

12-2013

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Citation

NARASIMHALU, Arcot Desai. Designing Optimal Innovation Portfolio. (2013). *International Society for Professional Innovation Management Innovation Symposium, Melbourne, Australia, 8-11 December 2013*. Research Collection School Of Information Systems.

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Designing Optimal Innovation Portfolio

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Abstract: There have been many approaches towards investing in innovation projects. There has been very little discussion about the need to align such investments with the mission, vision, goals, leadership style, value discipline and risk appetite of an organization. This paper reviews existing approaches to innovation related investments and suggests the setting up of a proper innovation portfolio management process along with three dashboards that will help make innovation related investment decisions in an informed manner. The resulting innovation portfolio will be optimal in its alignment with an organizations mission and vision. We expect this method to be used by all types of organizations whether they are for profit or not for profit.

Keywords: Innovation Portfolio; an example; of the style; for keywords. Please use about 10 keywords and separate them with semi-colons.

1 This is an example of a first level heading

Innovation has become a hot topic in recent years. Some claim that the only sustainable competitive advantage a company can have is its ability to identify, develop and deliver a continuous stream of innovations. Such an advantage can only be achieved if the company is able to manage its innovations related investments in an optimal manner. Many of the approaches to investments in innovations have neglected to consider the need for alignment with the mission and vision of a company. Further, companies' leadership style and value discipline has not been considered in designing Innovation Portfolios. Innovation investments need to be aligned with the leadership styles and value disciplines as well. Lastly, investments into innovation related proposals need to take into account the risk appetite of the company as well.

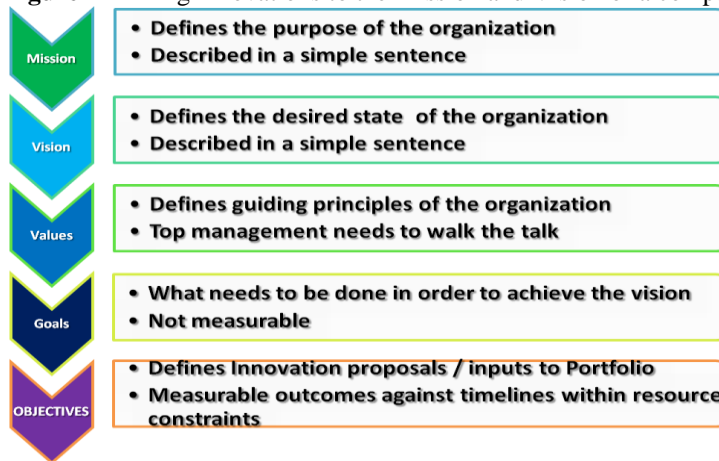
We define innovation portfolio as the collection of innovation projects aligned with the mission, vision and values of the company that a company supports for maintaining or improving its market position. Section 2 of this paper defines the link between a company's mission and vision and innovations. Different leadership styles and the different value disciplines that a company could choose to adopt are discussed in Section 3. It also discussed the implication of selecting different leadership style and value discipline on the organization of innovation portfolio. Section 4 introduces three key dashboards that are essential for effective management of investments into innovations. It also briefly touches upon organizational aspects on innovation portfolio management. Section 5 introduces a method for optimal design on innovation portfolio of a company

that is based on the concepts developed in the earlier sections. The last section summarizes the contents of this paper.

2 Linking innovations with a company’s mission and vision

Figure 1 provides a visual representation of the link between a company’s mission, vision and innovations.

Figure 1 Linking innovations to the Mission and Vision of a company./



Mission statement of a company defines the purpose or reason for existence of a company. Vision statement reflects the aspirations of the company and is often used to motivate its stakeholders towards a future positioning of the company. Goals of a company are the means of achieving its vision. Goals are decomposed into Objectives that have measurable outcomes against well defined time lines and resources. Objectives translate into innovation projects. Each objective can serve one or more goals of the company. Each Objective should have a statement that captures the deliverables, time frame, resources allocated and quality level to be achieved.

Goals can be either tangible or intangible. Table 1 presents an example of goals, sub-goals and Objectives corresponding to sub-goals. Each of the objectives should be translated into an innovation project proposal. Notice the deliverables are very different from deliverables mentioned in most project proposals.

Table 1 Linking Goals to objectives

Goals	Sub-Goals	Objectives ¹
Tangible	Improve Profitability	Increase net profit per sale by 10 %
	Increase Volume	Increase sales volume by 20 %
	Provide Stability	Minimize seasonal variance to under 1%
	Improve company image	Increase contributions to community by 5 %

¹ We do not reflect time frames and resource allocated in this table.

Intangible	Enhance environment	Obtain gold level certification
	Enhance quality of life	Give employees 3 hours free time per week to engage in fitness programs.

Values of a company are the guiding principles for the conduct of the business. Any innovation proposal that violates the values of a company should not be a part of its innovation portfolio.

3 Leadership Styles, Value Disciplines and Risk Appetites of a company

Every company whether implicitly or otherwise embraces some permutation of leadership style, value discipline and risk appetite. A specific triad of leadership style, value discipline and risk appetite will influence the attitude and hence the actions of a company towards its decisions regarding innovation proposals. We discuss the different types of leadership styles, value disciplines and risk appetites in the following subsections.

3.1 Types of leadership style

There are four different leadership styles that can be assumed by companies. These are Profit maximizing leadership, Asset utilization leadership, Growth focused leadership and agility focused leadership. We discuss each of these leadership styles and the consequent behavior of a company in the following subsections.

3.1.1 Profit maximization leadership

Profit oriented leaders will manage innovation and business architectures to drive down business costs. They will typically establish centralized organization to manage infrastructure, architecture, and shared services. They will also transparently balance the needs of the corporate and the operational units for business needs. Such leadership will generally adopt a centralized approach towards the coordination and approval of innovation related investments.

3.1.2 Asset utilization leadership

Asset oriented leaders will design business and innovation architecture based on a shared infrastructure. They will get business units and operational units to commit to the use of shared infrastructure and will strive to optimize the utilization of shared infrastructure. Such leaders will ensure asset utilization and reuse is given a higher weightage in innovation investment decisions. They will ensure that the current assets are maximally utilized before investing in new assets. They will also institute educational programs to train operational units on the use of innovations maximizing asset utilization.

3.1.3 Growth focused leadership

Growth oriented leaders will empower business units to drive investments in innovations in response to market opportunities. They will decentralize organization for critical business processes. They will charge the business units with the responsibility to meet internal and external customer needs. They will be quite comfortable with the creation of locally optimized infrastructures. They are bound to track business value of innovations formally. They will educate operational units on the use of innovations for growth.

3.1.4 Agility focused leadership

Agility focused leaders will ensure that the business and technology infrastructures are flexible enough for rapid reconfiguration and reuse. Given that such leaders operate in intensely competitive markets, they will strike a balance between central decision making and business unit decision making. While they will retain the control for decisions regarding shared infrastructure and emphasize on the flexibility or plug and play nature of the infrastructure, they will empower business units to decide on their own mechanisms for speedy response to the changing market conditions. Innovation projects are likely to be managed by nuclear teams made of cross-functional expertise.

3.2 Types of value disciplines

There are at least three different types of value disciplines a company could adopt. These are described in some detail in the following subsections.

3.2.1 Operational Excellence

Companies pursuing operational excellence design their business processes to ensure end to end supply chain optimization and will place a lot of emphasis on efficiency and reliability of the business processes. They will retain critical skills at the center of the organization and will offer low level empowerment to other units. They will place a lot of importance on quality control, will adopt command and control style of management and will establish standard operating procedures for all their processes. They will achieve relatively larger return on their assets relative to other types of value disciplines.

3.2.2 Customer Intimacy

Companies pursuing customer intimacy as a value discipline will design their business processes to emphasize on flexibility and responsiveness for customer support and market place management. They will place critical skills at the boundary of the organization, typically at customer touch points. They will focus on achieving higher scores on customer satisfaction and will pursue life time value derived from each customer. They will establish single view of every customer across all their business units. Given their investments to achieve higher levels of customer satisfactions, their profit margins will be relative lower and will therefore have to constantly increase their customer base.

3.2.3 Product / Service Leadership

Companies focused on product or service leadership will emphasize on constant innovation, time to market and market communications. They will allow critical skills to

be organized in loosely knit units. They will establish programs to reward innovative behavior and will also put in place risk and exposure management programmes. Such companies will develop and maintain systems that promote collaboration across boundaries. Product or Service leadership oriented companies will generally experience a better market cap although their return on investments and assets may not be as stellar as companies following other value disciplines.

3.3 Risk Appetite

A company's ability to identify, manage or assume risks will be an important input in their decision making process to either support or dismiss certain type of innovation proposals. Clearly growth oriented leadership that is focused on product or service leadership as a value discipline will have much more risk appetite than the others.

3.3.1 Risk management principles

Risks can be managed in one of four different manners as described below.

- a. Manage the risk – Institute measures to ensure that risky activities are closely monitored and managed. In the case on innovation proposals, following lean innovation method will help manage the risks early.
- b. Transfer the risk – In certain instances, the risk can be transferred either to an actuarial vendor or a business partner. A company will need to pay a premium for transferring the risk.
- c. Assume the risk – In some cases a company may decide that the probability and the impact of the risk are so low that it may decide to assume the risk.
- d. Avoid the risk – In cases where the probability and the impact of a risk is high or very high a company may decide to avoid the risk.

Table 2 shows the different risk management options that a company may choose to adopt under different conditions. This is only a subset for illustrative purposes and should not be interpreted as the gold standard for risk management purposes.

Table 2 Selected subset of risk Management Options available to a company.

Vulnerability	Probability	Impact	Recommendation
High	High	High	Avoid the risk
High	Low to medium	High	Transfer the risk
High	High	Low to medium	Manage the risk
High	Low to medium	Low to medium	Assume the risk

3.3.2 Relative length of projects

Companies should also recognize that projects that are of longer duration are likely to be riskier than projects of shorter duration. As a result, a company may institute lower limits for longer term projects both in terms of number of projects and the total investments into such projects. One could assume a venture capital type of investment model where

longer term projects are required to be broken down into intermediate milestones and that such innovation projects be funded one milestone at a time.

4 Three innovation portfolio related dashboards

Dashboards are important visual aids for making management decisions of different kinds. In this section we introduce three dashboards that will be used in the design of innovation portfolios.

The first dashboard is the Innovation Portfolio Dashboard and an example of such a dashboard is shown in Figure 2. This example shows the number of innovation projects in play for the business divisions and the corporate level. It also indicates the minimum, maximum and actual number of projects planned for each category of innovation as well as 1, 2, and 3 year projects for both business divisions and the corporate of a company. This example uses four types of innovation proposals. In other words, the innovation portfolio has four buckets of projects – Efficiency, growth, transformation and mandatory. These are four commonly used innovation portfolio categories. The dashboard also used the red colour to indicate categories that have exceeded well above the prescribed limits, orange colour to indicate categories that have marginally exceeded the prescribed limits and green to indicate those categories within prescribed limits. We shall use the same legend for other dashboards as well.

Figure 2 Innovation Portfolio Dashboard

	Business Divisions			Corporate			Combined		
Period →	1 yr	2 yr	3 yr	1 yr	2 yr	3 yr	Total	Min	Max
Innovation Type									
Efficiency	32		4	4	3		43	10	30
Growth	20	20	1	2			43	20	40
Transformational	8			4			12	5	15
Mandatory	5			7			12	5	10
							Legend		
Maximum	70	42	8	25	10	1	Above limit		
Minimum	50	20	1	10	2	0	Marginally over limit		
Actual	75	20	5	17	3	0	Within limit		

The Innovation Portfolio Dashboard will be consulted every time an innovation proposal comes up for consideration. The maximum number of projects supportable under any of the categories will be limited by resources that include human capital and money. This can be termed as the innovation capacity of a company.

An innovation proposal that belongs to a red or orange category should generally not be supported unless there is an exceptional reason to support it. Similarly, any innovation proposal that will push a green category into an orange category should also not be supported unless there is an exceptional reason for supporting it. In either case the

exceptions should be a small fraction of the maximum number of innovation projects that a company can handle.

The second dashboard shows the relationship between the different Innovation projects and the goals of a company. Figure 3 shows the contribution of different innovation projects to the goals of the company. This dashboard allows decision makers assess the importance of an innovation proposal or project to the goals and hence the vision of the company. An innovation project may not contribute to a goal in which case we indicate ‘None’ in the corresponding cell. In this example we use “Strong”, “Moderate”, “Low” and “None” as the impact indicators. We could assign a score of 3 for “Strong”, a score of 2 for “Moderate”, a score of 1 for “Low” and a score of 0 for “None”. One could then compute the impact of an innovation proposal to the goals of the company by summing up the scores across each row. As per the scheme IP1 get a score of 2, IP2 gets a score of 6, IP3 gets a score of 13, IP4 gets a score of 7, IP5 gets a score of 4 and IP6 gets a score of 9. These scores are used to rank the different innovation proposals. This dashboard can be used to select innovation proposals to support as well as it can be used after the selection to remind the teams of the relative importance of the innovation projects to the goals of the company.

Figure 3 Innovation Portfolio Impact dashboard

Innovation Projects	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Impact score	Rank
IP1	Low	None	None	Low	None	2	6
IP2	Moderate	Low	Moderate	Low	None	6	5
IP3	Strong	Moderate	Moderate	Strong	Strong	13	1
IP4	Low	Strong	Low	Moderate	None	7	3
IP5	Strong	None	None	None	Low	4	4
IP6	Low	Moderate	Strong	Strong	None	9	2

The third dashboard captures the risk related information for the innovation projects. An example of the third dashboard is seen in Figure 4. It has two parts, both relevant to risks of the projects in the innovation portfolio. The upper part shows the minimum, maximum and the actual number of innovation projects with different levels of risk (High, Medium and Low) and the lower part indicates the minimum, maximum and the actual number of projects with long and short duration. Clearly projects that are longer duration are riskier.

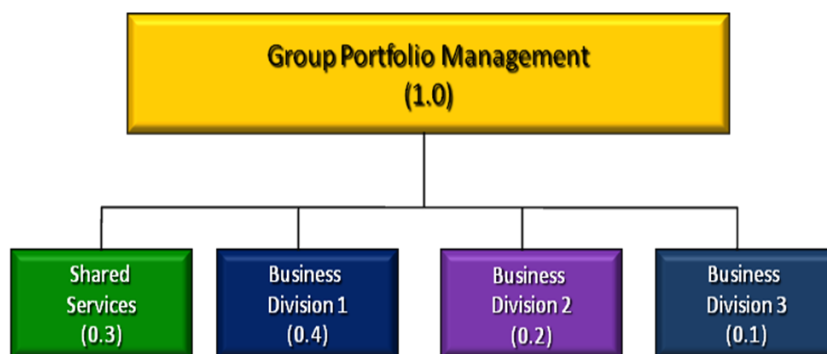
Figure 4 Innovation Portfolio Risk dashboard

	Minimum	Maximum	Actual
<i>Portfolio by risk</i>			
High risk/ Transfer	0	7	5
Medium risk / Manage	0	30	25
Low risk / Assume	20	100	70
<i>Portfolio by duration</i>			
Long	40	60	75
Short	40	80	45

An innovation proposal satisfies all the different considerations including risk. Any innovation proposal that does not fit into the risk profile defined by the innovation portfolio team should not be supported unless there are exceptional reasons for the support. As mentioned before the exceptions ought to be a very small fraction of the maximum number of projects to be supported under any one category.

In this section we also discuss the organization required for innovation portfolio management. An example of innovation portfolio management for a multidivisional company is shown in Figure 5.

Figure 5 Innovation Portfolio management for a multidivisional company



The figure shows a company with three business divisions and a central division offering shared services. The innovation portfolio budget of the company can be distributed to the different business divisions and the shared services as shown in the figure. Each business division is free to select its leadership style, value discipline and risk appetite based on the maturity of the industry in which it operated. This selection in turn will define the guiding principles for allocating the budget to the different innovation proposals for a particular business division.

For companies seriously committed to proper innovation portfolio management, it is necessary to establish a board level Innovation Subcommittee. The subcommittee can authorize the setting up of innovation portfolio management committees at the group level and also at each of the business divisions. Again, such arrangements will be dictated by the leadership style chosen by the company.

Every innovation portfolio management committee has to set up corresponding Innovation Portfolio dashboard, Innovation Impact dashboard and Innovation Portfolio Risk dashboard. The committees should decide the types of innovation proposals they will support and the minimum and maximum number of innovation proposals that they can support at any given time. The numbers will be decided based on the goals of the company. These numbers will define the innovation capacity of the company. These numbers will be used to populate the Innovation Portfolio dashboard. They should then construct and maintain the Innovation Impact dashboard. They should also define the minimum and maximum numbers for the high, medium and low risk categories of innovation proposals as well as the number of long and short duration innovation

proposals. The company as a whole should define a risk scoring method to be used by all its divisions. The committee should also define the guidelines for handling exceptions and the actual number of exceptions permitted for each innovation category. Setting up of the categories of innovation proposals to be supported and the minimum and maximum numbers of innovation proposals to be supported, the risk levels and the long and short duration innovation projects will be collectively called innovation portfolio architecture. The chosen value discipline will dictate the importance and priority to be assigned to each of the innovation types. Innovation Portfolios can be architected both at the group level and at the individual business division level.

The structure of an organization for managing Innovation Portfolio and the resulting considerations will depend largely on the leadership style and value discipline practiced by an organization. Table 3 presents some examples of structuring the organization and priorities of Innovation Portfolio Management Office (IPMO).

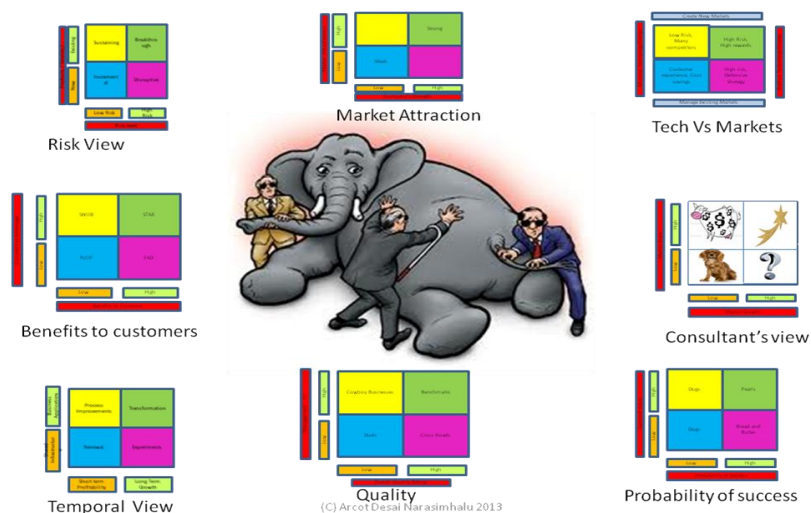
Table 3 Influence of Leadership style, Value discipline on IPMO

Leadership Style ↓	Value Discipline		
	Operational Excellence	Customer Intimacy	Product / Service Leadership
Profit Maximization	Centralized IPMO with emphasis on process innovations	Centralized IPMO with emphasis on increasing customer satisfaction.	Centralized IPMO with emphasis on proposals reducing costs.
Asset Utilization	Centralized IPMO with emphasis on minimum investments into acquiring new assets.	Centralized IPMO with emphasis on redeploying current assets for customer facing applications.	Centralized IPMO with emphasis on utilization of assets for product and service innovations.
Growth focused	Central IPMO for shared services and empowered business division IPMOs with freedom to have local infrastructures.	Empowered business IPMOs with emphasis on innovations that increase customer base, customer retention and value per customer	Business IPMOs focused on creating new products and services to increase revenues guided by a very lean central IPMO
Agility focused	Central IPMO with emphasis on easily reconfigurable shared services and empowered business IPMOs that are responsive to market opportunities.	Empowered business IPMOs with emphasis on shorter go to market and development times .	Totally empowered business IPMOs focused on incremental and disruptive product and service innovations.

5 Designing optimal innovation portfolio

We are now well poised to design a method for the optimal innovation portfolio of a company. When we review practice and academic literature we find a plethora of approaches to investment portfolios as shown in Figure 6. It is clear none of them appear to directly align investments with the vision and goals of a company.

Figure 6 Different approaches to designing innovation portfolios



The following is a common classification of innovation types.

Mandatory: Innovations falling under this category are generally of two major types. The first type of innovation is compliance related. Regulation and deregulation often requires innovations that are either products processes or services. The other type of innovations arises due to competitive necessities. These are innovations required to catch up with market leaders in the industry that a company or its business division operates. The second type of mandatory innovation will rarely happen if a company has managed its innovations well in the past.

Efficiency: The second innovation category that most organizations need to support is efficiency directed. These are often process innovations that tend to minimize either errors or wastages of other kinds. Six Sigma, TQM and other equivalent methods are used to identify these opportunities.

Growth: Growth oriented innovations form the third category. These innovations allow market expansion and often support incremental innovations for existing product or service categories in order to maintain or improve both the revenues and the market leadership of a company.

Transformational: These innovations change the very nature of the products and or services that a company offers. An example is General Motors introduction of GMAC financial services as a means of boosting the sales of its cars. It is interesting that GM derived more profits from its financial services division than it automobile division during some years.

The above types of innovations will be used for further discussions in this section. However, companies are free to decide on how they wish to categorize the types of innovations.

Table 4 shows how an innovation budget of X could be allocated across the different divisions of a company and how then each of the divisions can allocate the budget across the different types of innovation proposals.

Table 4 An example of Innovation budget allocation

Divisions →	Shared Services	Business Division 1	Business Division 2	Business Division 3
Proportion of innovation budget allocated	0.3 X	0.4 X	0.2X	0.1 X
Innovation types or buckets ↓				
Mandatory	0.05 X	0.2 X	0 X	0
Efficiency	0.1 X	0.1 X	0.05 X	0
Growth	0.1 X	0.15 X	0.1 X	0.05 X
Transformational	0.05 X	0.05 X	0.05 X	0.05 X

The budget allocations reflect the nature of the business divisions. For example, Business Division 1 had allocated almost half its budget for Mandatory innovations. This could be interpreted as either they need to comply with some new regulations or that they are well behind market leaders and hence need to catch up quickly. The same division also has set aside a significant part of the budget for growth as opposed to Business Division 3. The level of support for Business Division 3 indicates that it is either a mature market leader or could be in a sunset industry and hence the lower budget allocation.

Table 5 presents an example that maps the different innovation proposals to the Goals of a company. It is clear that some innovation proposals may contribute to more than on objective belonging to different goals.

Table 5 Contribution of innovation proposals to different goals of a company

Innovation Proposals	Business Unit	Innovation type	Goal 1		Goal 2		Goal 3	
			OBJ11	OBJ12	OBJ21	OBJ22	OBJ31	OBJ32
IP1	BU1	Mandatory	x			x	x	
IP2	BU2	Growth		x				
IP3	BU1	Efficiency			x			
IP4	BU1	Growth						x
IP5	BU2	Transformational				x		
IP6	SSU	Efficiency		x				x

5.1 Method for designing an innovation portfolio for a company

In this section we provide a method for constructing or designing the innovation portfolio of a company

- a. Enumerate / review / refresh the vision of the company
- b. Identify the goals that are required to achieve the vision of the company
- c. Break up each goal into one or more Objectives.
- d. Invite Innovation proposals from the employees and other stakeholders such as business partners.
- e. Construct a table such as Table 4 to remove any Innovation Proposal that is not aligned to any of the goals of the company.
- f. Determine the priorities of innovation proposals using either the method described in Table 3 or any other method that takes into account financial, timelines, and quality requirements.
- g. List the resource requirements of each of the innovation proposals.
- h. Determine the risk score and risk profile of each of the innovation proposal.
- i. Approve all innovation proposals that are mandatory and determine the residual budget.
- j. Select the rest of the innovation proposals as per the following process
 - Repeat
 - Consider the next highest ranked innovation proposal
 - Select it if it falls within the minimum and maximum number of projects of the corresponding innovation type in the Innovation Portfolio Dashboard as well as within the minimum and maximum number of projects for the risk type and duration in the Innovation Risk Dashboard
 - Allocate the budget for the selected proposal if its resource requirements are within the residual budget and compute the residual budget.
 - Skip this innovation proposal if the residual budget is smaller than the resources required.

Until all the qualifying innovation proposals are approved or there is insufficient budget.

6 Summary and conclusions

This paper has identified leadership style, value discipline and risk appetite of an organization as major inputs for determining the budget allocation to the different types of innovation proposals that are aligned to the vision, goals and objectives of a company. It has also defined three different dashboards that are to be used in the selection of innovation proposals. It then discussed a method for budget allocation to common shared resources and business divisions based on the leadership style and value discipline of the company. It also described a method of determining the priorities of the innovation proposals based on their alignment to the goals of the company.

Although we discuss all this in relation to a company, the same principles can be applied to any organization including governments, Non-profits and Non-governmental. We hope that this paper would be a good source for innovation portfolio managers as a means of ensuring that innovation proposals that are supported contribute to achieving the vision of the organization.

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