of the PMO relies on the existence of common processes and tools. Without them, the system is unmanageable. But as important as the role processes and tools play in developing a common vocabulary, is their value as intellectual capital and as a source of competitive advantage. They are the embodiment of the collective knowledge developed by the organization.

The notion of processes improvement embraced here is the one based on the notion of bottlenecks [2]. Bottlenecks are activities or mechanisms that limit the throughput of system along a given dimension: time to market, quality, etc. Improving in areas other than the bottleneck does not result in a performance increase at the system level. Of

course, once we have removed a given constraint something else will become a bottleneck and the process will be repeated again and again. By focusing the improvement work where it really matters, not only we reduce cost but we also minimize disturbance to the ongoing work, which in turn results in less variability. So by improving the improvement process we could achieve an improvement in the overall process.

Process and tools are improved based on information coming from industry, academia, experience gained from the execution of projects and from the inventive and insight of PMO personnel. See Figure 3-18.

3.3.2 Measurement Process

The Measurement Process comprises three activities, see Figure 3-19:

- Planning the measurements;
- Performing the measurements; and
- Producing performance statistics.

3.3.3 Change Management Process

Change and project work are inseparable. Change occurs naturally as part of the work that is done within the project, in response to changes in the business environment and to changes in the wishes and needs of the project sponsors.

Change management is a pervasive process that touches every aspect of the project work. Face to the Project Sponsor, it deals with changes to the project scope, within the project it deals with the evolution of the project's work products. Simply stated, the purpose of change management is to maintain: plans, contracts, requirements and specifications in a congruent state.

Change management involves three interrelated efforts, see Figure 3-20:

Requirements Management. The purpose of the requirements management process is to manage the requirements of the project's products and product components and to identify inconsistencies between those requirements and the project's plans and work products. Part of the management of requirements is to document requirements changes and rationale and maintain bi-directional traceability between source requirements and all product and product-component requirements [3].

Configuration Management (CM). The purpose of the CM process is to establish and maintain the integrity of project work products such as: products that are delivered to the customer, designated internal work products, acquired products, tools, and other items that are used in creating and describing these work products; and of organization work products such as standards, procedures, and reuse libraries. The CM process involves: Identifying the configuration of selected work products that compose the baselines at given points in time, controlling changes to configuration items, building or providing specifications to build work products from the configuration management system, maintaining the integrity of baselines and providing accurate status and current configuration data to developers, end users, and customers [3].

Communicate. The purpose of this effort is to assure that everybody is informed of the disposition and consequence of proposed changes

3.3.4 Procurement Management

The purpose of this activity is to support project managers in dealing with third parties, vendors or subcontractors, involved in their projects.

Procurement Management involves choosing the acquisition strategy, the selection of suppliers, the negotiation of contracts and the tracking and the auditing of third parties capabilities, performance and results. See Figure 3-21.

Insert Figure 3-21

3.3.5 Project Office Quality Assurance

This process concerns the schedule check of work products and work process employed by the projects and by the PMO. Do we do what we say? Do we observe our own procedures? Do we keep the documentation up to date?

The Quality Assurance function independently and objectively, see Figure 3-22:

- Evaluates that the quality of the work products is consistent with its specifications;
- Verifies that the work is performed according to the applicable process descriptions and standards;
- Provides feedback to project staff and managers on the results of the quality assurance activities; and
- Ensures that noncompliance issues are addressed

3.3.6 Project Office Administration

This process concerns the administration of the internal PMO work. Examples of this are requisition of personnel, travel arrangements, budget preparation, filing and communication, etc.

3.3.7 Project Accounting Process

Project accounting is the process of analyzing, recording and reporting all the financial events originated in a project.

The Project Accounting process consist of the following activities:

Validation. Validation is not the same as approval. The approval is an authorization to spend given by the project manager or the cost account responsible, while the validation is an action performed by the project controller or his delegate to verify that the expenditure conforms to organizational policies.

Transaction analysis. This is the process of deciding which account or accounts should be debited or credited and in what amounts.

Burden calculations. If applicable, a supplement called burden will be added to the base costs for invoicing purposes. Burden costs are calculated by multiplying a burden rate, which depends on the type of expenditure: labor, material, etc. by the base cost.

Invoicing. This is the task of generating invoices to the sponsor of the project. The invoicing procedure will depend on the type of contract and the modality of payment agreed between the sponsor and the performing organization.

Posting. Is the process of recording changes in the ledger accounts exactly as specified in the journal entries.

An important, but often neglected aspect of project accounting is the definition of account codes useful not only for financial reporting purposes, but for managerial reporting as well. For example, time reporting data could be used to determine when a product platform is reaching the end of its useful life by comparing the relative cost of extending its capabilities over successive generations of new products [4].

3.3.8 Human Resources Management

The PMO is responsible for identifying, acquiring and developing project management and project support personnel. In order to perform this function, the PMO needs to prepare job descriptions, training programs and work together with human resources in the establishment of appropriate career paths and rewarding mechanisms. See Figure 3-24.

The PMO develops the competence of its personnel through job rotation, formal training, self-development and mentoring and coaching programs.

4 Project Office Roles

The exact composition of the Project Office in terms of the number of personnel, their responsibility assignments, their expertise and whether there is a person for each role or a person wears several hats, depends on the number of projects in the project portfolio, the number of projects in execution at a given time, the projects' size and the type of PMO implemented. The responsibility assignments however cannot be totally arbitrary, accountability must go hand in hand with authority and involvement in the decision process.

Typical roles evolved out of the practice of project management are presented below.

4.1 Project Office Manager

The Project Office Manager is responsible for running the PMO and for the management of the project portfolio. Typical tasks include:

- Preparation and maintenance of the organization's Master and Resource Plans.
- Continuous evaluation of project performance to (1) allow the forecasting of future resource needs and (2) highlight areas of deviation where management action is required.
- Recruitment and evaluation of permanent and temporary staff for the Project Office.

- Participate in the project's planning sessions
- Prioritize efforts and resolve issues within area of responsibility
- Prepare budget, business cases, scenario analysis, contract reviews, and risk management strategies within area of responsibility
- Introduce new technologies and best practices for Project Management.
- Be a member of the projects steering groups;
- Be a mentor to high potential project managers;
- Coach members of the PMO in the application of the organization's defined processes, methods and guidelines;
- Coach members of the PMO on the use of the Organization's tools;
- Facilitate team meetings;
- Facilitate sales support;
- Audit projects for compliance with guidelines

The position of PMO Manager is a very important one. One that for its characteristics could be used as training ground for a promotion to the ranks of senior management. As such, beside the technical competencies and the experience necessary to perform, the individual to occupy the position must possess business acumen, have developed a network of contacts, takes initiative when required, understand the point of view of all project stakeholders and has a system thinking attitude.

4.2 Project Controller

The project controller is responsible for all project accounting and cost control within the PMO. Typically, the project controller will have two reporting lines: one to the PMO manager, the other to the organization's controller. More specifically, the project controller provides financial and accounting guidance to the PMO and the Project Managers; and ensures the integrity of the projects' budgets by controlling scope changes, fiscal changes, overhead allocations, and by flagging significant project overruns and underruns.

Typical responsibilities include:

- Challenge all inputs to assure their validity and appropriateness
- Authorize funds disbursements;
- Establish procedures for financial reporting;
- Prepare financial reports;
- Provide assistance and expertise related to the organization's financial system;
- Verify that all expenditures are properly recorded;
- Assist the project manager in developing the WBS structure to identify the tasks or project elements to be controlled;
- Establish account numbers for the projects;
- Assist Project Managers in the preparation of the project's budgets;

- Identify and report current and future deviations from budgets or other financial problems;
- Assist the Project Auditor in the conduct of project audits;
- Follow-up on contract payments

4.3 Project Auditor / Quality Assurance Personnel

The Project Auditor / Quality Assurance Personnel is responsible for verifying the state of the project based on objective evidence, performing quality assurance tasks and assessing third party quality systems.

- Conduct interviews;
- Analyze project deliverables;
- Analyze project data;
- Prepare reports;
- Participate in stage-gate decisions;
- Define opportunities for improvement;
- Conduct root cause analysis;
- Write and maintain the projects' quality plan;
- Develop, adapt and/or tailor development processes;
- Develop, adapt and/or tailor development methods;
- Develop, adapt and/or tailor naming conventions and style guidelines;
- Coach members of the team in the application of the project's processes, methods and guidelines;
- Facilitate team meetings;
- Promote process adherence;
- Audit products for compliance with guidelines;
- Write action items concerning risks and non-conformances with the prescribed guidelines;
- Collect project's metrics;
- Report project's metrics

4.4 Project Manager

Plans and executes the project on behalf of the project sponsor. To do this, the Project Manager must coordinate and integrate activities across multiple functional lines. Typical responsibilities include:

- Performing key planning work and giving adequate direction to those performing detailed planning;
- Review contracts and proposals;
- Assure that all goals, plans and schedules are consistent;

- Establish and maintain effective control of the project work and expenses;
- Issues work guidance;
- Leads the team;
- Promotes a healthy working environment;
- Interface with the project sponsor;
- Interface with the customer;
- Interface with third parties (suppliers and subcontractors);
- Monitors results to assure that specifications and contract conditions are being met by all parties (e.g. customer payments);
- Controls changes in the scope of work;
- Participates in risk/opportunity studies;
- Participates in trade-off agreements;
- Authorize project payments/expenditures;
- Approves project reports;

4.5 Project Coordinators

The project coordinator assists the Project Manager in the administration of the project. This position will usually exist only in medium to large projects where the administrative load would distract the project manager from his primary role, or where the organization uses an apprenticeship approach to develop project management competencies. Typical responsibilities include:

- Prepare and maintain the project schedule;
- Prepare and maintain all the project's correspondence;
- Prepare and maintain the project's library;
- Prepare and release, on approval of the Project Manager, work authorization documents;
- Maintenance of the project ledgers, verification of invoices and their correct holdback, invoice coding and allocation.
- Obtain periodic progress reports from all responsible managers;
- Record the minutes of the project review meetings;
- Follow-up on action items.

4.6 Configuration Management Personnel

Configuration Management personnel is responsible for the documenting, monitoring, evaluating, controlling, approving and communicating all changes made to project charters, the Requirements Dependency Matrix and any other information shared by more than one individual or organization. Typical responsibilities include:

- Organize and facilitate Configuration Control Board meetings;

- Develop, adapt and/or tailor the project's Change Management processes;
- Conduct configurations audit;
- Enter and maintain meta-data for Configuration Items;
- Receive Engineering Change Proposals

5 Relationships between the Project Office, the Line Functions, the Project Sponsors and other Project Stakeholders

Whatever the preferred distribution of responsibility between the PMO and other project stakeholders is, it is important that none of the tasks falls through the cracks and that everybody understands what is expected from him or her in order to minimize conflicts. An excellent vehicle to achieve this, is the responsibility matrix [5] which provides, in a very compact form, an unequivocal definition of the authority and responsibility of all the project's stakeholders: sponsor, project manager, line managers, etc. See Table 3-1.

The matrix' rows have two different meanings. The rows that contain the process name (the darker ones) are used to indicate overall responsibility for the process while the rows subordinate to them (the lighter ones) indicate authority for particular decisions that need to be made as part of the process.

Table 3-1 describes an allocation suitable for a "Manager" type of PMO. Other distribution would lead to different types of PMO.

Table 3-1 Responsibility Matrix

	Sr. Managers	Project Sponsor	Line Managers	Project Office Mgr.	Project Manager	Project Office Specialists	Technical Disciplines
Project Formulation				O			
Set project goals		AE			I	I	I
Set project requirements		A			I	I	E
Prepare project schedule		A			E	I	I
Prepare project budget		A			E	I	I
Determine required quality		AE			I	I	I
Determine revenue dependencies		AE			I	I	I
Determine technical dependencies		I			I	I	AE
Determine solution approach		A			A	I	AE
Project Start-up				O			
Appoints project manager		A		A			
Modify project requirements	A	AWL		AWL	AWL	I	E
Modify project budget	A	AWL		AWL	AWLE	I	I
Modify project schedule	A	I		AWL	E	I	I
Modify manning plan		I	A	AWL	AWLE	I	I
Select team members			AE	I	I	I	
Select engineering tools			A		I	I	E
Select development methods			A		I	I	E
Make/buy decisions		A			AWL	I	AWLE
Project Execution				O			
Interface with sponsor/customer					E		
Interface with line managers					E		
Modify project requirements	A	AWL		AWL	AWL	I	E
Modify project budget	A	AWL		AWL	AWLE	I	I
Modify project schedule	A	I		AWL	E	I	I
Modify manning plan		I	A	AWL	AWLE	I	I
Remove team member			A		A		
Authorize the use of overtime	A			AWL	AWL		
Authorize travel					A		
Authorize purchases					A		
Approve payments					A		
Project Closure				O			
Hand-over deliverables					A		
Evaluate team member performance			A		E		
Approve lessons learned		I			A	I	I
Grant rewards		I	A		A		I
Conduct Tollgate Review				O			
Evaluate business reality		E			I	I	I
Evaluate project progress		E		I	I		I
Evaluate resource usage		E	I	I	I		I
Approve tollgate		A	I	I	I		I
Project Portfolio Planning				O			
Cancel project	A	I	I	I	I		I
Accepts new projects	A	I	I	I			
Decide growth strategy (hire, outsource, hold, downsize)	A	I	E	I			

Prioritize projects	A	I	I	I			
Resolve escalated issues	AE	I	I	I	I		I
Project Oversight				O			
Orders spot check				A	I	E	I
Approves project diagnostic				AE	I	I	I
Portfolio Control				O			
Authorizes the use of more resources			A	AWL	I		I
Authorizes a schedule extension	A	I	I	AWL	I		I
Authorize the use of reserve funds				A	I		I
Orders a project audit		I		A	I	E	I
Procurement Management				O			
Select sourcing strategy	A	I	I		I	E	I
Select contractors	A	I	I		I	AWLE	I
Select vendors	A	I	I		I	AWLE	I
Negotiate	A	I			I	AWLE	I
Human Resources Management				O			
Recruit PMO staff	A			AWL		E	
Evaluate performance of PMO staff	A			AWL		E	
Promote PMO staff	A			AWL		E	
Terminate PMO staff	A			AWL		E	
Project Audit				O			
Process & Information Systems Management				O			
Measurement Process				O			
Change Management				O			
Quality Assurance				O			
Administrative Support				O			
Project Accounting				O			
Legend:							
O – Owns process, is responsible for its execution.							
A – Approves, is accountable for. More than one A in a row means that it must be agreement.							
AWL – Approves Within Limits, if the magnitude of the decision is outside limits it is referred to A.							
I – Input, provides information.							
E – Executes, does the actual work.							

6 Summary

This article introduced the processes necessary to coordinate and support the work done through projects and assigned responsibility for them to a new line function called the Project Management Office (PMO).

In practice this framework, like any other framework, must be tailored to the needs and culture of the organization in which is going to be deployed; this can be done through the use of a responsibility matrix in which the key decisions that must be made through the life of a project are listed and responsibility for them assigned to the different stakeholders.

For additional details refer to the book of the same author: “Running the Successful Hi-Tech Project Office” published by Artech House in March 2003.

7 Author Biography & Contact Information

Mr. Miranda is a professional with twenty years of experience in R&D management in the aerospace and telecommunications industries. Currently Mr. Miranda is working in the development of new estimation and planning approaches for R&D projects. Mr. Miranda is affiliated with the Université du Québec à Montréal as an Industrial Researcher.

Mr. Miranda holds a Master of Engineering degree from the University of Ottawa and a Master degree in Project Management from the University of Linköping. Mr. Miranda has published over ten papers in software development methodologies, estimation and project management and is the author of the book "Running the Successful Hi-Tech Project Office" published by Artech House in March 2003.

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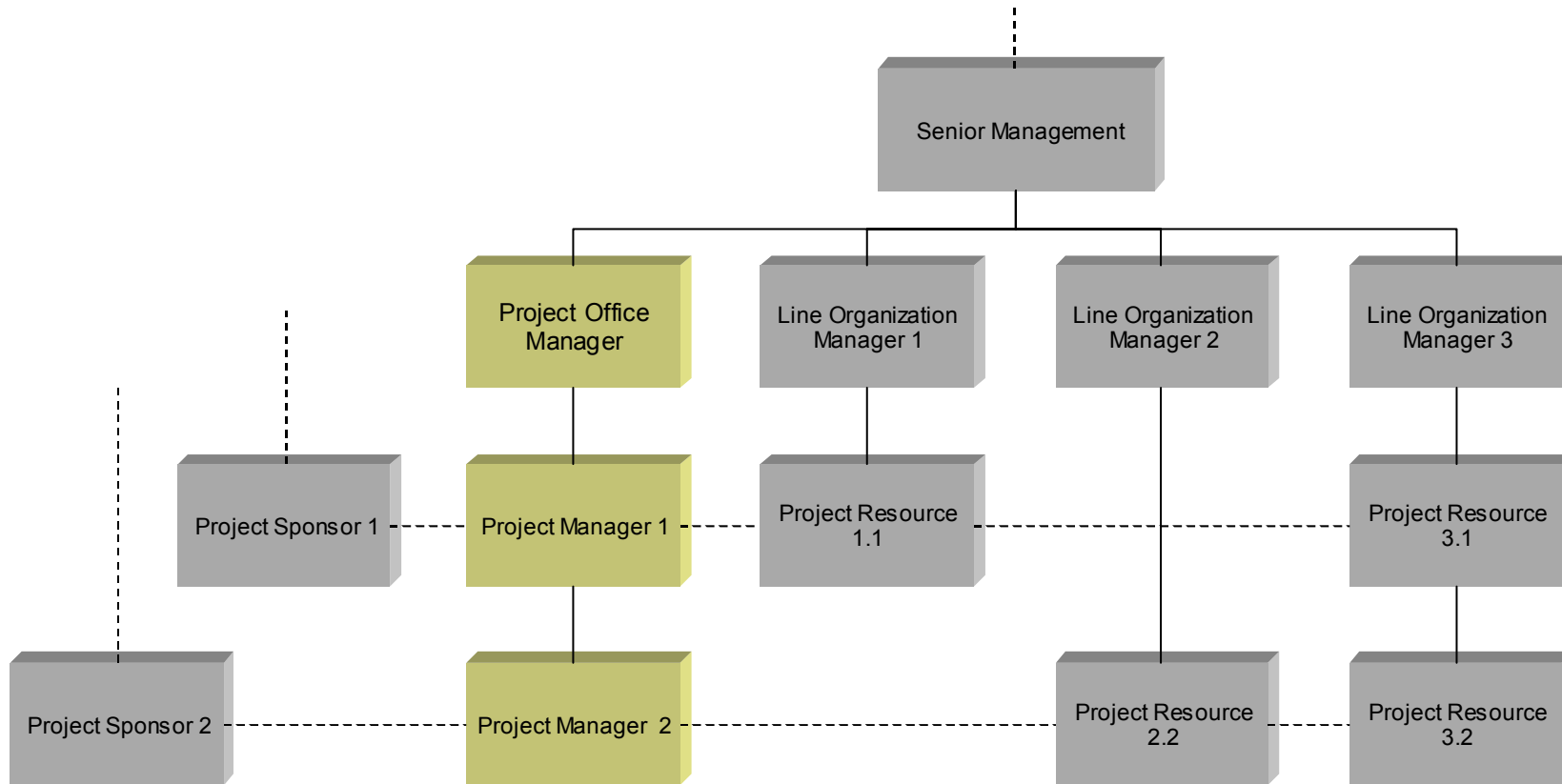


Figure 3-1 - Reporting relationships

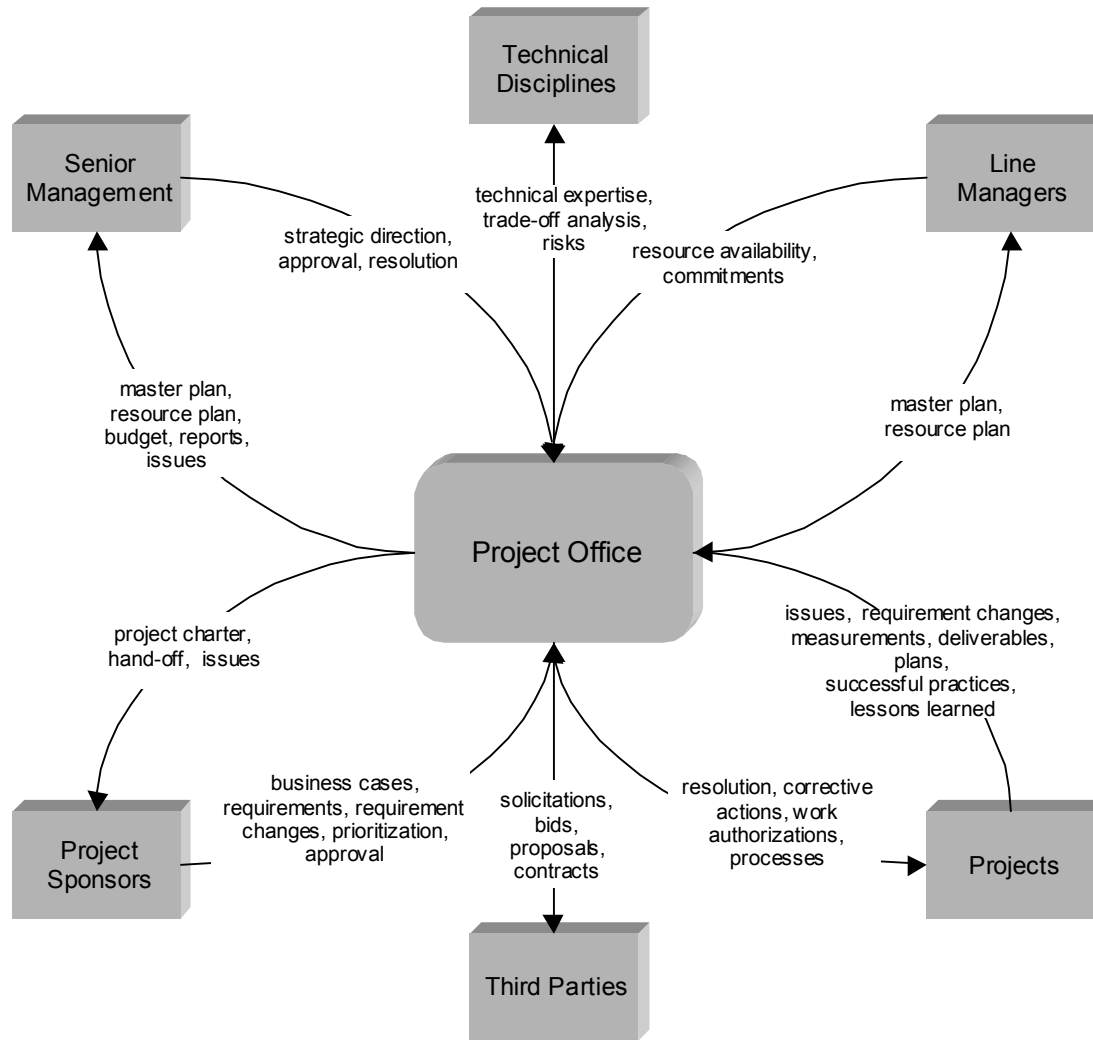


Figure 3-2 - The Project Office context

Projects	Where used	Project 1	Project 1	Project 2	Project 2	...	Project 2	...	Project n
Where developed	Requirements	Feature 1-1	Feature 1-2	Feature 2-1	Feature 2-2		Feature 2-n		Feature n-1
Project 1	Feature 1-1			▲		▲			▲
Project 1	Feature 1-2			▲			▲		
Project 2	Feature 2-1								
Project 2	Feature 2-2								
⋮							▲		
Project 2	Feature 2-n								▲
⋮									
Project n	Feature n-1								

Feature $n-1$ in Project n requires the implementation of Features $1-1$ and $2-n$ by projects 1 and 2 respectively. Feature $2-n$ requires Feature $1-2$ to be developed by Project 1 . Therefore, if Feature $1-2$ is dropped from Project 1 , Project 2 and Project n will be impacted.

Figure 3-4 Requirements Dependency Matrix

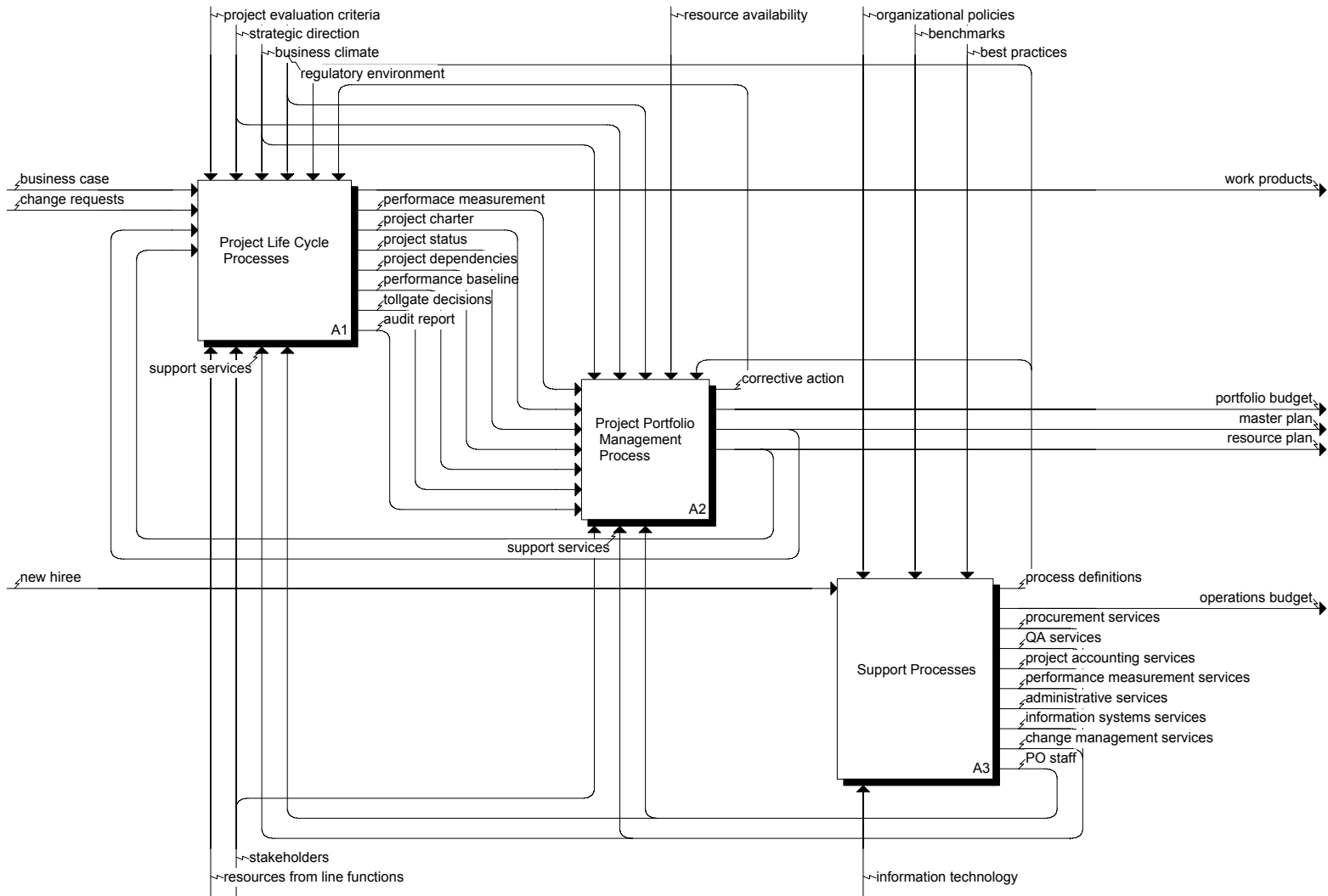


Figure 3-5 Project Office Main Processes

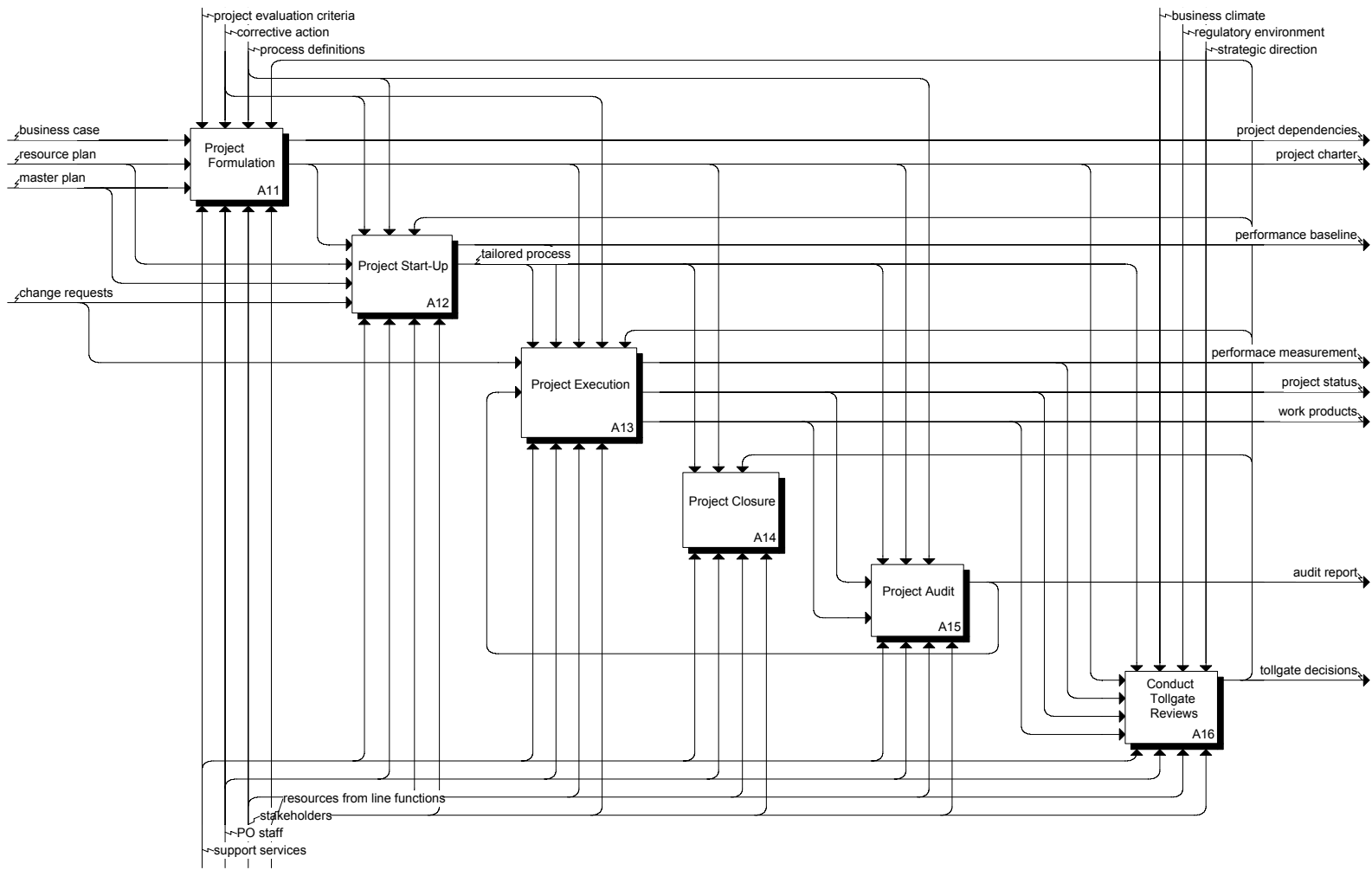


Figure 3-6 Project Life Cycle Processes

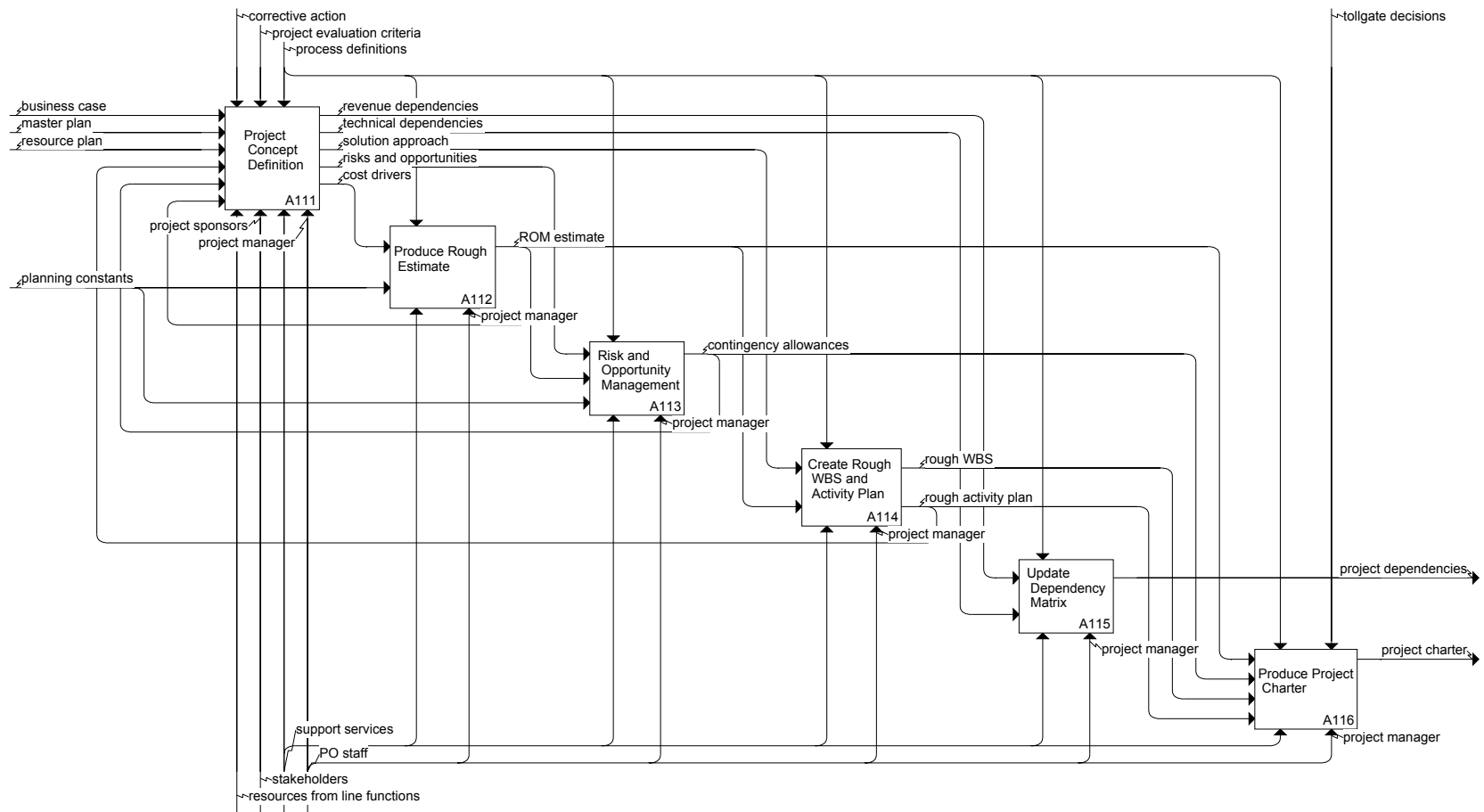


Figure 3-7 Project Formulation Process

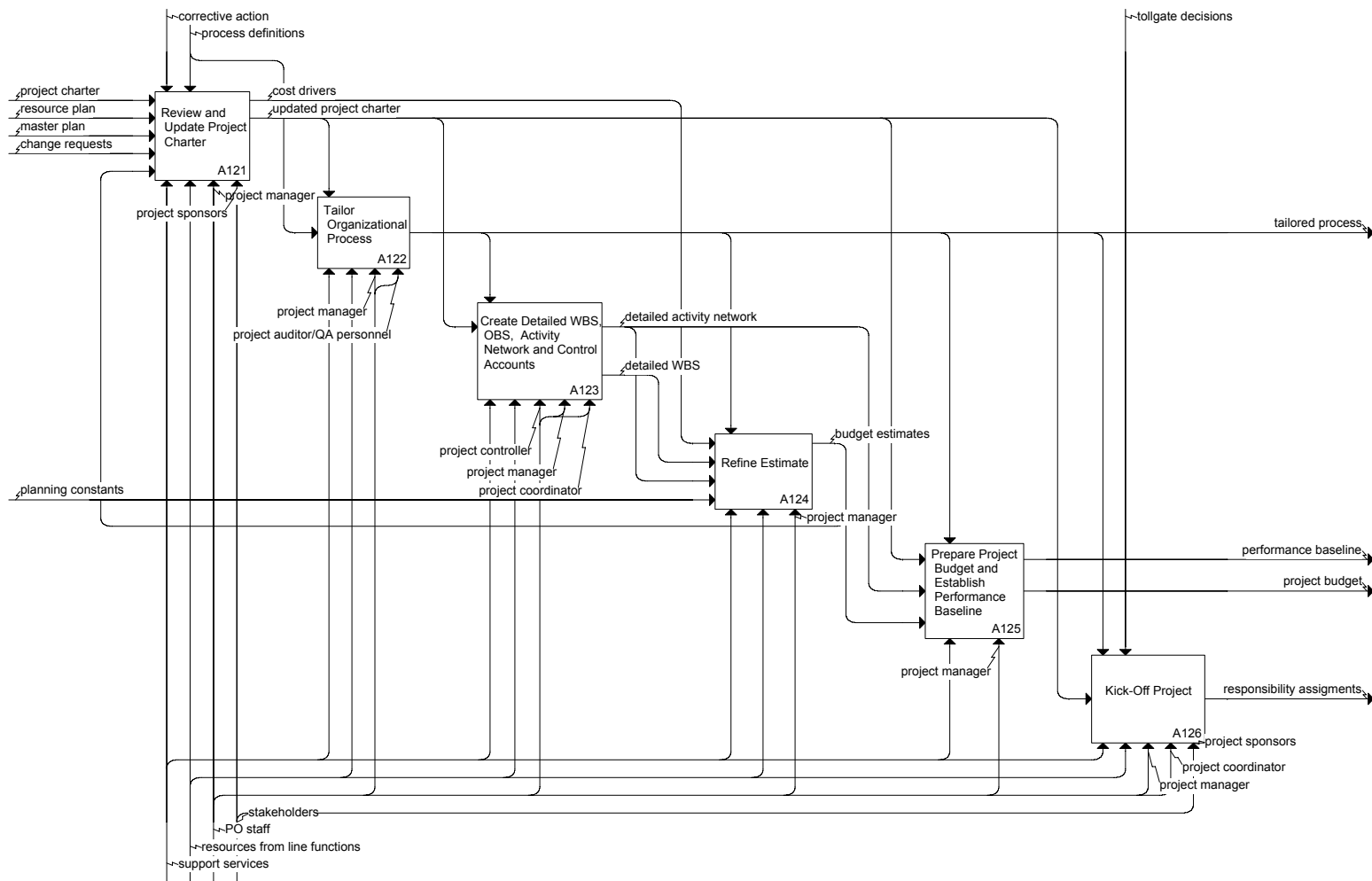


Figure 3-8 Project Start-Up Process

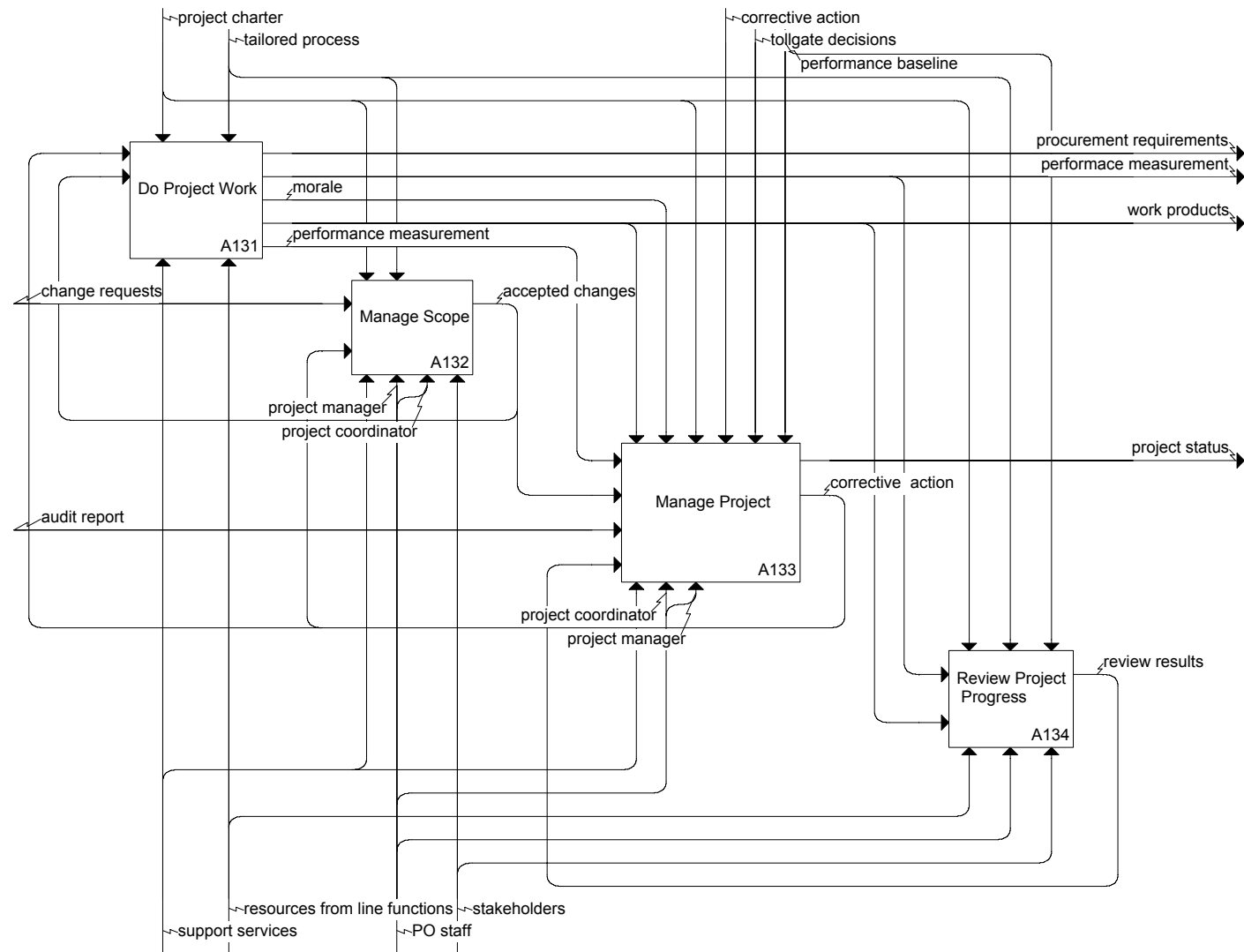


Figure 3-9 Project Execution Process

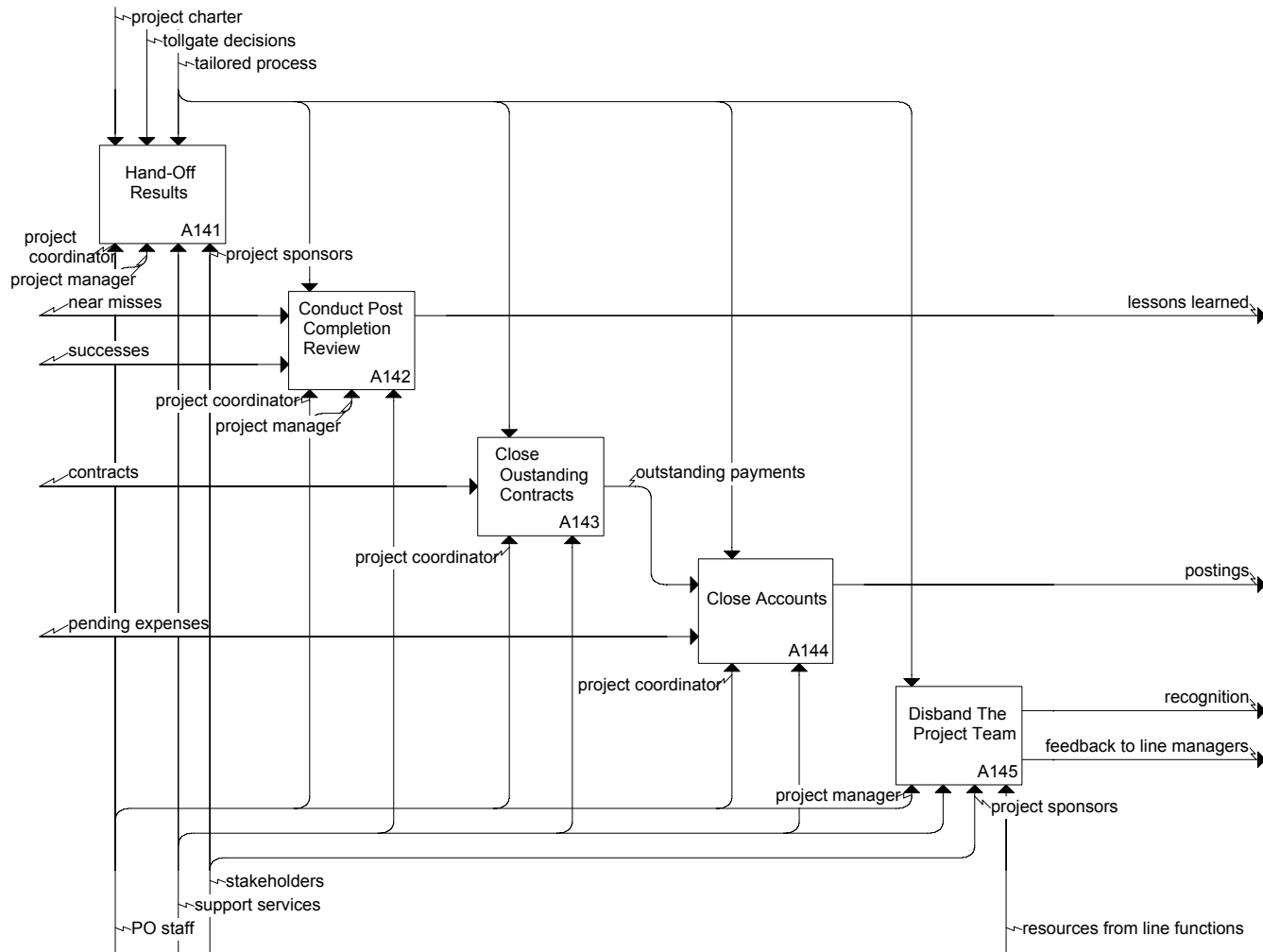


Figure 3-10 Project Closure Process

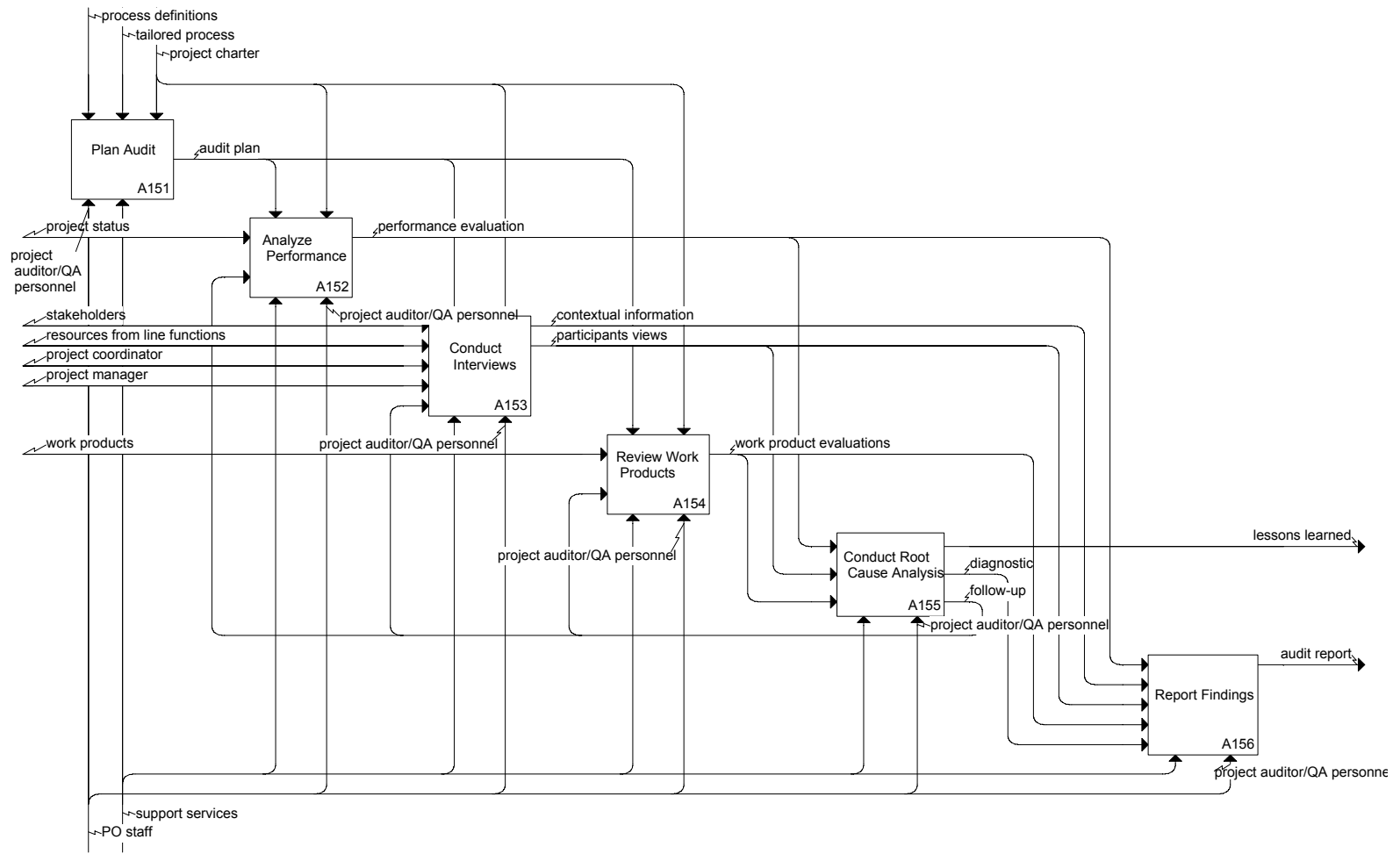


Figure 3-11 Project Audit Process

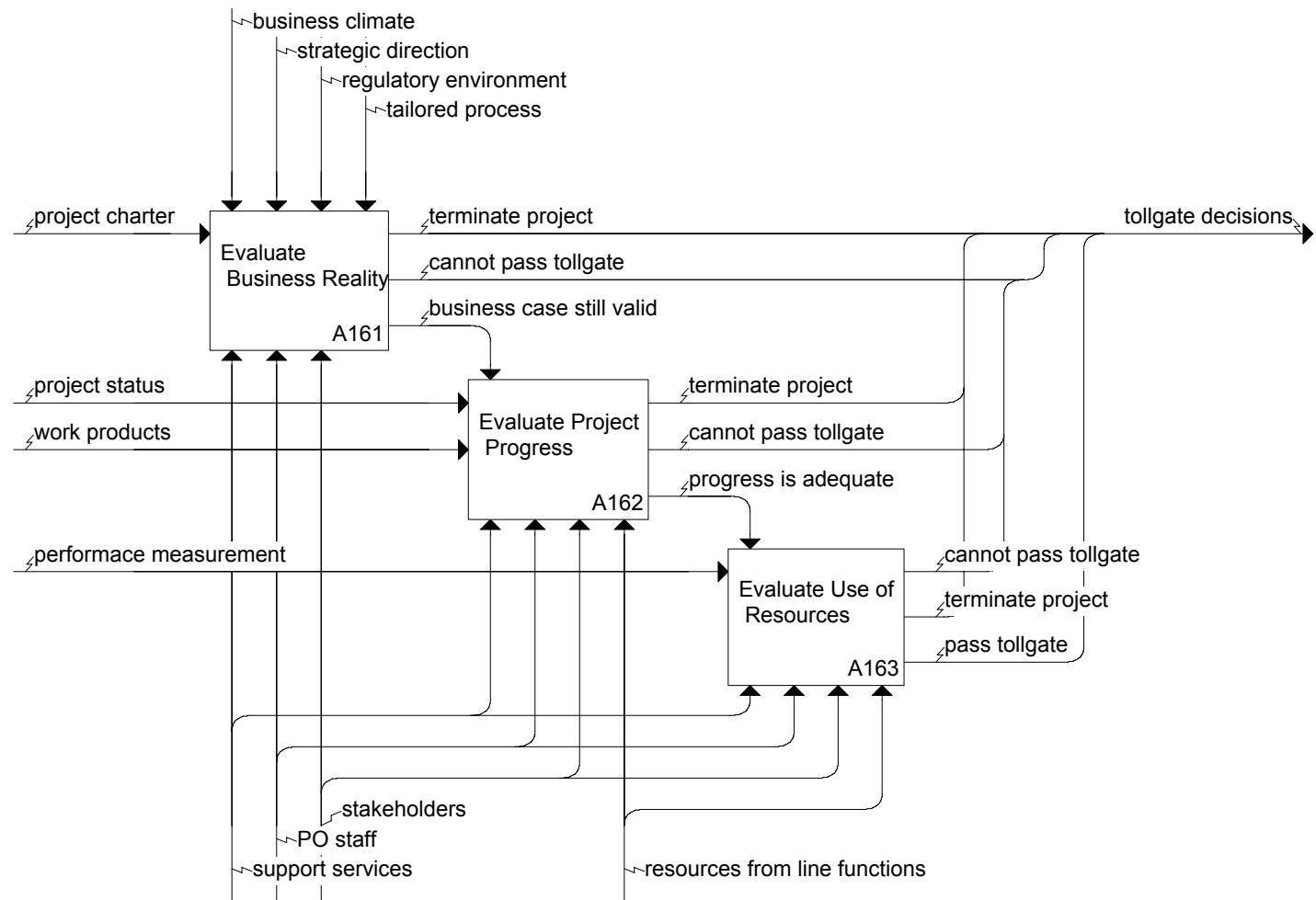


Figure 3-12 Tollgate Process

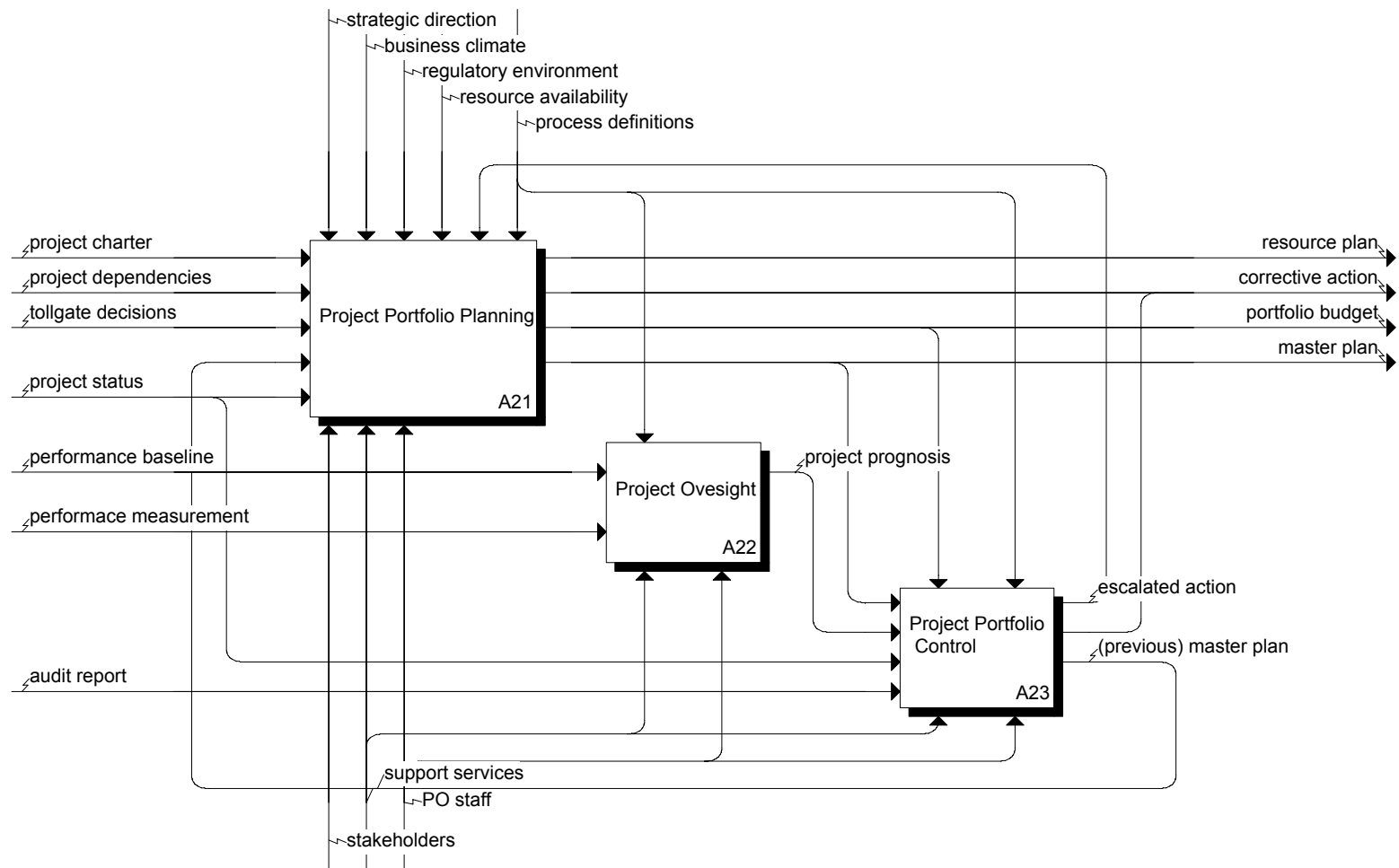


Figure 3-13 Portfolio Management Processes

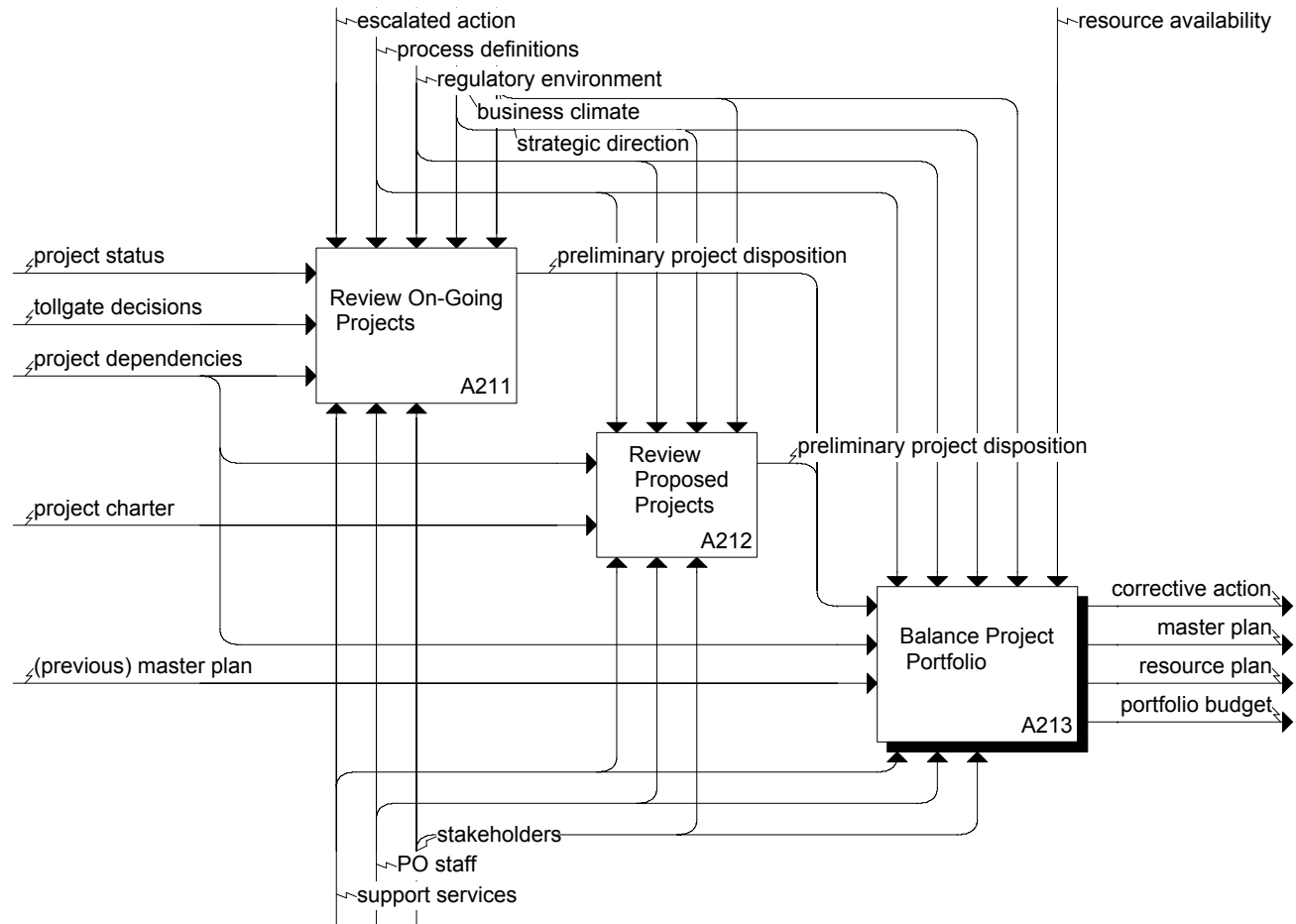


Figure 3-14 Project Portfolio Planning

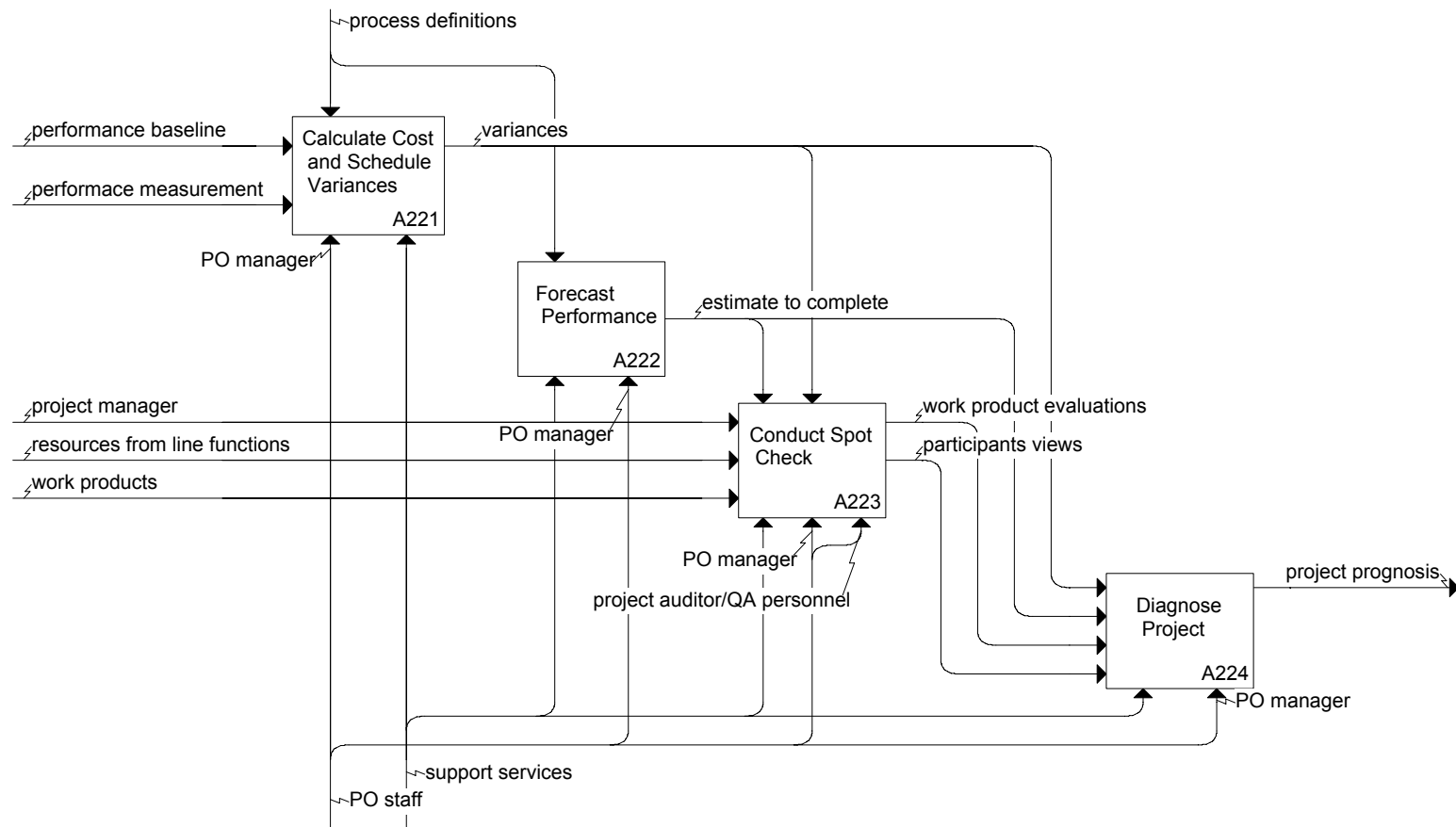


Figure 3-15 Project Oversight

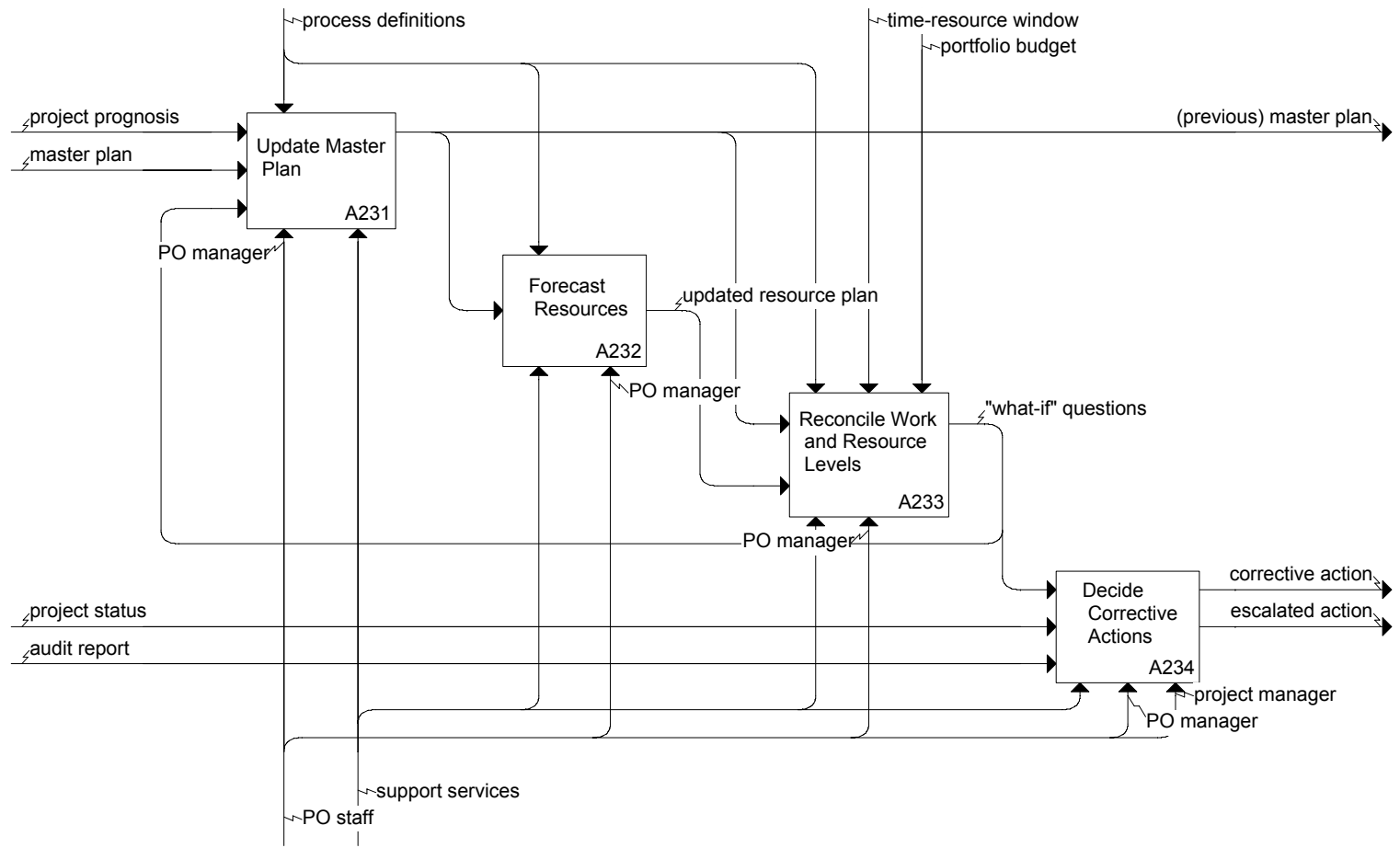


Figure 3-16 Portfolio Control Process

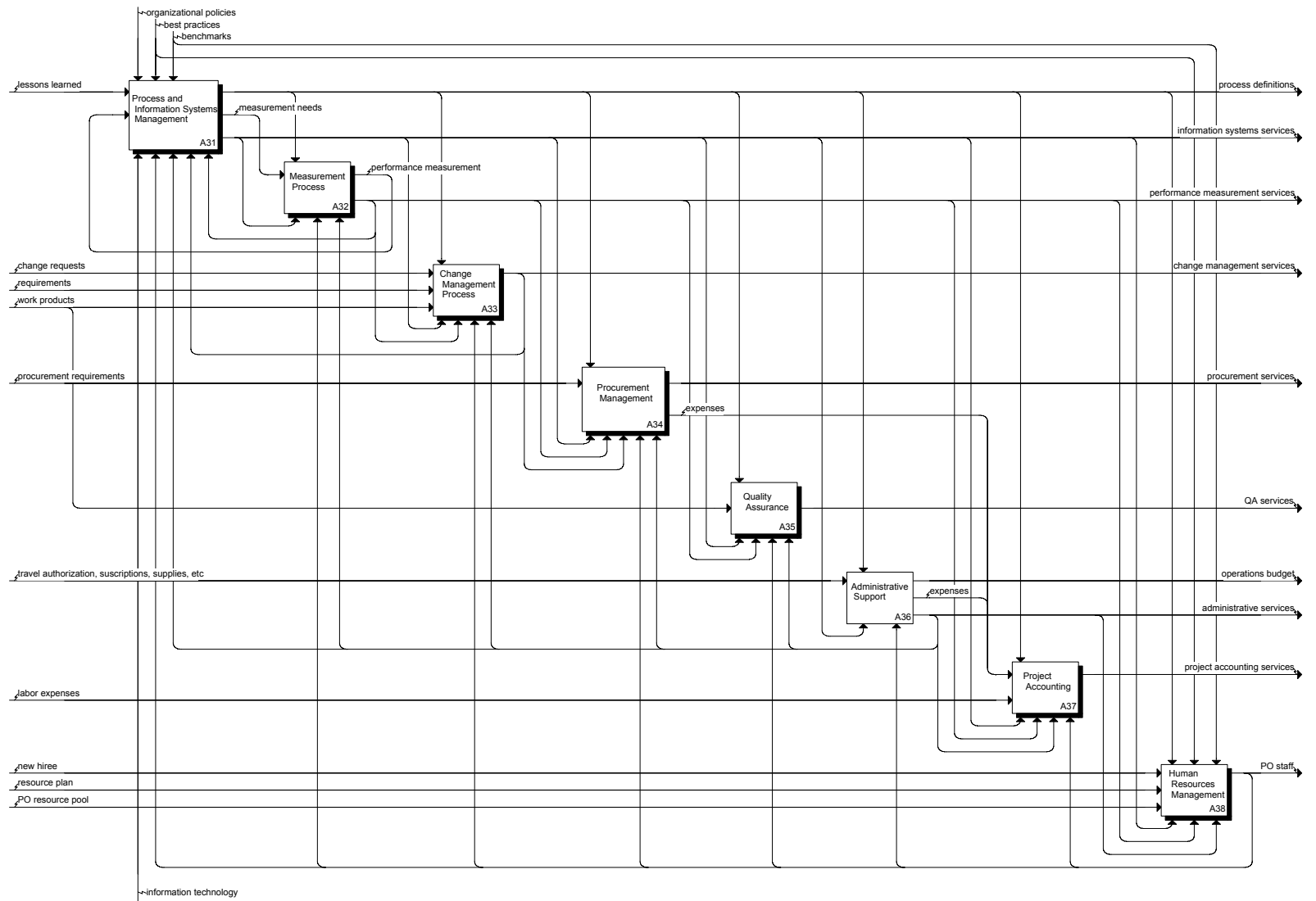


Figure 3-17 Support Processes

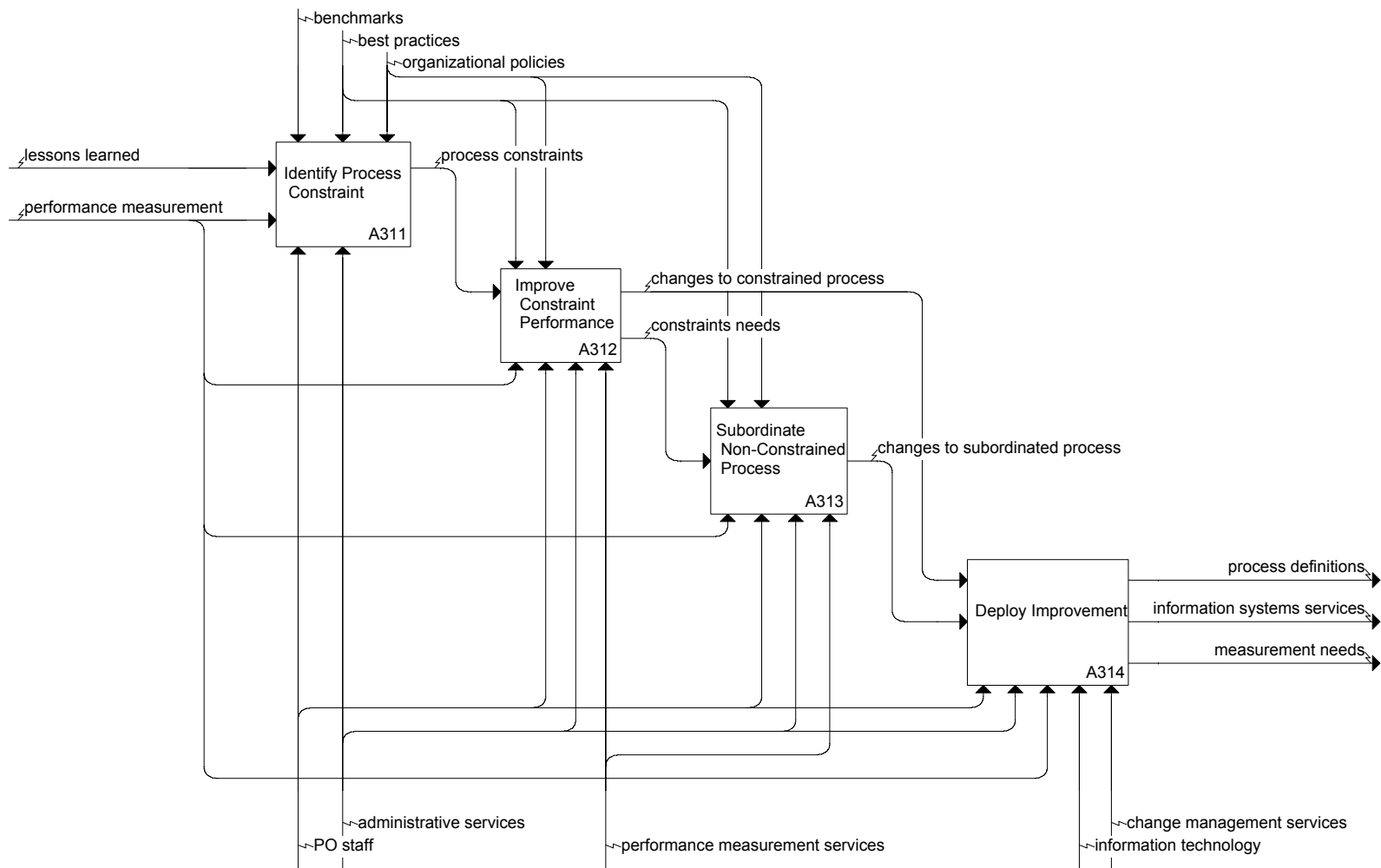


Figure 3-18 Process and Information Systems Management

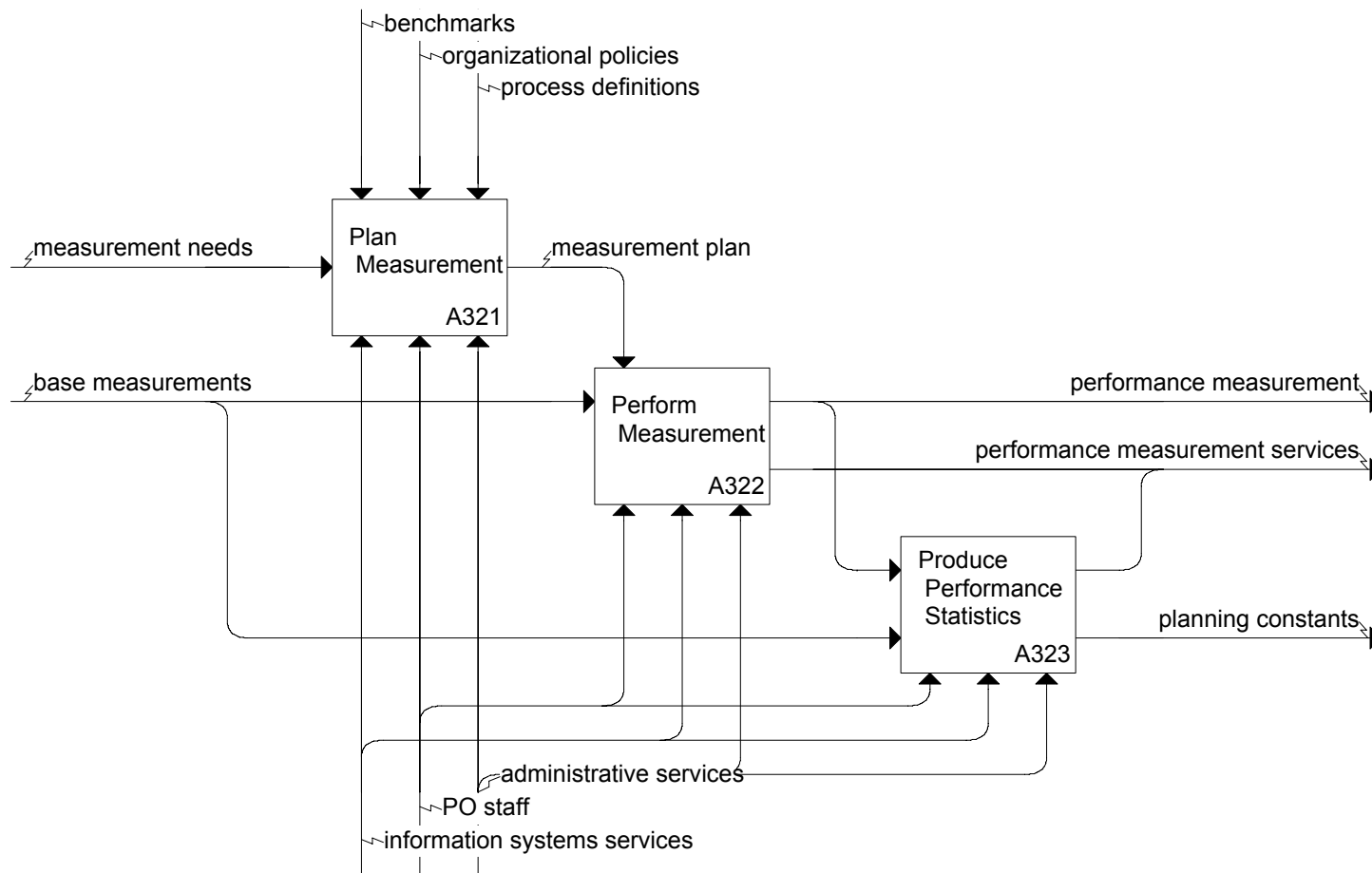


Figure 3-19 Measurement Process

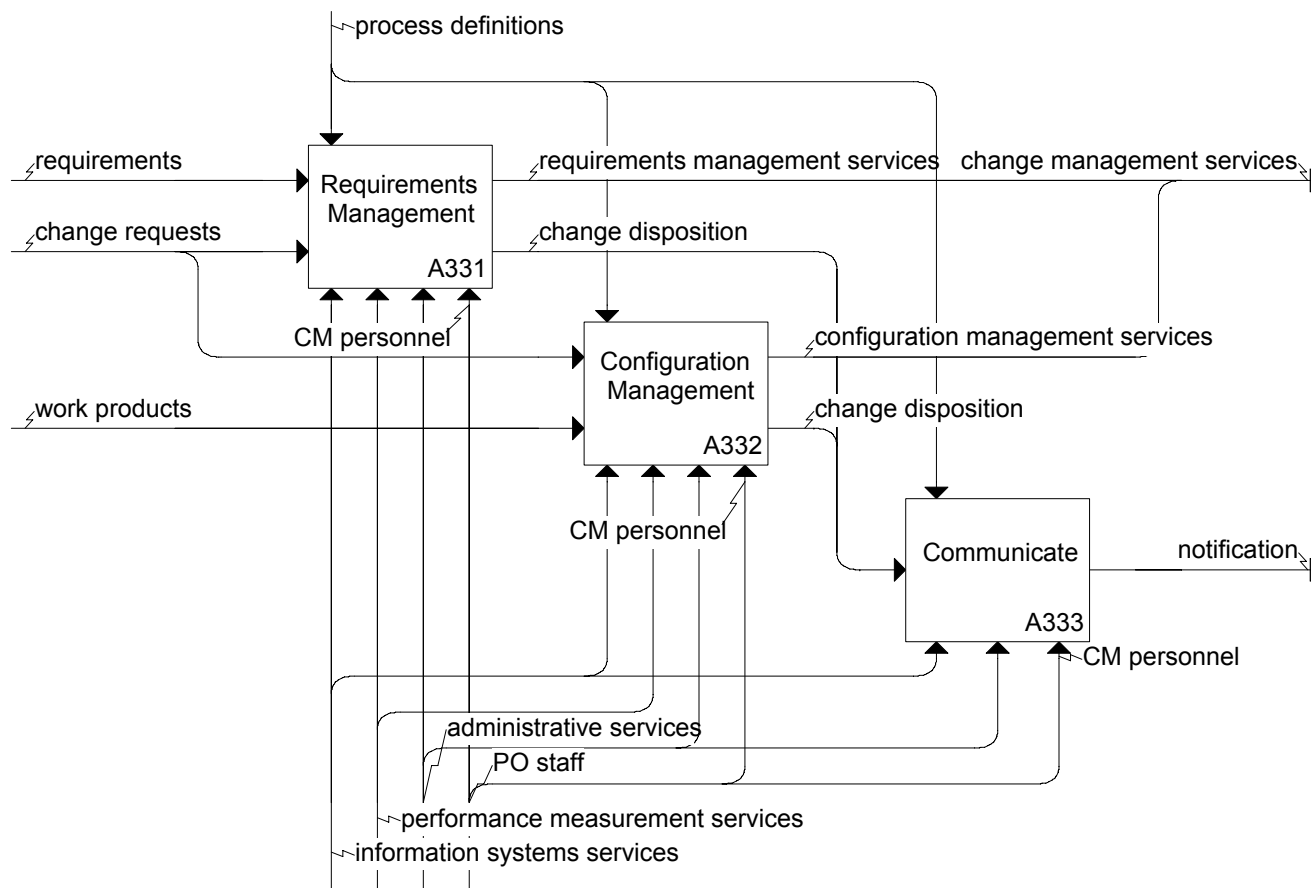


Figure 3-20 Change Management Process

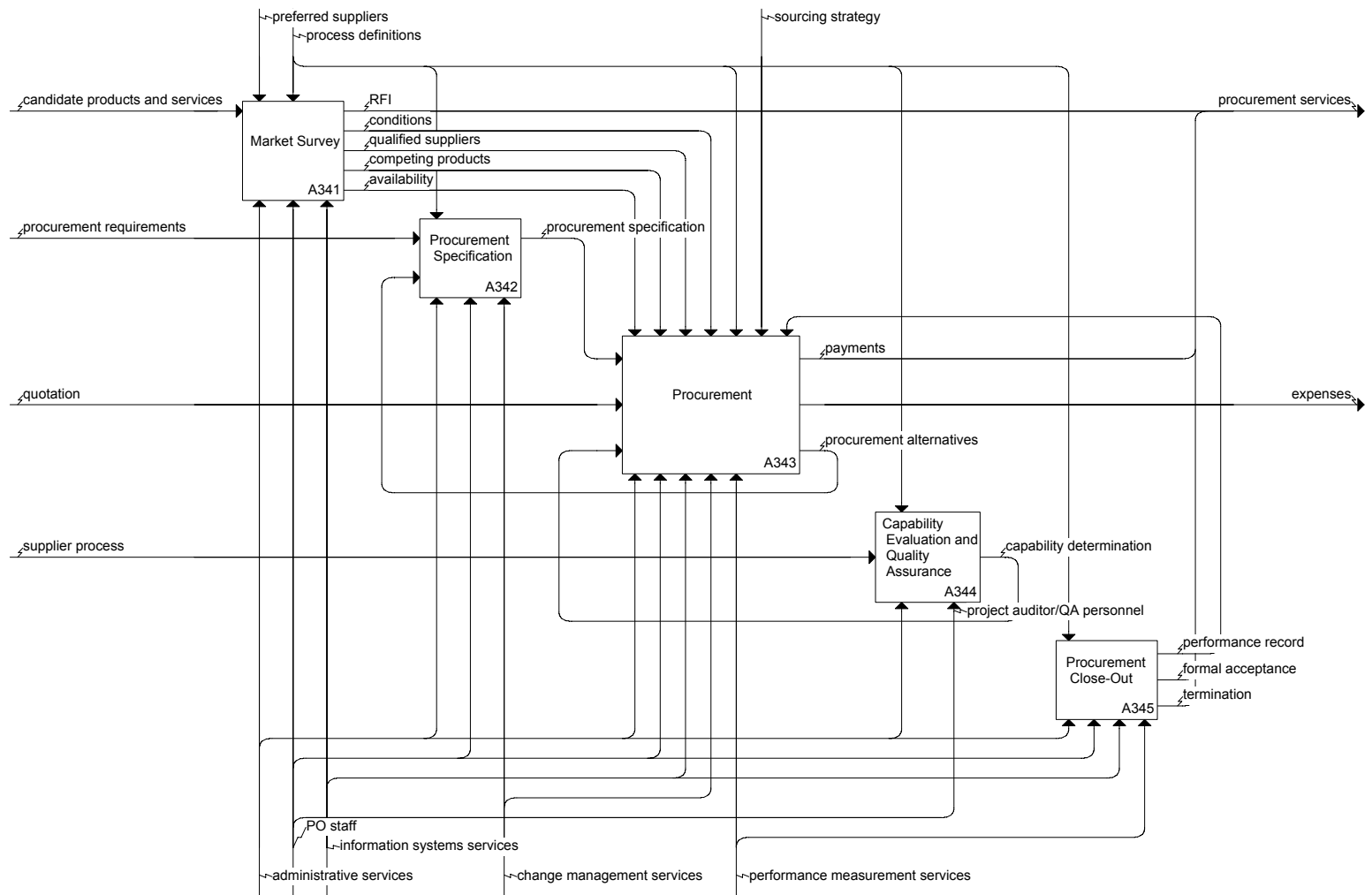


Figure 3-21 Procurement Management Process

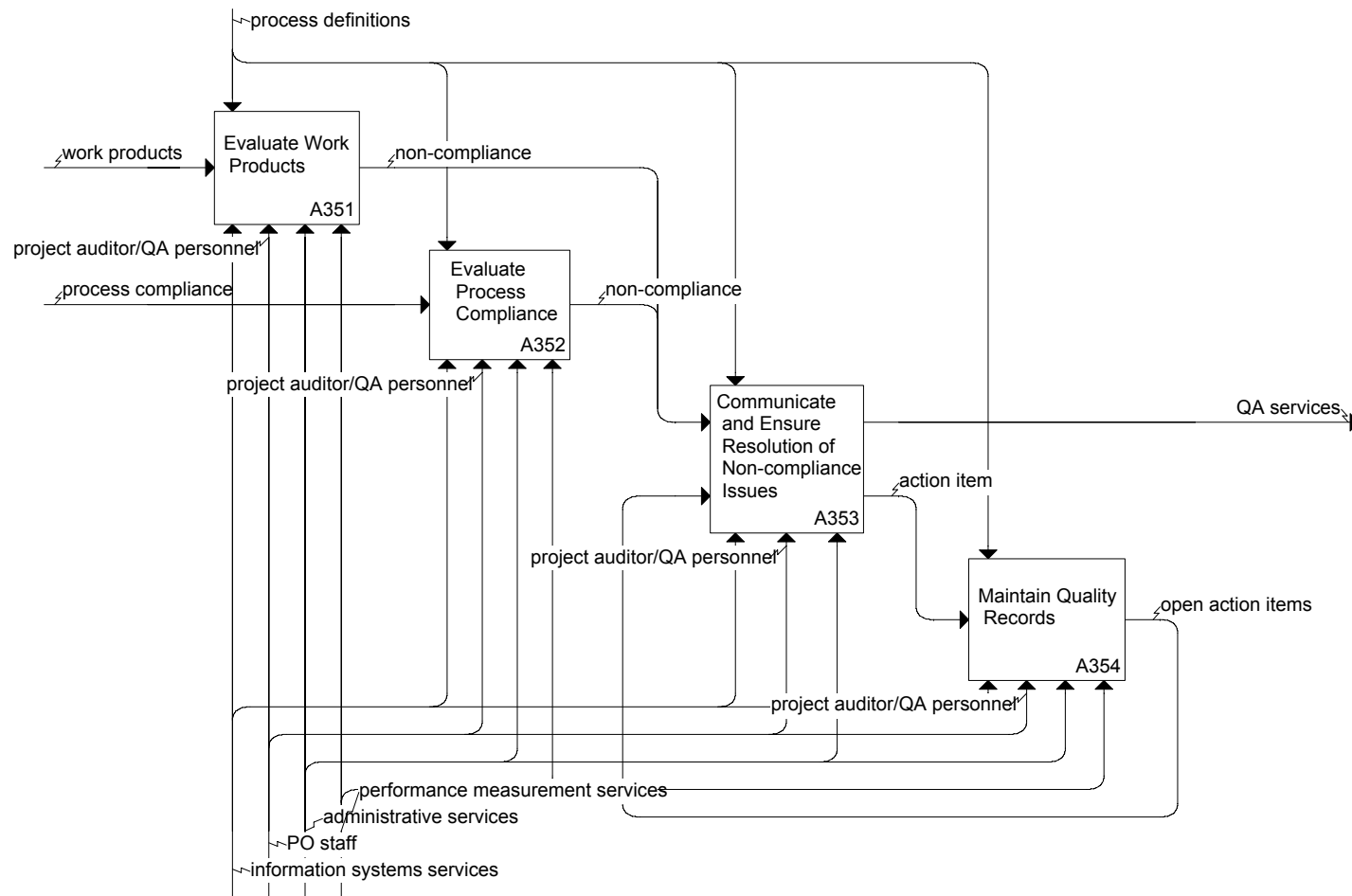


Figure 3-22 Quality Assurance Process

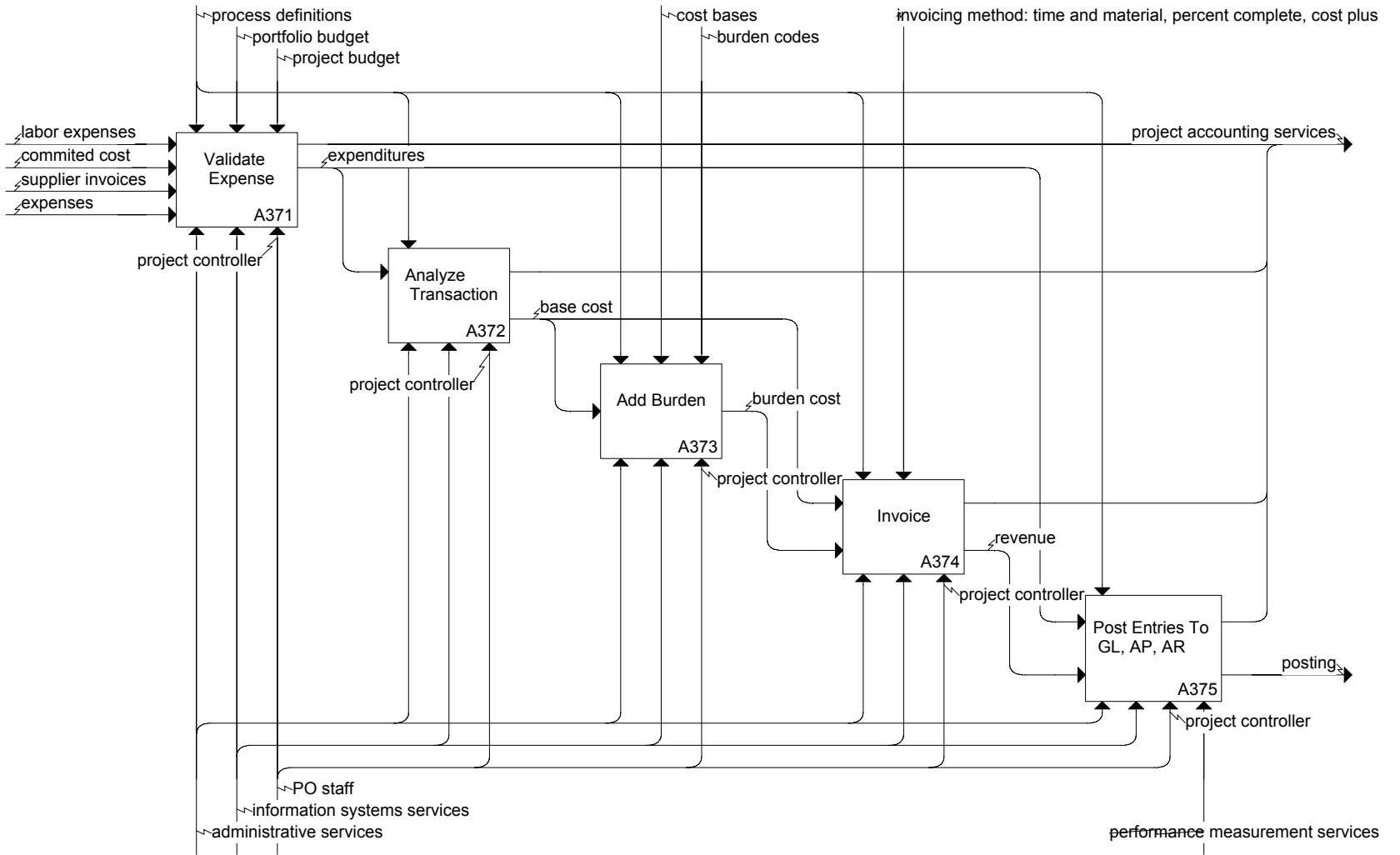


Figure 3-23 Project Accounting Process

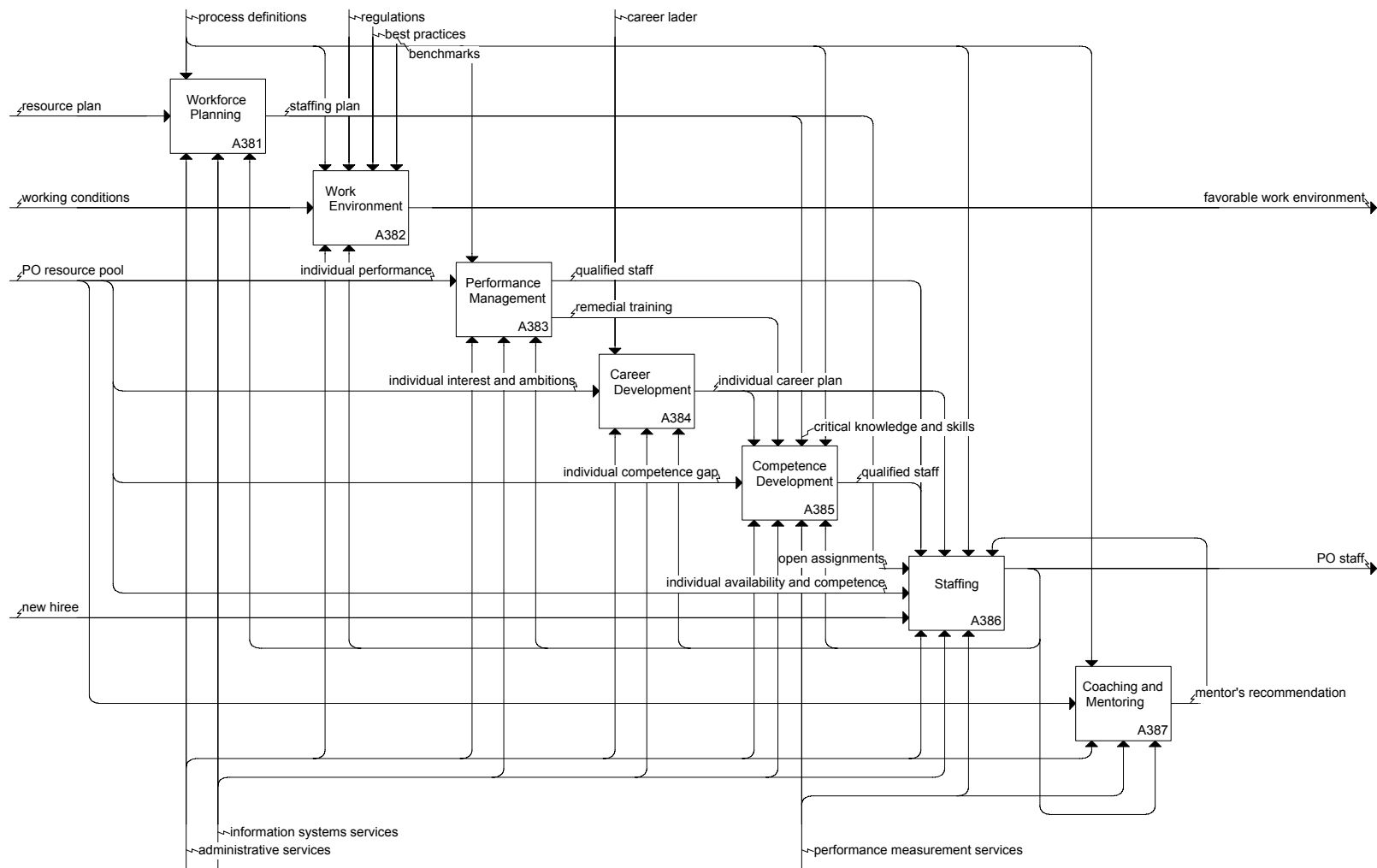


Figure 3-24 Human Resources Management Process

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 - 3 Capability Maturity Model Integration for Systems Engineering and Software Engineering (CMMISM) Version 1.1, Software Engineering Institute, 2001
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