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Application Portfolio Management for Aligning Information Technology and Operational Technology

Challenge and Opportunity for Utilities

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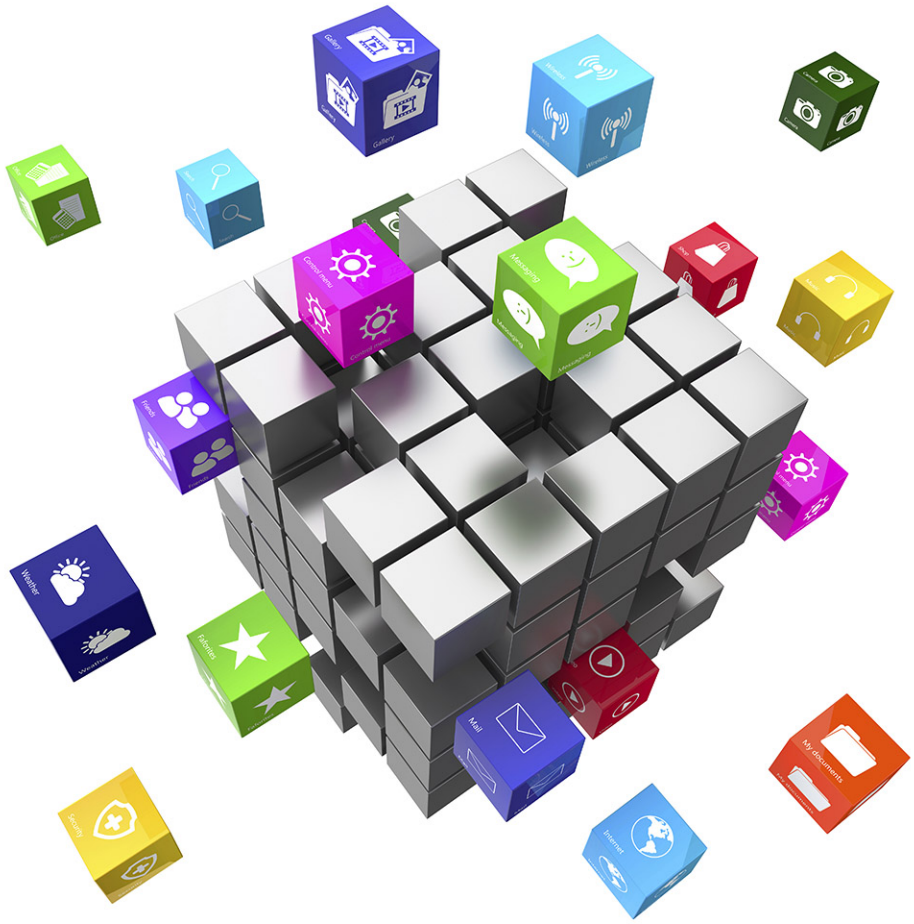

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ABSTRACT

A utility's collection of software applications represents both a significant investment and an ongoing expense. Maximizing the value that the utility realizes from these expenses is done through a discipline often referred to as *Application Portfolio Management* (APM). As the name suggests, APM deals with *applications:* software items that directly support the business functions of the utility. Second, APM treats the applications as a *portfolio:* a group of assets that is managed not as random, independent pieces, but as an interconnected and synergistic assemblage of parts that together empower the utility's business processes. Finally, APM is about *management:* taking actions that modify the contents of the portfolio, whether by retiring obsolete or redundant software, improving existing software, or by acquiring new software.

It is unlikely that stakeholders from a utility's Information Technology (IT) organization and from its Operational Technology (OT) business units share a common view of the key characteristics and value provided by any particular application. This can result in a perception of bias or arbitrariness in the development of the future plans for an application. In such situations, a transparent, objective system for characterizing and assessing each application may play a crucial role in avoiding conflict and driving to a consensus regarding the appropriate disposition for an application. The shared engagement of IT and OT in a methodical, holistic APM process that accounts for critical system interdependencies is critical to both optimizing the return on a utility's application portfolio investment, and to advancing the level of understanding and trust between the IT and OT functions.

Keywords
IT/OT convergence
Enterprise architecture
Application portfolio management
Business efficiency
Organization change management

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AN INTRODUCTION TO APPLICATION PORTFOLIO MANAGEMENT

A utility's collection of software applications represents both a significant investment and an ongoing expense. As with any such collection of IT assets, it falls to the Enterprise Architecture function to maximize the value the utility realizes from these expenses. This is done through a discipline often referred to as Application Portfolio Management (APM). A formal definition[1] of APM might be "the ongoing management process of categorization, assessment, and rationalization of the application portfolio." Done well, this process contributes to an organizations ability to execute. Done poorly, and it creates a drag on performance [7].

The term "Application Portfolio Management" contains within it some of the key elements required for success. First, it deals with applications – software items that directly support the business functions of the utility – and does not include those software elements that make up the IT infrastructure (operating systems, database systems, middleware, etc.). Second, it treats the applications as a portfolio – a group of assets that is managed not as random, independent pieces, but as an interconnected and synergistic assemblage of parts that together empower the utility's business processes. Last is the concept of management – taking actions that modify the contents of the portfolio, whether by retiring obsolete or redundant software, improving existing software, or by acquiring new software.

The Need for APM

According to Serena Software:[2]

> [a] typical IT organization expends as much as 80% of its human and capital resources maintaining an ever growing inventory of applications and supporting infrastructure. Born of autonomous business-unit-level decision making and mergers and acquisitions, many…organizations manage multiple…applications…and reporting tools. All are maintained and periodically upgraded, leading to costly duplication and unnecessary complexity in…operations. Left unchecked, the demands on the…organization to simply maintain its existing inventory of applications threatens to consume the capacity to deliver new projects.

Some of the reasons for this growing inventory of applications are identified above: business-unit-level decision-making and M&A (mergers and acquisitions) activity. Other significant business changes that can affect utilities in this way include regulatory mandates such as the requirements of the Sarbanes-Oxley Act and industry restructuring (for example, a requirement to divest a portion of the vertically integrated utility). Another obvious driver of application proliferation is advances in technology: new and improved applications are a continual attraction and are often acquired based solely on an analysis of their own merits (rather than taking a

[1] Adapted from Reference 1 (see References section)

[2] Quoted in Reference 1.

broader view across the enterprise), while the older legacy systems are retained due to user aversion to change (or simple neglect).

Finally, there are executive decisions and enthusiasms. Whether these spring from information gathered at conferences, from peers, or are the result of "airline magazine syndrome," individual corporate managers can motivate and direct specific application acquisitions.

Significantly increased costs can result of this unplanned and uncoordinated "piling on" of applications. It has been observed [2] that:

> After years of acquiring software systems and not getting rid of anything, companies have severe application clutter. As a result, given their limited financial resources, they can't meet the current demand for IT unless they "turn off" some applications….The practice of continually adding to the IT burden while holding IT budgets and head counts relatively flat is obviously problematic….And this practice is one of the reasons why many CIOs feel that they simply don't have enough resources to meet internal demand for IT.

This situation can in turn, contribute to IT stakeholders' frustration and feelings that IT is slow to respond, which, left unchecked, may contribute to the downward spiral of IT performance and may lead to calls for IT to be outsourced.

What Can Be Done

APM may be thought of as a form of hygiene, ensuring the health of the application portfolio. In brief, APM can be described as the process of "evaluating new and existing applications collectively on an ongoing basis to determine which applications provide value to the business in order to support decisions to replace, retire, or further invest in applications across the enterprise."[3] This statement contains three important characteristics of APM:

- Its scope includes both *new* and *existing* applications. It is not concerned with other portfolios of interest to the enterprise, such as infrastructure technologies or project portfolios. Furthermore, *all* applications are in scope, both *new* ones being introduced to the enterprise as well as *existing* (legacy) applications
- The process considers the portfolio from an enterprise-wide, *collective* perspective, looking at the portfolio as a package, rather than evaluating individual applications in isolation from each another. Therefore, the APM process must encompass both those applications managed by IT *and* those managed by the business units as operational technology (OT).
- It is an ongoing process. Even if the current portfolio provides satisfactory value at reasonable cost or risk, it cannot remain static in light of new technologies, software market dynamics, and external forces. Application technologies become obsolete over time, vendors come and go (or merge), and business conditions change. As a consequence, the APM process must be repeated regularly to ensure that the application portfolio is providing value commensurate with its cost.

[3] From Reference 1; emphasis added.

At a high level, the steps of the APM process are straightforward:

1. make an inventory of the current portfolio elements
2. assess the condition and value of each of the existing elements
3. determine future plans for each of the portfolio elements
4. create and execute projects based on those plans.

As simple as this might appear, there are several pitfalls and complications that may arise when dealing with application portfolios in utilities.

APM in Context

As shown in Figure 1-1, APM exists in the context of other enterprise-level activities, particularly those associated with enterprise information technology[4] governance. Formalized APM processes are almost universally encountered only in enterprise architecture (EA) or IT groups, which makes it simpler to connect APM to other EA and strategic planning activities. A challenge can be when the EA team only manages the IT portfolio and does not include OT within its purview: in essence the "enterprise" architects are then IT architects only.

All enterprise activities exist to support the organization's *Business Objectives*. Analysis of the Critical Success Factors associated with these objectives drives the development of the enterprise's overall *Strategy,* which may be tracked via Key Performance Indicators or a Balanced Scorecard. Advancing the strategy will be done via an *IT Plan,* which usually contains of Policies, Principles, and Road Maps.

While these sorts of activates and artifacts provide the context for APM, it is really the projects that that implement the IT Plan that are the immediate triggers of APM. The IT Plan will include both *Mandatory* projects and *Discretionary* projects

[4] To avoid confusion, the abbreviation "IT" will be used when referring specifically to the organizational entity responsible for the enterprise information technology function. Information technologies in general, which these days can be found in almost all parts of an organization (including in operational business units) will not be so abbreviated. Later we will use the abbreviation "OT" (for "operational technology") to refer specifically to information technology that is owned and managed by organizational units other than IT.

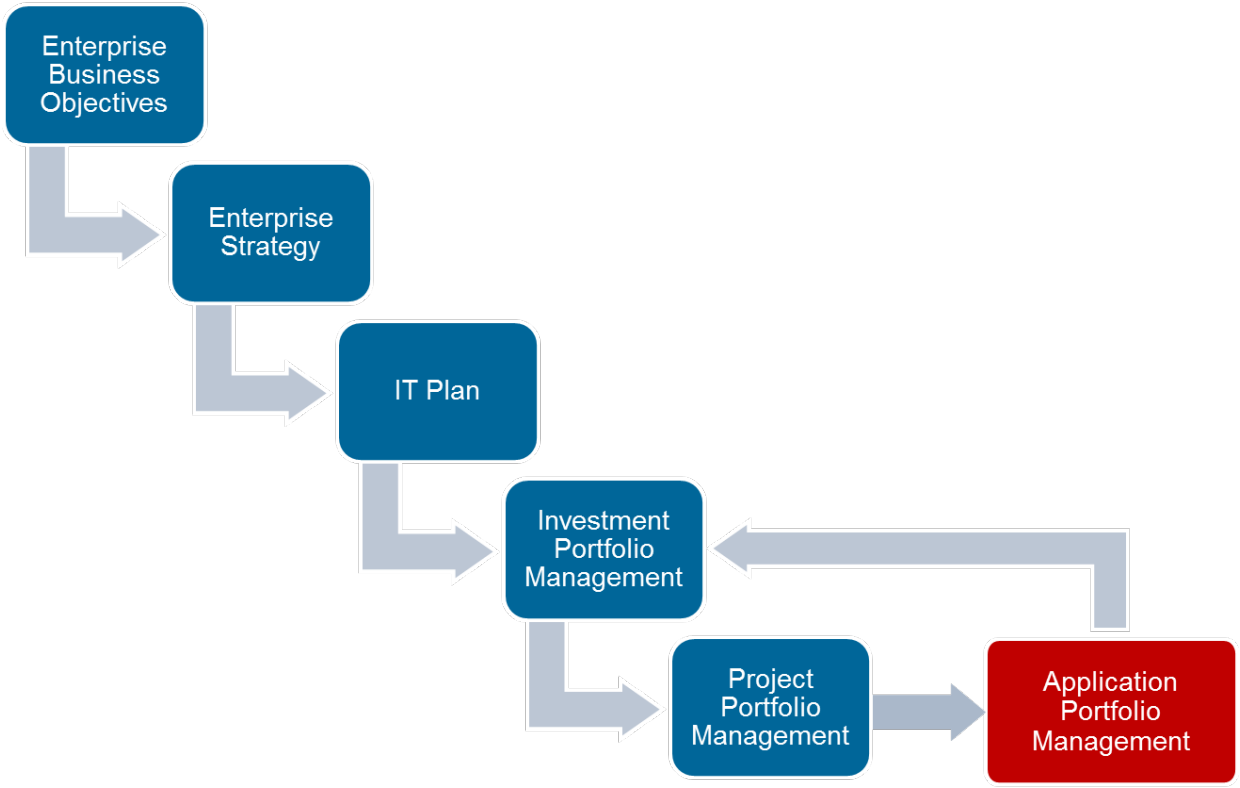

Figure 1-1
Application Portfolio Management as Part of Enterprise IT Governance

Mandatory and Discretionary Projects

Some projects must be done to meet regulatory or other legal obligations. These could include acquisition of information technology (applications and/or infrastructure) to support new business functions or requirements. Other mandatory projects may be necessitated by the desire to keep applications current in order to continue to receive technical support from a vendor.

Discretionary projects, on the other hand, represent opportunities, not unlike the investment opportunities available to a stock or bond trader. These projects will usually be subject to the more cost-benefit scrutiny (for example) than will mandatory projects.

All of the proposed projects will draw from a limited set of resources and should be evaluated with respect both to the value or desirability of the project on its own terms, as well as consider a broader "portfolio" view. This view considers how the proposed project will affect the overall value of all of the applications, taken as a whole. For example, if a proposed application will render obsolete an application already in the portfolio, the project plan should include the cost of removing the older application (perhaps including retraining users, converting databases, retiring unused infrastructure, archiving associated data). If the proposed application will overlap (but not fully replace) an existing solution, careful evaluation should be performed to determine how best to balance the use of the two applications, as well as to carefully assess the dilution of value of both that would occur (perhaps resulting in a decision to invest elsewhere).

Once the projects are approved, execution of the projects will result in the delivery of new or modified applications to be added to the application portfolio. Analyses such as those described above can then be performed to determine if additional projects should be proposed to transform (modify, reposition, or retire) the other members of the portfolio. APM is thus an essential component of this cycle of refinement, that considers the impact of new or modified applications on the existing portfolio and generates new project proposals to maintain it in good condition.

The Benefits of APM

APM has the potential to yield many benefits[5] to the organization, including:

- Greater visibility of where money is being spent (which ultimately provides the baseline for measuring value creation)
  - Easier determination of which legacy applications should to be retired
  - Simpler technical environment and lower operating costs
  - Fewer applications and optimized spending on application maintenance
  - More predictable measurement of service delivery (for project selection)
  - An enterprise view of all applications, allowing easier reporting (e.g., how many applications use Oracle? How many systems support customer relationship management?)
  - A common view of enterprise technology assets (improving reuse and sharing across the enterprise)
  - Clarity on maintenance and support spending
  - Management and tracking of business controls and regulatory compliance for all applications
- Prioritization of applications across multiple dimensions (including value to the business, urgency, and financial return
  - Funding the right application effort (by providing quick access to validated information in support of business cases for investment)
  - Better project solutions (by identifying available capabilities for reuse)
  - Criteria for driving application rationalization and for monitoring impacts
  - An "end state" view for all applications (which helps direct roadmaps and enables progress reporting)
  - Expedited prioritization discussions and executive decision-making
  - Focused IT refurbishment initiatives
- Mechanism to ensure that applications map directly to business objectives
  - Business and IT efforts aligned with business processes by providing:
    - Clarity of the application landscape (leading to synergies across different business units and the pursuit of a global systems architecture)

[5] Modified from Reference 1.

    - Insight into gaps or redundancies in the current portfolio (enhancing the ability to manage risk effectively and efficiently)
- Productive discussions with senior management regarding IT's contribution to business value
- Identification of the strategic and high business-value applications (allowing the redirection of some of the funding previously used for nonstrategic applications)
- Easy and effective analysis of applications impacts of changing business conditions
- Improved focus and direction of investments
- A vehicle to drive the technical portfolio to the "right" mix (based on strategy, architecture, total cost of ownership [TCO], and internal skill sets)
- Prioritized efforts and focus for IT delivery (ensuring the right skills are in place to support business requirements)

An analogy [3] to an investment portfolio may be helpful here:

> Just imagine you bought stock a decade ago for a lot of money, a good investment at the time, but then you did not review its value over the intervening years. Merely sitting on the stock may have been the right thing to do. Then again, you may have missed opportunities to invest more profitably elsewhere if the company was not doing well, or to invest more in the stock if it was profitable. Obviously this is not a wise way to handle your investment, but it's exactly what many companies are doing when it comes to investments in their IT applications!

2
THE APM PROCESS

The actual steps used in performing the processes used to implement APM are straightforward. As shown in Figure 2-1, they consist of the following:

1. *Data Collection* – This step creates the initial inventory of applications that make up the portfolio.
2. *Analysis* – This step develops the insights needed to inform the subsequent decisions regarding possible changes in the application inventory.
3. *Decision-making* – Based on the analysis from step 2, this step creates an action plan for the portfolio members: buy, hold, or dispose/replace.
4. *Optimization* – The final step is to create and execute projects to implement the action plan.

In order to keep the APM results current, the process will need to be repeated at intervals. Hence the illustration shows the APM steps as a recurring cycle.

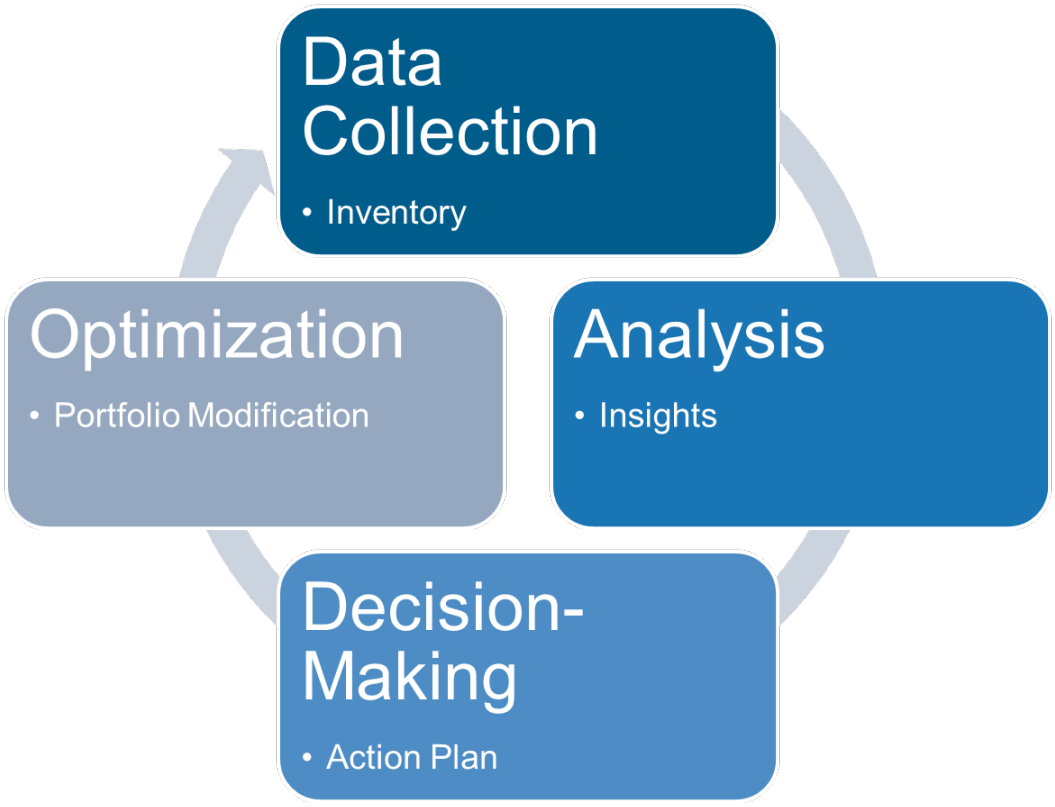

Figure 2-1
Steps in the Application Portfolio Management Process

While there are no particular mysteries associated with these steps, there are many aspects of the details that present both challenges and opportunities, particularly since the majority of utilities are structured with distinct IT and OT organizations. The application portfolio is an enterprise asset, and the opportunity to apply common processes and criteria to its management represents a

path forward for utilities that are working on IT/OT convergence [4]. More analysis of this opportunity will be found in Chapter 3.

Step 1 – Data Collection

Data collection begins with simply gathering information about the applications that the enterprise uses. This may be easier said than done, particularly of there is a significant amount of "shadow" or "satellite" information technology in use that is not visible to the group that is performing the data collection task. In addition to the readily visible OT used by operations groups, one might also need to seek out technologies that finance, legal, or HR groups have acquired to meet their specialized needs. These days much of this technology may be housed externally, in various cloud computing environments. Nevertheless, to the extent that these systems are significant for performing enterprise functions (and consume enterprise resources), or are integrated with other applications in the portfolio, they should be included in the inventory.

As the inventory progresses, increasingly detailed information should be collected (see Figure 2-2) to get a better picture of the applications and their characteristics. When performing the subsequent analysis step, the characteristics and attributes of the applications, including both functional and nonfunctional aspects, should be understood. For example, it will be important to identify applications that rely on obsolescent computing environments (hardware or operating systems) or that don't adhere to strong cybersecurity practices and principles.

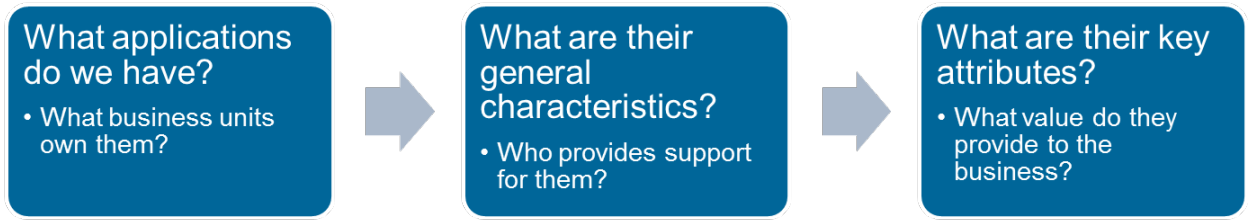

Figure 2-2
Drilling Down into the Application Portfolio

Since the Enterprise Architecture group is usually charged with performing APM, they will normally have the task of gathering information about the applications for the inventory. Some of this information (such as maintenance and support contracts or depreciation of capitalized licenses) will probably be available from corporate accounting. However, if the OT is managed by other business units, then at least some of the information required will have to be collected directly from the business units. Often this includes "softer" information, such as the suitability of the application for meeting current business needs, the training or data conversion costs that might be incurred were the application to be replaced.

The EA group is often not in possession of such information, so gathering it will necessitate a certain amount of outreach to the business units and the achievement of a certain level of trust. This presents a challenge (if the trust relationship is not strong), and also presents an opportunity for development of collaboration between EA's IT specialists and the OT specialists from the business unit.

Step 2 – Analysis

Depending on the state of IT/OT relations, gathering the necessary application information described above might prove tricky. However, a potentially much greater collaboration challenge lies in the analysis step, when the information gathered is interpreted to produce insights into the states of the individual applications.

Continuing the analogy to managing a financial portfolio, the APM evaluation process rests on balancing the strategic value of an application (analogous to the return on investment [ROI] of a financial instrument) and some metric (usually cost or risk) associated with using the application (retaining the financial instrument om the portfolio). While the strategic value is of an application is usually relatively stable (barring rare events such as market restructuring or mergers/acquisitions), the cost or risk metric can easily change over time. For example, the application supplier might (or might not) maintain the application appropriately, keeping up to date with infrastructure updates (such as the operating system or database versions that the application relies on). Also, external technical changes, such as the release of alternative applications that could provide more value than the incumbent application, might occur. This crux of the APM analysis is the proper tracking and evaluation of such changes in light of the enterprise's cost or risk tolerance, as well as the opportunity costs of with forgoing or delaying application replacement. This is analogous to managing a financial portfolio in which returns are relatively steady and predictable, but the costs of alternative investments and potential missed opportunities are dynamic and may be significant.

Although the analysis step begins with the consideration of the strategic value of the application to the enterprise, oftentimes, EA is poorly placed to make such a judgement on its own and must therefore rely on the OT business unit to provide this critical information. Sometimes the cost or risk metric is just the budgeted costs associated with maintaining the application (including acquisition cost depreciation, support contract, the depreciation and maintenance costs of the infrastructure required to host the application, etc.). Standardized definitions and a cost "chart of accounts" can be used to gather this information in a fairly rigorous way.[6]

Alternatives to the Cost Metric

Cost is not the only possible basis for determining whether an application should remain in a portfolio. The most common alternative to pure costs is a metric based on the risks associated with retaining the application in the portfolio. In this approach, in addition to the financial risk of retaining an underperforming application, other less easily quantifiable risks can also be included. For example, the risk of the application supplier going out of business or dropping support for an application (due to a merger or acquisition, for example) can be included. Another might be the risk of declining availability of skilled support staff for an application that is struggling to retain market share.

Another alternative metric is "architectural debt." A modification of the idea of "technical debt" that was originally introduced some twenty-five years ago[7], the basic idea is that small, suboptimal or exceptional technical changes ("debts") that may be justifiable under the

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[6] This method is often used to perform cross-organization benchmarking of IT groups.

[7] By programmer Ward Cunningham, in the course of developing some financial software.

conditions of the moment will gradually accumulate over time, burdening the system with a backlog of corrections or even wholesale changes that would be necessary to return it to a "debt-free" state. This is somewhat analogous to the problem of deferred maintenance on infrastructure: short-term fixes (patches, reinforcements, workarounds, etc.) gradually accumulate until either the infrastructure collapses or becomes unmaintainable and must be replaced at great expense, perhaps under time pressure that might have been avoided if the debt had been repaid sooner.

Utility enterprise architects have extended "technical debt" into "architectural debt" and applied the concept to infrastructure portfolios [5]: its use with application portfolios is also worth exploring. The basic idea is that repeatedly allowing architectural exceptions and deferring remediation of legacy architectural issues will have the combined effect of encumbering the technology with a form of "debt" that will ultimately have to be paid back. For example, allowing an application of high strategic value to be acquired despite its reliance on nonstandard infrastructure technology will burden the enterprise with an infrastructure investment that cannot be repurposed should the application eventually be retired or replaced. Furthermore, continued enhancement of the application (such as installation of "specials" for an energy management system [EMS]) will increase the dependence of the enterprise on the application, making it more difficult to replace it with a more-compliant alternative in the future. These sorts of "lock-ins" represent the "architectural debt" that will eventually have to be repaid.

IT/OT Agreement on the Analysis Process

It is important that the EA team that usually leads the APM process (which often represents IT) achieve maximum cooperation and buy-in from the business unit(s) that are responsible for OT. Since the enterprise portfolio includes both IT and OT applications, it must be analyzed as a single portfolio in order to provide a complete context to properly assess each application. For example, an enterprise can only tolerate a certain level of total risk and if the risk represented by the applications in the portfolio is not considered as a whole, appropriate trade-off cannot be made to balance risk vs. value.

Similarly, the development of the value metric or the cost/risk metric will require agreement from all parties (IT and OT). There must be confidence in the data gathered (such as costs or value ratings) and there must be transparency (and concurrence) with respect to the calculation of the costs, risk, debt, or whatever metric is to be used.

The Portfolio Analysis Chart

Once agreement has been reached on the metrics to be used and on the information and calculations on which the applications will be scored, the APM portfolio analysis chart (Figure 2-3) can be produced. While the details of the chart (such as the specific numeric values) are not important, subsequent analysis will be aided by using a scatterplot on a graph with the value and cost/risk/debt axes orthogonal to one another.

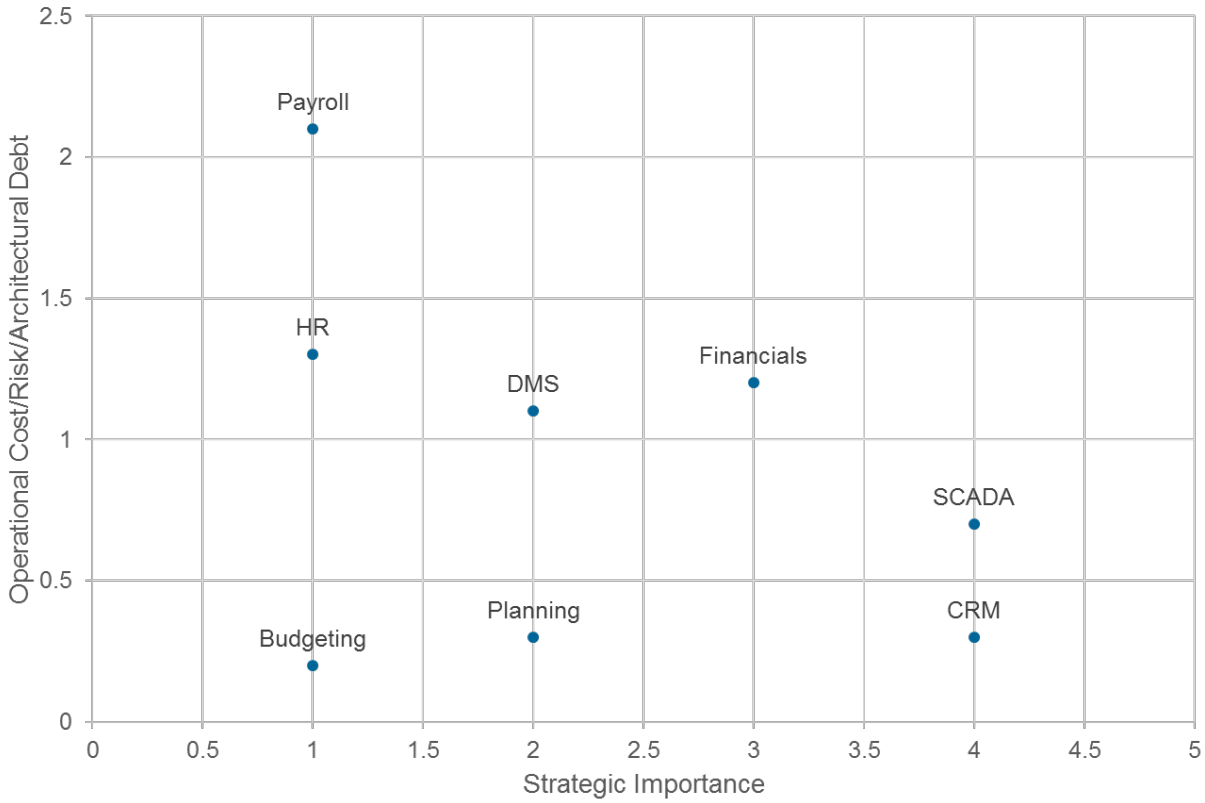

Figure 2-3
An Example of a Portfolio Analysis Chart

Step 3 – Decision-Making

To begin the decision-making step, the applications should be clustered into four groups. Although analytic distance metrics could be used for this process, a basic division of the data area into quadrants is easier and may be clearer to present. Nevertheless, such a quartering of the chart does not have to be done evenly (at the midpoints of the axes): depending on the enterprise's willingness to accept higher or lower values or costs, the subdivisions may be shifted along each access as desired. When complete, however, each application on the chart should be associated with one of four groups (see Figure 2-4)

1. **High-Value, Low-Cost/Risk/Debt –** Applications in this group are providing good value at an acceptable cost or risk. They should be retained and/or renewed as necessary in the future.
2. **High-Value, High-Cost/Risk/Debt –** Applications in this group are providing good value but at an unacceptable cost or risk. Alternative solutions should be sought to replace thee applications with ones that provide similar value but at a more acceptable cost/risk.
3. **Low-Value, High-Cost/Risk/Debt –** Applications in this group are providing low value and doing so at an unacceptable cost or risk. If the business functions they support are not required, these applications should be retired. If that is not possible (if the business functions are necessary but not strategic) alternative means of supporting these functions (such as outsourcing) should be considered.

4. **Low-Value, Low-Cost/Risk/Debt –** Applications in this group are providing low value but are not operating at an unacceptable cost or risk. If the business functions they support are not required, these applications might be retired. If that is not possible (if the business functions are necessary – but not strategic) these applications would also be potential candidates for outsourcing.

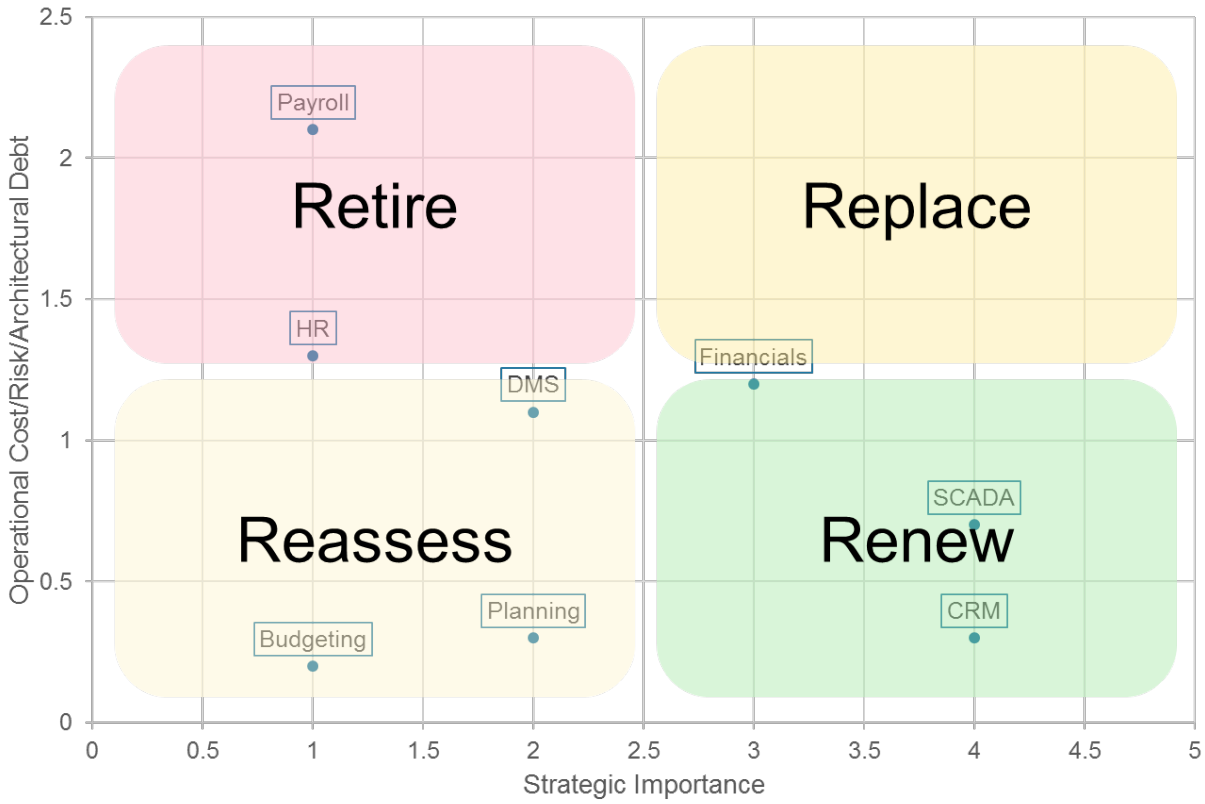

Figure 2-4
Possible Investment Actions Suggested by the Portfolio Analysis Chart

The Action Plan

The outcome from this step is an action plan for modifying the portfolio. While some strategic suggestions are shown in Figure 2-4, they are not specific enough to form the basis for defining projects to optimize the portfolio: application-specific roadmaps are required.

Outsourcing of applications is one way to avoid some costs, to reduce some risks, and to avoid some architectural debt. Applications in the high-value/low-cost/risk/debt group provide efficient support of strategic business functions and would probably not be candidates for outsourcing. On the other hand, applications in the low-value/high-cost/risk/debt group are probably obvious candidates for outsourcing.

Applications that are assessed as providing low value (but that cannot be eliminated altogether) or that are high-value but also high-cost/risk/debt may be good candidates for some mixture of outsourcing and retention. Applications that implement relatively low-value services may be available off the shelf (in effect outsourcing their design and construction) but might be easy to deploy and operate on in-house infrastructure. On the other hand, high-value applications that are

also high in cost, risk, or debt could be designed and built in-house (to capture maximum strategic value by tailoring them to the enterprise's needs) and then the operation of the application could be outsourced. The deployment of the application (including integration and configuration) may be done either as SaaS (Software as a Service, with the deployment done by the service provider) or as PaaS (Platform as a Service, with the enterprise performing the deployment). See Figure 2-5.

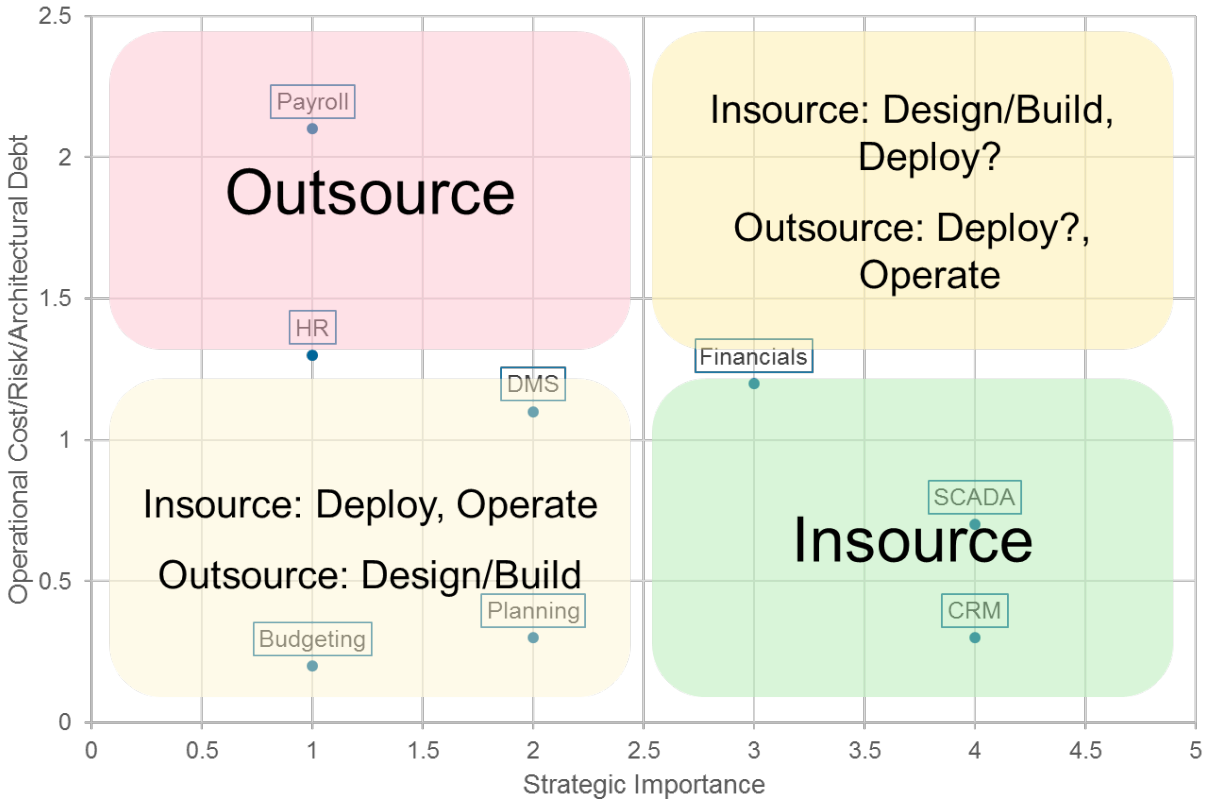

Figure 2-5
Possible Lifecycle Sourcing Actions Suggested by the Portfolio Analysis Chart

Note that a number of the applications in the chart all on or very near the borders between the different quadrants. This is meant to suggest that the analysis and decision-making may be unclear or ambiguous. As such, all interested parties (IT, OT, EA, and the affected business units) should work together to achieve agreement on the action plan.

Step 4 – Optimization

The last step in the APM process is to optimize the portfolio. In this step, the action plans from the previous step are considered as a whole and the overall impacts on the portfolio considered. For a variety of reasons, not all sources of high cost, risk, or debt can be removed from a portfolio in one giant step. All enterprises have a certain non-zero risk tolerance, for example, so elimination all sources of risk from the application portfolio is not necessary. It might not even be a good idea, since a certain amount of risk may be a necessary part of achieving business success. Project plans should be developed and prioritized in a way that reflects this holistic view of the modified portfolio.

It is important to realize that the outcome of this step is portfolio *modification*. That is, the final result is neither action plans nor roadmaps, nor even the project portfolio, but the actual modified portfolio itself. That means that the APM process doesn't end until the projects have been executed and modified portfolio is in place. Of course once that occurs, it's time to being the APM process all over again.

3
ALIGNING IT AND OT

The rise of the smart grid has placed utility IT and OT on converging paths. Currently, many utilities still treat the IT and OT domains separately. A recent study [4] found that while precise definitions for "IT" and "OT" can be elusive, the distinction remains are real for most utilities. Even those that have brought all of their information technologists into a single enterprise organization often distinguish IT from OT according to some criteria. Sometimes the distinction is made based on the business functionality supported: "Informational" vs. "Operational" or OT "keeps the lights on" while IT "runs the business." Another possible distinction is based on the technology lifecycle: "IT designs, builds, and maintains; OT deploys and runs."

Another way to view this is to try to place the members of the application portfolio along the IT/OT spectrum (see Figure 3-1). While it may be easy to label accounting systems as IT and SCADA and EMS as OT, the placement of others, such as GIS or MDMS is more ambiguous.

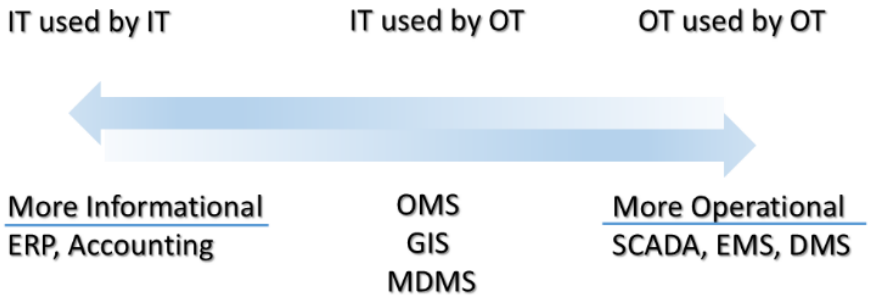

Figure 3-1
Common utility applications mapped to the IT/OT spectrum

In the final analysis, however, all of these applications, whether labeled "IT" or "OT" (or something in between), constitute a single enterprise application portfolio. And they should all be managed by single enterprise APM process with respect to that single portfolio.

Differing Perspectives

Existing application portfolios usually have a complicated history. They are rarely the result of carefully planned, linear evolution. They may have been impacted by mergers, acquisitions, divestitures, deregulation, or other changes in the business environment. Individual operating companies may have their own portfolios. One portfolio is often associated with corporate IT and another associated with a business unit (such as grid operations). Such factors can lead to difficulty in creating the enterprise application inventory, in finding the expertise required to collectively assess the value of the applications, and in achieving agreement regarding the proper roadmap for an application.

These issues arise because APM exists at the nexus of a wide range of enterprise activities (see Figure 3-2). It can make use of the work products from many of these activities. The following disciplines and artifacts may all play a role:

- **IT Strategies –** IT Balanced Scorecards (BSCs) and Strategy Maps; Key Performance Indications (KPIs); Strategy Definitions
- **Business Needs and Applications –** Business Process Modeling (BPM); Organization Charts; Use Cases
- **IT Architecture –** Component Standards; Enterprise Application Integration (EAI) Charts; Unified Modeling Language (UML) Diagrams
- **IT Operations –** Configuration Management Database (CMDB)/Common Information Model (CIM)[8]; Network/Data Center Operation Charts; Service Catalog
- **IT Project Management –** Gantt Charts; Network Plans; Resource Planning Charts
- **IT Investment –** Budget Cycle Planning; Financial Status; Project/Program Portfolios; Project Risk Assessments

The APM process is expected to respond to these inputs (if they exist). Because the application of this information to APM requires some interpretation, agreement among all parties affected by APM is required for a satisfactory (and mutually satisfying) assessment. While most of these are labeled as IT activities, as Figure 3-2 shows they also can exist in "shadow" form in the OT part of the enterprise. If, as is frequently the case, the APM process is run by the EA group, and the EA group typically reports to the IT department, a positive and committed outreach to the OT organizations and stakeholders will be required for a successful outcome.

In many instances the IT organization has mature processes and artifacts in these areas. Nonetheless, the engagement of the business OT organization is always critical to success. In particular, the evaluation of how well the application portfolio meets the needs of business units can never be performed by IT in isolation: it is the domain of the business units. The level of collaboration that is required by an APM process can lead to significant gains in understanding for both IT and OT.

Understanding and Agreement in the IT/OT Trust Relationship

Without appropriate input from the OT business unit, it is unlikely that all stakeholders will possess a clear view of the key characteristics and value provided by any particular application. Proceeding without such input from the business unit can result in a perception of bias or arbitrariness in the development of the future plans for an application. A transparent, objective system for characterizing and assessing each application will be important in avoiding conflict and reaching agreement regarding the appropriate disposition for an application.

The APM process, including the data upon which it is based and the various calculations and decision processes that support it, should be uniform across an enterprise. Application costs should be calculated and categorized similarly for IT and OT applications, and the method for calculating of risk or debt scores should be common across all applications. These metrics can be determined objectively and can form one basis for common understanding and promote a sense of fairness in the process.

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[8] This refers to the Distributed Management Task Force's open standard for IT environments, not the IEC's information standard for electric utilities.

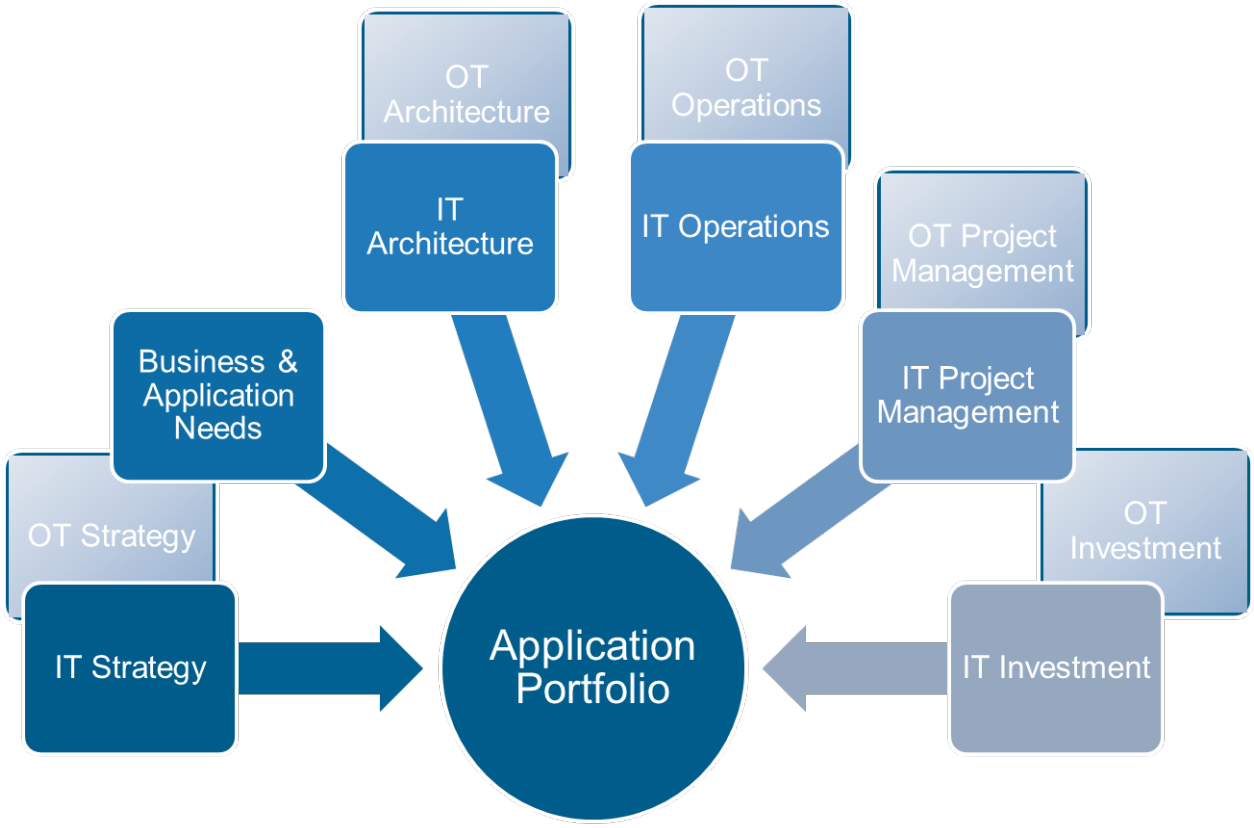

Figure 3-2
Enterprise Activities Related to Application Portfolio Management

While the comparison of the application portfolio to an investment portfolio can be helpful, the metaphor can also be overly simplistic. Replacing underperforming stocks in a portfolio is simple. But applications can (and often do) have connections and overlaps with other applications and have dependencies on infrastructure components that can greatly complicate their roadmap, all the more so if they rely on customized or proprietary interfaces that make integration even more complicated. A methodical, holistic process that accounts for these interdependencies is critical to optimizing the return on a utility's investment in its application portfolio. With clear communication and trust between the IT and OT organizations, the utility can advance its APM maturity as far as it desires (see Figure 3-3).

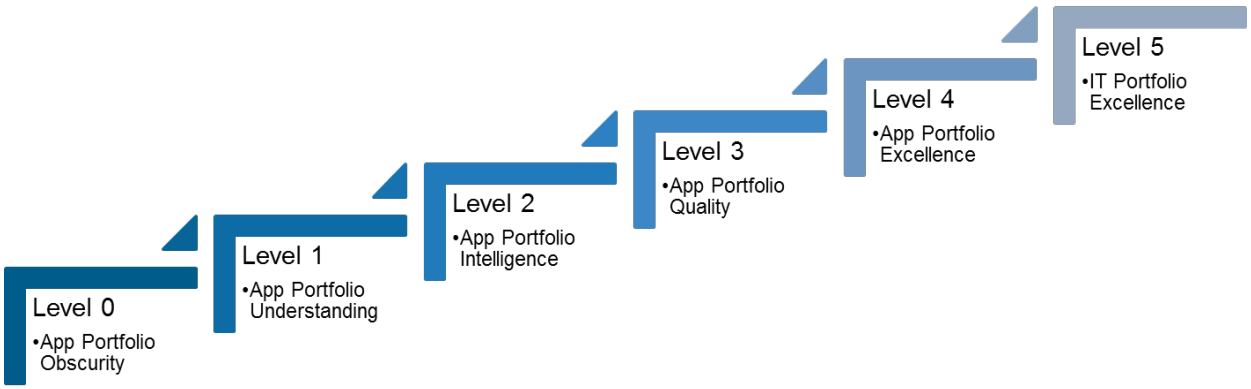

Figure 3-3
An Application Portfolio Management Maturity Model[9]

Previous EPRI research [4] has identified the critical role that trust plays in IT/OT collaboration. One technique for enhancing trust is to "Make sure that there are shared objectives … solve problems together." APM potentially provides both a challenge for utilities as well as an opportunity. For enterprises with little experience in cooperation, new paths must be opened between IT and OT and information and perspectives must be shared and respected. Thus the optimized utility application portfolio can be the shared objective and the APM process embody the problems to be shared together that will advance IT/OT trust and help smooth the path to a converged future.

[9] Adapted from Reference 6.

4
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