

Application Portfolio Management: An Approach to Overcome IT Management Challenges

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Abstract— Organizations are looking for innovative means to stay ahead of the competition even while having to practice austerity in economically stressed environment. Technology, being the business enabler, is constantly called upon to deliver solutions that business can adopt to improve its prospects. IT leaders are expected to create applications that can balance cost with complexity while delivering desired value to business. There is increased focus on developing more agile applications and technologies to support the business without compromising the performance of existing systems.

The process of application portfolio management plays a big role in helping the organizations acquire a competitive edge while keeping the operational costs under control. It is a concept quite similar to financial portfolio and deals with inventory analysis of a company's software applications for optimizing business benefits of each application. Research suggests that resolving application portfolio issues goes a long way in improving business-IT alignment.

This paper introduces the concept and discusses the practices and benefits of application portfolio management. It looks at various approaches recommended by the consulting community and academicians to deal with management challenges brought about by the complexities of IT applications accumulated over a period in the organizations.

Keywords— *Business Enabler, Performance, Competitive Edge, Operational Costs, Business-IT Alignment, Management Challenges*

I. INTRODUCTION

Businesses of today are hard pressed to minimize costs and improve efficiencies to overcome economic challenges of the modern times. Globalization, coupled with changing business demands, is posing constant demands on technology leaders to innovate and adapt quickly. They are under the pressure of market forces to deliver more agile applications and technologies to support the business without compromising the performance of existing systems. It's a real tight rope walk for them to balance cost with complexity while delivering value to business. Application Portfolio Management (APM) is a concept which can help an organization have a competitive edge while containing operational costs. This terminology has been borrowed from the financial sector. The term 'Portfolio Management' traditionally signifies management of financial investments thereby enabling decision makers to choose among an increasing number of complex options in an ever-changing environment [1]. An application portfolio has similar utility as a financial portfolio. Just as a financial portfolio groups together similar investments along with their associated values, an application portfolio provides a group wise consolidated view of all the applications along with their functional and financial attributes. Both enable the portfolio owner to arrive at an informed decision based on the collated data.

Applications in this context are the software programs

designed to perform a specific function directly for the user or, in some cases, for another application program. Swanson & Dans [2] defined application as pieces of software that logically can be seen as a system, with input, processing and output of data. Some of the examples would be, email, presentations, word processing, CRM, ERP etc. The idea here is that applications must be managed like a financial portfolio by balancing risks and budgets in order to meet management objectives [3]. Ward & Peppard [4] termed APM as a means of evaluating how existing, planned and potential applications contribute to achieving business goals.

Application portfolio management first came to the fore in the 90s and by the turn of the century it started being recognized as a key concept to optimize IT landscapes. It can be safely assumed that APM is now at the top of every progressive organization's to-do list. To quote Techtargit [5], "Application portfolio management (APM) is a framework for managing enterprise IT software applications and software-based services. APM provides managers with an inventory of the company's software applications and metrics to illustrate the business benefits of each application". APM provides a series of repeatable processes through which it is possible to assess if an application needs to be replaced, upgraded or eliminated so that money being spent on non-performing or underperforming applications could be put to better use in the improved and better performing applications.

In their Application Landscape Report (2011), a leading IT consulting firm, Capgemini [7] observed that most companies carry more applications than their business require and they are forced to spend valuable IT resources on supporting these obsolete systems instead of deploying their assets on future growth. Olavsrud [8] noted that even though there are a large number of applications deployed in the organizations, only a handful are actively used. This phenomenon must be a cause of concern to these organizations because they end up wasting large sums of money on maintaining even unused applications.

With the help of an effective APM system a CIO can get an aggregate view of the number of applications, their values and associated risks. APM also provides the ability to analyse the applications through a detailed view. Hence, an APM system enables an organization to effectively align its IT budget priorities with business strategies.

II. WHY APPLICATIONS ACCUMULATE

Most of the organizations, especially the ones in existence for long, have to deal with a proliferation of applications across departments. IT consulting major, Capgemini [7] surveyed over 100 CIOs globally with 85 percent of them suggesting that their application portfolio needed to be rationalized. A good 60 percent felt they were having to support far more applications than they needed.

Applications tend to get piled up for a variety of reasons. Sometimes the users are hesitant to adopt a newer version, preferring to continue with the older one because of the developed comfort. Applications are also inherited in

merger and acquisition scenarios which often adds to the already bulging applications landscape in the organization. Out of this, many applications may not be used at all. At times applications are under-used because their functionalities do not fulfil user requirements. A tacit rejection from the users can't be ruled out in such cases. This can happen when there is a disconnect between IT developers and the business users at the design stage. However, it's not that all applications would become redundant over time. Many of them, that are deployed after a thorough requirement analysis, stay on and even get enhanced or modified. Then there are many applications that organizations get custom-developed as per specific user needs.

Significant cost is incurred on assigning resources for these applications not only to run them but also in maintaining them as well as managing their licensing and compliance obligations etc. Therefore, organizations must proactively consider arresting this trend of reckless application accumulation and keep their portfolio lean and effective. To overcome this challenge, one must have complete awareness of application landscape in terms of the usage and resource consumption. This is where APM comes to the rescue of IT leaders.

III. IMPORTANCE OF APM

One of the primary objectives of application portfolio management is to align IT with evolving business initiatives. Apart from business-IT alignment, there are many reasons that APM has come to be regarded as critical practice for modern organizations. It is not just the cost reduction that present day businesses are concerned about. They have to deal with many other challenges in keeping the organization competitive in the market place. Managing the IT resources in perfect health and harmony is a major issue for the companies.

With every passing year as several IT applications get accumulated, especially in merger and acquisition scenarios, managing and maintaining them presents a massive challenge both in terms of efforts and high maintenance cost. Research has revealed that a major chunk of organization's IT budget is spent on maintaining legacy applications, which could be as high as 80%. As a result, CIOs are left with a very little amount of funds to utilize in executing new initiatives. Actually, dispensing with these legacy applications may not be practical as other evolving ones may need them for integration. Therefore, it is important to maintain a comprehensive and up-to-date knowledge base of the existing IT applications. With disparate applications built on different technologies and deployed across multiple locations it is even more challenging to collate their characteristics into a database.

Maintaining control over such complex technology environments is very critical for IT management executives. Application portfolio management as a discipline offers that control by managing this critical piece of information on IT applications in a composite repository. It enables the IT operations to be rationalized and optimized, thereby providing greater control over their deployments and offering better business value.

APM brings in a process of comprehensive evaluation which facilitates transformation. This helps to reduce cost and optimize value, align business and IT strategies, and standardize business practices etc.

IV. APM APPROACHES

APM is primarily a practice of grouping together applications with similar functions, assessing their financial

value, and cataloguing them in a way that allows for analysis at multiple levels. Resolving the portfolio issues goes a long way in improving business-IT alignment. With ever increasing focus on corporate globalization IT leaders are facing even bigger and complex challenges to rationalize their application portfolios. Various methods have been proposed by researchers and consulting community to analyse and restructure applications in an organization.

Management of IT portfolio is the process of rationalizing and organizing IT applications in the organization to meet specific business needs. This particular approach to optimize IT landscapes is known as application portfolio rationalization (APR). Rao [9] described APR as a process wherein applications in an organization are analysed to identify overlapping functionalities, unused, redundant, underused and high-maintenance applications, and bottlenecks in systems with an aim to achieve cost reduction, efficiency improvement and optimum business-IT alignment. APR can't be looked at as a mere cost cutting exercise as it has greater value to offer. It is an initiative wherein an organization can transform its application portfolio from moderately effective into an agile one which is more efficient and aligns well with the business needs. If approached in a strategic manner using sound project management practices, APR can help the organizations improve bottom-lines while enabling them to strive for better top-line growth.

An APR initiative can have a desired impact only when implemented as a continuous process. To derive maximum value for the organization, the involvement of all stakeholders including those in-charge of the applications is imperative.

At a macro level the APR is a three-step process as under [10];

1. Form a team to compile an inventory of all the IT assets in the organization into an application portfolio.
2. Conduct assessment of the application portfolio using various methodologies.
3. Make decisions about the fate of the assessed applications by analysing possible transformation scenarios

Applications cannot be assessed only based on their cost but even the value they bring to business has to be measured. Besides this, another important consideration during this process is the infrastructure components which must tie with the application. It shouldn't happen that the infrastructure piece is treated in isolation and gets removed in the process, making the application running on it disappear along with it! Therefore, it is important that the data gathering process is carefully organized in an integrated fashion to include all assets of organizations' IT landscape viz. applications, technologies, infrastructure etc.

Having listed all IT assets, the collected information is analysed on the basis of different perspectives evolved from a company's business strategies. The outcomes of this exercise is identification of possible transformation scenarios. These scenarios can be further analysed to arrive at the best fit for the organization and plan the transformation roadmap by prioritizing the projects. Managing an enterprise IT transformation program is an important priority of CIOs in today's organizations. Capgemini [7] opined that having a clear picture of present IT landscape is imperative to initiating any transformation project.

Parker [11] discussed following three key areas for rationalizing an application portfolio.

- *Reduce Cost and Remove Complexity:* This involves consolidating redundant applications, eliminating unused applications, replacing high maintenance applications, alternative for less used applications etc.
- *Deliver More Business Value:* This means looking at areas such as elimination of workarounds in the applications, assessment of business value of the applications, identifying functionality gaps, optimally utilizing existing functionality, using more of commercial applications.
- *Reduce Maintenance and Support Risks:* This deals with evaluating unsupported applications, assessing skill availability, assessing application complexity and documentation.

Oracle Corporation whitepaper [12] also described application rationalization as a three-step process in the following figure which elucidates this approach in a fairly crisp manner.

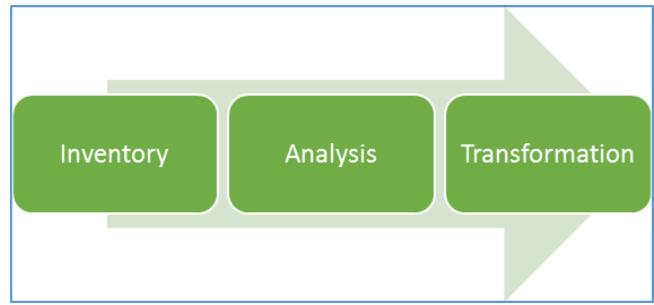


Figure 2: Application Rationalization Process

At the end of this step, emerges an output of APR in the shape of a transformation roadmap. Following a series of iterations, it is possible to further refine the portfolio to make it well aligned with the organizations’ business objectives.

Compiling inventory of a vast and complex IT landscape is quite an arduous task if carried out using traditional tools like spreadsheets. Maintaining this kind of data calls for recurring updation efforts while ensuring that cross-references are updated properly. Therefore, it’s advisable to use one of the many readymade APM solutions available. They help in maintaining application inventory, its value assessments, costs, and business and technology efficiency parameters. They also must help organize the process of decision about changes to the portfolio. A state-of-the-art APM solution works through a central data repository which makes it possible to cross-reference data and manage changes quite efficiently, thereby addressing the complexities of modern IT resource management.

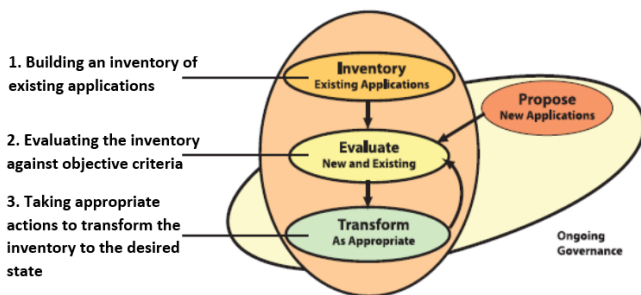


Figure 1: Application Rationalization (Source: Oracle Corp)

- *Inventory:* All the existing applications in the IT landscape of the organization are taken into account.
- *Evaluation:* Allocation inventory is evaluated and gaps identified for either improving the existing applications or making a case for the new ones.
- *Transform:* First a plan is created to modernize the application portfolio based on the outcome of evaluation exercise and then the implementation is carried out to reach the desired state.

Basically, the process to rationalize application portfolio is a three step approach as seen in the diagram below. These generic steps can be briefly described in figure 2 below.

1. **Building application inventory:** In this step, application, its cost, owners, type, user information, technologies used, its design, security aspects etc. are identified and documented.
2. **Analysis of portfolio:** Analysis of the application portfolio is performed along four perspectives, namely, business, technology, operational, and financial. In this, KPIs and metrics are identified so that application ROI can be determined. Interviews with stakeholders, awareness workshops and research activities are important components of this process.
3. **Creation of transformation roadmap:** In this step each application is taken into consideration and the best possible action for managing it is determined such as;
 1. Eliminate application
 2. Update application
 3. Enhance application
 4. Replace application
 5. Retain application (maintain status-quo)

V. CRITICAL SUCCESS FACTORS

APM is a strategic initiative that has organization wide impact since it deals with a general proliferation of applications all around the enterprise. Contending with hundreds or sometimes thousands of applications to create an optimized portfolio demands an organized approach with participation of all key constituents of the organization. To realize the business value from this portfolio rationalization, exercise an NIIT white paper [15] suggested following critical success factors.

- **Top management support:** This is the most important factor. Management buy-in is necessary because of the strategic significance of this enterprise-wide program. An APR exercise might impact organizational structures, job roles, technologies etc. Top management is required to ensure that its vision and strategic objectives are aligned with the rationalization program, while ensuring that all stakeholders are on board.
- **Cross-functional teams:** Solutions, if designed with inputs from both business and technology functions, can be rapidly built and implemented quickly. A cross functional team can lend its expertise to cover all critical functionalities to deliver top quality applications.
- **Stakeholders involvement:** Cross-section of stakeholders like business owners, end users, application and IT managers etc. actively participate in the optimization exercise. They play a major role in planning the scope and priorities and putting an executive approval on the project. Executive stakeholders invoke control mechanism to keep a tab on the costs and performance aspects. This helps in improving governance and business-IT alignment by ensuring that the initiatives are aligned with business strategy, goals, and objectives.

- **Budget and resource availability:** APR programs often don't reach the desired end due to constraints on the budget and resources. Proper assessment and approval of these two aspects before starting the program makes the journey smoother and facilitates achievement of desired objectives.
- **Regular monitoring:** Regular maintenance and assessment of the portfolio by appropriately skilled experts helps in serving company's business objectives.

Author Rao [9] lists following challenges that must be tackled for an APR initiative to succeed.

1. **Management of all the stakeholders:** The stakeholders can be from business as well as technology side. In many cases legacy applications may have multiple owners.
2. **Securing management buy-in:** This being a strategic initiative, management commitment and buy-in serves to keep it under focus all the time.
3. **Using APR framework as a continuous process:** If APR is treated as a one-time effort the results won't be consistent, especially the alignment with business strategy.

VI. BENEFITS OF APM

APM has many benefits to offer in terms of streamlining the application landscape of an organization by instituting an application rationalization process. Perhaps the most significant benefit of rationalization effort is that it provides IT executives a greater understanding of their existing landscapes which acts as a trigger for optimizing their IT environments. Numerous other benefits have been identified by the consulting companies as well, some of which are mentioned below.

- Helps in reduction of IT operations costs while improving service efficiency.
- Duplication of application functionality is eliminated.
- Maintenance costs of software/hardware are optimized.
- Enterprises become lean and efficient while being able to focus on projects with high business value.
- Propagates clarity on service level agreements with the service partners.
- APM enables managers to monitor costs thereby reducing expenses wherever possible.
- It improves communication between various functions of the organization which helps in smoother execution of operations.
- It ensures utilization of resources in optimum manner by being able to detect redundant and repetitive applications.
- Provides an organized approach to assess costs and business values so that informed decisions can be made.

An Oracle Corporation whitepaper [12] also cited several such benefits as mentioned below;

- **Releases money for new initiatives:** At the time of evaluating applications many opportunities to save cost would come up. This money saved can be utilized for applications that carry the best value for business.
- **Optimizes purchases:** One of the functions of APM

is to screen requests for new applications. APM ensures an informed decision about purchases by doing a benefit analysis of deployed and proposed applications. This helps in saving on unnecessary investments in applications that don't drive business.

- **Prevents redundancy:** APM helps in identifying applications that can perform similar functions for different departments, to avoid duplication.
- **Consolidates to adhere to standards:** When applications are consolidated in a portfolio it reduces the cost of maintenance due to limited diversity to deal with.
- **Reduces training and support requirements:** The cost on training and maintaining applications can come down if the number of applications are reduced following rationalization exercise.
- **Prevents recurrence of the "patchwork problem":** The essence of APM is a sound application governance framework. It is a formal mechanism to ensure that application deployments are consistent with existing IT architecture, align with the business goals, and lower operating and support costs. With a continual governance process in place, one doesn't have to deal with sudden surprises and fix issues in an ad hoc manner. A governance framework also helps in overseeing all applications and track portfolio changes through to completion.

Gartner [16], world's leading information technology research and advisory company, considers APM processes paramount for effective IT management. It believes that besides saving substantial cost, a focused rationalization approach also improves support for business. Moreover, it has benefits in terms of simplified infrastructure and availability of resources so that organizations can lend more focus to key functions.

IT Lab [17], a UK based IT support and strategic services firm, believes that APM helps in assessing not only total cost of ownership but the value of an application as well. They cited several benefits of implementing APM for an organization such as;

- Alignment of business strategy with IT
- Transparency to IT resource costs
- Elimination of functional duplication and waste
- Increased speed to deployment
- Reduces costs and optimises value

APM helps an organization in building a roadmap for IT transformation. With a complete application inventory, IT managers can make a well-thought out decisions about future application changes in terms of retiring, modernizing, and consolidation.

CONCLUSION

Application portfolio management is a process that involves rationalizing and organizing IT applications in an organization to meet its strategic business objectives. Organizations across all industry domains possess disparate IT applications and find it challenging to reduce total cost of ownership and complexity while improving operational efficiencies. Many more applications get added through merger and acquisitions and new development requirements, leading to changes in application portfolio landscape, thereby increasing the need for portfolio rationalization so as to keep it aligned with business needs.

APM is quite similar to financial portfolio management as it also involves analysis of risks and rewards. Based on the available budget an IT manager can analyse the technology environment in view of the business needs so as to alter, defer or cancel projects that show low returns on investment in terms of business benefits. Proactive portfolio management helps technology managers understand the needs for specific projects before initiating their implementation.

To prevent deterioration of application portfolio over time, it is important that an organization develops a mechanism to clearly visualize the state of the portfolio and define a strategic IT roadmap to modernize and consolidate legacy applications or move applications to flexible technology platforms.

It must be recognized that APM is not a one-time exercise. It needs to be a part of IT management framework as a continual process consisting of cataloguing, categorisation, assessment, rationalization and disposition of applications so as to achieve better business-IT alignment, enhanced utility and lower costs. In doing so it is crucial to first understand the big picture and then adopt industry best practices in project management and governance to execute a rationalization project. A sound project management plan would go a long way in ensuring success of an APM initiative to overcome IT management challenges in today's enterprises.

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