Global Journals LaTeX JournalKaleidoscope™
Artificial Intelligence formulated this projection for compatibility purposes from the original article published at Global Journals. However, this technology is currently in beta. *Therefore, kindly ignore odd layouts, missed formulae, text, tables, or figures.*

Developing Key Performance Indicators from Mission and Vision Statements of an Engineering College in Oman

Ilango Sivaraman[1]

[1] Caledonian College of Engineeering

Received: 6 December 2013 Accepted: 3 January 2014 Published: 15 January 2014

Abstract

The purpose of this paper is to trace the method of developing the Key Performance Indicators (KPI) from the Mission and Vision statements of an Engineering College in Muscat, Oman. In this context, KPIs provides parameters for measuring the quality and standards of the institute. For an educational institute the KPIs extend into areas that are beyond the realm of financial fields as the primary aim here is to develop students from the high schools in to responsible and capable engineers and the monitory returns, perhaps, take a very important second position status

Index terms— KPI, stakeholders, engineering college.

1 Introduction

he private Engineering college in which, this study was undertaken is located in Muscat. The college has a student population of over 2000 and strength of over 100 teaching staff. The College has three Engineering departments with supporting departments such as Maths and Educational and Professional departments.

The college offers a two year diploma and a four year honours degree programs to all students succ-esssfully finishing their high school secondary education programs.

The Mission and Vision statements of the college are in the public domain and are available in the college website.

2 II. Mission and Vision Statements

"The indispensable first step to getting the lawyer, and commentator on political and economic issues. things you want out of life is this: Decide what you want"-To quote, Ben Stein, an American actor, writer,

In the case of higher education institutes, deciding what you want -is a complex procedure. This is precisely because, the stake holders are so varied and many, and their expectations also can be wide ranging. In this context, it is essential to decide or list the expectations and develop a system for their measurement. The list of expectations can be drawn by the management of the institutes, who should be well aware of the expectations of all the stake holders. Generally the expectations are transcribed as Missions and Visions of the college Therefore, the KPIs are a derivative of Missions and Visions of the college or the Universities concerned.

The statements of Mission (What we are doing now?), Vision (what can be our destination), values and objectives, become the working platform for identifying the Key Performance Indicators (KPI) of any corporate or Institution.

The Mission and Vision statements of the college are given below:

3 Table 1 : Mission and Vision statement of the college

Authors ? ? ?: Caledonian College of Engineeering. e-mail: ilango.sivaraman@gmail.com (SERDAR, A.M, 2010) Mentions that "As a result we collected information regarding the vision, mission and goals of the institution that were the basis for defining critical success factors and the set of key performance indicators".

KPIs should be clearly linked to the strategy, i.e. the things that matter the most. Once you have agreed, defined and mapped your strategic objectives you can design KPIs to track progress and gain relevant insights to help manage and improve performance. (MARR, B., 2010)

Further as per the workshop organized by Ministry of Higher Education(Oman) and Oman Academic Accreditation Authority(OAAA), Key performance indicators are related to goals or objectives and provide means for tracking performance against these goals or objectives (PALERMO, J. and Carroll, M., 2006).

In the case of higher education institutes, there are several non-financial parameters or KPIs, like the quality of teaching, student learning, student satisfaction employability etc., which should also be monitored and measured along with financial metrics to get a balanced view of the performance.

4 III. Balanced Score Card (BSC)

The way forward was first proposed in the early 90s, by Drs. Kaplan and Norton of Harvard Business School and is referred as Balanced Score Card (BSC).

The characteristic of the balanced scorecard and its derivatives is the presentation of a mixture of financial and non-financial measures each compared to a 'target' value within a single concise report. The report is not meant to be a replacement for traditional financial or operational reports but a succinct summary that captures the information most relevant to those reading it. It is the method by which this 'most relevant' information is determined (i.e., the design processes used to select the content) that most differentiates the various versions of the tool in circulation. The balanced scorecard also gives light to the company's vision and mission. These two elements must always be referred to when preparing a balance scorecard. (http://en.wikipedia.org/wiki/Balanced_scorecard, 2013). This is further reiterated by (NEFSTEAD, E.W and Gillard, A.S, 2006).Generally these financial measures report on outcomes, also known as lagging indicators. This after-the-fact approach, does not communicate the real drivers of future performance. What is needed is to define and manage indicators that show value through investments in students, faculty, staff, technology and innovation. How do we (the enterprise or the institute) look to stake holders? is the main point in this element of BSC. In the case of an Engineering college, the main stake holders are the management, the students and the staff members of the college.Others include the Ministry (Government), the parents, the employers and even the society in which the college is located.

The financial perspectives would include, for instance, the number of students, (hence the income), the expenses, cash flow, the funds from research and consultancy, the grant /aid from the Govt., etc. However, the financial perspectives are not considered, in this paper as these are quantitative figures and are easily measured by regular financial reports.

5 b) Customers Perspectives

How do customers see us? -is the main focus in this category. For an Engineering college, the main customers are the students in the college. The student's perspective of the college and their learning experience in the college are taken into account, while framing the KPIs. The employers perspective of the product (student), is also taken in to account while designing the key performance indicator in this section. what must we excel at? -is thetheme in this element of BSC. The internal processes and internal growth perspectives show how the organization creates the outcomes of Financial and Customers perspectives. This way, managers can identify a causal chain from the performance drivers to financial outcomes. In the case of the college,the internal process perspective relate to the quality of the teaching staff, the quality of teaching, the research and consultancy work, the operational excellence, etc.,

6 d) Learning and Growth perspective

How can we continue to improve and create value? The set of KPIs look at the institute as a whole and relate to the vision of the college and how the Board, Management and staff learn from their own experience and take the path towards growth. The staff development activities, Currency of the programs of the college, etc., come under this set of KPIs.

The financial perspectives are perhaps easier to measure interms of income, expenditure and return on investment etc. The focus here is to develop and classify the KPIs for the Engineering College as per the remaining categories of BSC.

7 IV. KPIS from the Mission Statement of the College

Consider the mission statement of the college:

To provide an innovative, creative and environmentally-awarelearning experience for those who seek technological education.

The words in bold italics reflects the colleges'-/Managements' perception of their existing operation. The task is to develop KPIs that would measure the performance of the college with respect to their objective of offering an innovative, creative and environmentally-aware learning experience to the students of the college.

The impact of mission statement should be viewed from the stakeholder's point of view. A possible list of the stakeholders for an Engineering college is given below. From the above list of stakeholders, the three primary

stakeholders are students, teaching staff and the management of the college who are involved in the day to day functioning of the college. For the purpose of this research, these three primary stakeholders are considered, while developing the framework of KPIs.

Translating the mission statement key words into a table, we get the following.

There is an interconnection and interdependencies between the three primary stakeholders, in terms of teaching, research and knowledge transfer.

As per Jongbloed et al (**??**008), one plausible consequence of such interdependent relationship is that it would require anew governance and accountability approach, highly professional management and are thinking of the university's business concept.

Further as reported by these authors, that is the way in which the university/College creates value and how it assesses its value (de Boer et al. **??**007).

The interdependent relationships with respect to the Mission derivative of creativity and innovation is illustrated in the following scheme (Figure **??**.4) As per Oxfords Advanced learners dictionary Creativity is involving the use of skill and the imagination to produce something new or a work of art and innovation is the introduction of new things, ideas or ways of doing something.

Examining more closely, to understand the difference between creativity and innovation, -Creativity refers to the ability to come up with new ideas, the ability to think widely, to have a free and open mind and to approach matters in a new way, whereas innovation is the ability to confine the creative ideas and make them turn into reality so as to achieve successful performance.

Considering the defined meanings of creativity and innovation, it is to be noted that the driving force for innovation is creativity and innovation is measurable as compared to creativity, as creativity is a thought process and innovation is converting the thought process in to an effective action. According to (Ned, 2007), Innovation is the result of creative activity, however all creativity does not necessarily lead to innovation.

We shall, in this chapter, identify KPI's that enhance the institutional climate to facilitate innovation and creativity. This will be seen from the perspectives of the three main stakeholders (i. e) the students, the staff and the management of the college.

8 a) KPIs for enhancing institutional climate to facilitate innovation and creativity

i. Developing KPI on creativity and innovation-from the student's viewpoint.

As per the report 'Creative and Innovative good practices in compulsory education in Europe' (Shakuntala, 2010) group work on cross-curricular project on a given theme embedded in formal assessment, develops creativity and innovation among students.

Taking a cue from the above theme, a cross curricular project opportunity given to the students could be a source for measuring the students' creativity and innovation.

The assignments and exam assessments measure the students understanding of concepts, applications, and memory, but, the student's innovation can be measured, in modules, where the students are given open ended tasks, (like in projects) that provide room for students expression of creativity and innovation. In an educational context(Ned, 2007), the development of creativity is not dependent on the random ignition of the 'spark of genius 'but rather on equipping the students with tools, techniques and conceptual strategies to harness the inner creative flame.

A report (Karlyn, 2006) recommends that the usage of problem and project based learning has shown significant promise to increase a broad range of thinking abilities, including creative thinking, and help link education to relevant ill defined, real life experience.

In a project module the problem formulation is by the student and it does not warrant a single best answer, as applicable to most of the other modules that the students go through in their selected program or discipline in Engineering.

The following modules of the Engineering College, allow the students to conceive their own ideas, formulate it as a project problem, analyse, design and express them in the form of prototypes or models or simulated solutions -thus giving a vent to express their creative ideas in the form of possible innovative projects. Therefore, the number of modules available and the number of students taking up the modules can provide an indication of the creative and innovative learning experience experienced by the students. The first three modules also promote team work and group learning concepts.

Further projects undertaken by the students that involve 'environment and its impact' can become one of themeasurable indicators for 'environmentally aware learning experience of the students.

Another indicator for the measurement, is the number of projects from the above modules that is

9 Global Journal of Management and Business Research

Volume XIV Issue I Version I Year ( ) A recognized by the staff of the college as a good one,and sent for any competition or exhibited in a conference /workshop /gathering.

While projects such as above helps us to identify creativity and innovation in students'work, the higher education institutes also need to provide an atmosphere that foster creativity. Student mobility (Jan., 2008)is

the key component of shared learning, creativity and increases the flow and sharing of knowledge between institutions, helping them to break out of national or local patterns.

In Europe under a program known as 'Erasmus' (EuRopean Community Action Scheme for the Mobility of University Students) now known as Lifelong learning program, students and staff have exchange programs with partnering universities in different countries and as per the surveys (Anon., 2011)conducted ,it is believed that such program fosters creativity and innovation in learning and teaching.

Therefore, on the basis of the above, an additional indicator for innovation and creativity is the number of students sent to other universities on exchange programs. To summarise the following are the three key performance indicators that fosters innovation and creativity among the students.

All KPI measurements in the lists that follow are quantitative. However, the reflection is qualitative. For instance, in table 3.5, the first KPI measurement is number of projects displayed in the project fairs and competitions. This number is not merely quantitative, as only a few good projects go up by a notch and qualify to be exhibited in the fairs and competitions. Hence careful consideration is given, in such a way that the numbers also reflect a qualitative measurement.

Thus the numbers are tweaked to represent the qualitative aspect of the KPI measured.

10 Each student KPI is coded as St.

Under the same umbrella of creativity and innovation, we have to envision the roles of the staff and management in nurturing creativity and innovation and accordingly decide on the KPIs for these two stakeholders.

11 ii. Developing KPIs from the staffs 'point of view

According to Wikipedia, the term Research and Development, reflects two primary models. One model is to develop new products and in the other model, the primary function of an R&D group is to discover and create new knowledge about scientific and technological topics for the purpose of uncovering and enabling development of valuable new products, processes, and services.

The higher education institutes are considered to be the primary breeding ground for research, thereby promoting creativity and innovation.

As per the report of the strategy group titled 'National Strategy for Higher Education to 2030' (Ireland) "The exposure of all students to the passion and insights of research-active academic staff can be a special force for personal development and creativity (Anon., 2011)" Universities / Colleges also promote consultancy opportunities of their teaching faculty. The consultancy involves the staff member to provide a professional or technical service to benefit a specific client on the consideration of certain amount of payment. It has been found that faculty with consulting experience are often more effective in the classroom (Whitford 2000 cited in Shugan, S, M).The same author also goes on to say that outside consulting activities can produce valuable input for academic research.

Considering these aspects, KPIs from these two specific areas of research and consultancies by the academic staff of the college are taken in to account. Each staff KPI is coded as Stf.

Developing Key Performance Indicators from Mission and Vision Statements of an Engineering College in

iii. Developing KPIs from the viewpoints of Leadership/ Management of the institute The management of an institution plays a pivotal role in meeting the challenges of the environment and its capacity to respond innovatively so that all the stakeholders benefit from the foresight of the management.

The direct transfer (Kroll, 2012)of know-how by patenting and licensing and technological innovations among other things, depend on the university itselfand the university management plays a major role in invigorating and sustaining the creative climate in the institute.

The institutions that understand the true value of professional development, culture, innovation and creativity also recognize the value of continuously educating their employee base. These organizations are the ones that will be better positioned to adapt to the rapidly changing demands of today's work environment.

Higher education has become a part of internationalization **??**Qiang, 2003) It is believed that Internationalization in higher education is an inevitable result of the globalized and knowledge-based economy of the 21st century and staff exchanges, university linkages, patterns of mobility, and international and regional arrangements among universities to a great extent contribute towards diversity and promote innovation and creativity among the staff members. For such staff exchanges to take place, the management should come to an agreement with other existing universities and colleges that transcend beyond the national borders.

Across Europe (Erasmus program), USA (Atlantis & Fulbright programs), in Australia and also in other countries including India, the importance of staff exchange programs are recognized and mechanisms/agreements are in place to facilitate staff exchange programs.

In consideration of above factors, M2(KPI for Management-Refer table 3.7) is included as one of the KPIs from Management point of view. To understand the depth in the measurement of such programs, we must have the number of such programs and the number of staff, taking part in such programs.

In relation to the academic conferences/Seminars/ workshops, it is said that innovation and providing cutting-edge services cannot happen without the opportunities to see what is beyond the walls of the Library.((Gibson, 2013).Staff and students attending such events share and carry ideas that promotes contribution to their own

creation of literature and future direction of studies. With this as a background M3 (KPI for Management-Refer table3.7) is added.

The future of innovation will be more characterised by interaction of organization and society **??**Roolf, 2009). Taking a cue, we need to have ideas, innovation and creative methods that sprout due to interactions with other affiliates engaged in similar field of work. With this concept, KPI, M 5 and M6 (Refer table 3.7)are introduced.

To ensure that the interactions with the affiliates remain active, the measurement includes, the number of affiliates active during the year (M6) Each Management KPI is coded as M

The listed KPIs can be in place only at the behest of the institutions' management.

The essence of this chapter was to find the originating source for identifications of KPIs of an engineering college .As the literatures evidences, the Mission and Vision statements of the college lights up the preliminary pathway towards setting up the KPIs.

For the Engineering College that is taken up, based on the Mission and Vision statements, we could identify 14 KPIs from the perspectives of the three identified stake holders' i.e students, staff and the management of the college. From the above table, it is evident that many of the Managements' initiatives that form the core of KPIs (for Management) cover the three strategic areas as out lined in the Strategy map concept of Dr. Kaplan and Dr. Norton.

12 These are tabulated together in the

13 Conclusion:

The paper shows that the Mission and Vision statements are not coined as a show case for the public but can transform the organization to a potentially performing one. The elements for measuring the performance are embedded in the Mission and Vision statements.

It also lends credence to the statements themselves as they are not merely ornamental in application but has functional implications.

It is possible to add weightage to the KPIs which are classified in the strategic map as per above table 9. The weightage is given by the management and staff as per the importance of KPI to the college.

With proper dash board software, it is possible to monitor the KPIs for effective performance measurement of each of the element and the individual KPI. [1] [2]

1 

Figure 1: Figure 1 :

[1] © 2014 Global Journals Inc. (US)

[2] © 2014 Global Journals Inc. (US)Table 4 : Innovative learning experience

2

To address these issues the
BSC was developed by Kaplan and Norton to help overcome limitations of managing only with financial indicators.

[Note: A]

Figure 2: Table 2 :

3

S.No	Stakeholder
1	Students studying in the college
2	Staff members of the college
3	Management of the college
4	Ministry /Government departments connected with the policy/procedures of education
5	Employers /Business/Industry
6	Parents of the students
7	High schools (feeders for the college)
8	Board of trustees
9	Residents of the college location(Community)
10	Alumni of the college
11	Affiliates/Research associates/professional associations
12	Sponsors (For scholarship/welfare)

The list is not an exhaustive one

Figure 3: Table 3 :

5

S.No	Modules that provide open ended tasks for students	Level (Year)	Remarks
1	Engineering applications	1	Team project-students are allowed to form their own teams (about 5 members) and design and develop a working model.
2	Project Methodology	3	Team project-students are allowed to form their own teams(about 3 members) and choose a project for study, design and fabrication of a working prototype Module offered to Telecommunication programs.
3	Mechatronic case studies	4	Team project-Students are allowed to form their own teams (about 2 members) and choose a mechatronic project for study, design and fabrication of working model.
4	Technical Project	4	Individual project -Student should identify a project preferably in his selected program and study/analyse/and present a research report.

Figure 4: Table 5 :

6

No	Indicator / KPI Code	KPI Measurement
1	Student Projects	St1Number of projects displayed in the project fairs/competitions
2	Student projects awarded-students/	St2Number of projects that earned recognition by way of prizes and certificates
3	Student projects with environment as theme-students	St3Number of projects that has environment or non renewable energy as the theme
4	Student exchange programs-students	St4Number of students participating in student exchange programs -student mobility.

Figure 5: Table 6 :

7

No	Indicator/KPI code	KPI Measurement
5	Active Research	Stf1Number of Journal papers from the teaching staff. Stf2 Number of collaborative research projects undertaken
6	Consultancy projects	Stf3Number of active consultancy projects awarded to the college. Stf4 Number of research proposals submitted.

Figure 6: Table 7 :

8

No	Indicator/KPI code	KPI Measurement
7	Staff development programs	M1Number of staff development programs organized per year
8	Staff exchange programs	M2Number of staff exchange programs organized per year M3 Number of staff taking part per year in the staff exchange programs
9	Conferences /Seminars /Workshops.	M4Number of conferences /seminars organized per year.
10	Affiliations/Associations	M5 Number of affiliations / Associations valid during the year. M6 Number of affiliations/Associations active during the year.

Figure 7: Table 8 :

as

Year
Volume XIV Issue I Version I
( )
Global Journal of Management and Business Research

below: b) Summary of KPIs from the Mission and Vision statements of the college

[Note: A]

Figure 8: Table as

9

S.No	Students'KPI Measurement	Classification as per Strategy Map concept
1	St.1Number of projects displayed in the project fairs/competitions	Learning and growth perspective
2	St.2Number of projects that earned recognition by way of prizes and certificates	Learning and growth perspective
3	St.3Number of projects that has environment or non-renewable energy as the theme	Learning and growth perspective
4	St.4Number of students participating in student exchange programs -student mobility.	Learning and growth perspective
No	Staff KPI Measurement	
5	Stf1Number of Journal papers from the teaching staff. Stf2Number of collaborative research projects undertaken	Internal perspective
6	Stf3.Number of active consultancy projects awarded to the college. Stf4.Number of research proposals submitted.	Internal perspective
No	Management KPI Measurement	
7	M1Number of staff development programs organized per year.	Learning and growth, Internal & Stakeholder perspective.
8	M2Number of staff exchange programs organized per year M3. Number of staff taking part per year	Learning and growth, Internal & Stakeholder perspective.
9	M4. Number of conferences /seminars and workshops organized per year.	Learning and growth, Internal & Stakeholder perspective.
10	M.5 Number of affiliations / Associations valid during the year. M.6 Number of affiliations/Associations active during the year.	Learning and growth, Internal & Stakeholder perspective.

Figure 9: Table 9 :

13 CONCLUSION:

[Consulting, research and consulting research. Marketing science ()] *Consulting, research and consulting research. Marketing science*, 2004. 23 p. . (References Références Referencias 1. 2004, w. 2. c.i. S.)

[Kroll ()] 'Developing new roles for higher education institutions in structurally-fragmented regional innovation systems'. H S Kroll . *Fraunhofer Institute for Systems and innovation research ISI*, (Karlsruhe) 2012.

[Anon ()] *Interim Evaluation of the Lifelong learning program 2007-13, s.l.: EUROPEAN COMMISSION-Directorate general for education and culture*, Anon . 2011.

[Gibson ()] *MSKCC Library Blog*, D Gibson . https://library.mskcc.org/blog/2013/[Accessed28 2013.

[Anon ()] *National strategy for higher education to 2030, Dublin: Department of Education and Skills*, Anon . 2011.

[Jan (2008)] *REPORT OF THE HIGH LEVEL EXPERT FORUM ON MOBILITY*, F Jan . http://ec.europa.eu/education/doc/2008/mobil-ityreport_en.pdf 2008. May 2013 2013. (Accessed Tuesday)

[Karlyn ()] *The sources of innovation and creativity, s.l.: National centre for education and economy*, A Karlyn . 2006.