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# KM METRICS FOR MANAGEMENT EDUCATIONAL INSTITUTIONS

## A STUDY

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*GLOBALIZATION* has thrown open various challenges not only to the corporate sector but also to the management educational institutions in India. They can no longer even rely on the knowledge of what is working 'now', as they face the risk of becoming extinct if they do not constantly adapt to the new world evolving around them. In today's knowledge economy, be it organizations or management institutions they need to constantly process existing information and knowledge, while creating new information and knowledge all resulting in *continuous innovation* be it technical, product, strategic or organizational innovation. In short the need of the hour is '*organizational knowledge creation'* and a set of metrics that can help management institutions to assess how well they are creating this life sustaining 'organizational knowledge'.

This prompted us to use the dynamic model of "organizational knowledge creation", namely the SECI model, proposed by Ikujurio Nonaka and Hirotaka Takeuchi, of Japan. SECI is the acronym for Socialization, Externalization, Combination, Internalization the four knowledge creating activities in an organization. This study intends to develop a set of knowledge management metrics for management educational institutions, through a survey of Directors/Heads of 103 B-schools/affiliated colleges in Andhra Pradesh. The metric will help management institutions to assess their present performance, and to benchmark themselves in a knowledge driven economy.

## Introduction

Globalization has compelled businesses of all sizes and virtually all industries to review and rethink their strategies about every aspect of their business. They can no longer even rely on the knowledge of what is working 'now', as they face the constant risk of becoming extinct if they do not constantly adapt to the new world evolving around them. Drucker (1995) points out that knowledge is productive only if it is applied to make a difference (rather than simply exist) and suggests that it is this productivity that is going to be the deterministic factor in the competitive position of an organization or industry. Especially true in the knowledge economy of today, which has entirely different set of characteristics. The changing demands of businesses demand constant change in the requisite knowledge skill set of the people working in these businesses. It is also expected that these changes are anticipated and provided for through management education. Universities and other higher education institutions are recognized to be in knowledge business (Goddard, 1998) and are increasingly exposed to market place pressures like any other businesses in their constant struggle to survive. Organizations and management institutions need to constantly process existing information and knowledge, while creating new

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information and knowledge all resulting in *continuous innovation* be it technical, product, strategic or organizational innovation. In short the need of the hour is '*organizational knowledge creation'* and a set of knowledge management metrics that can help management institutions to assess how well they are creating this life sustaining 'organizational knowledge' Changing times thus need new solutions and new paradigms. Is knowledge management the answer?

## Knowledge Management in Higher Educational Institutions

In simple words, Knowledge Management is all about enabling an enterprise to act as intelligently as possible to secure its viability and overall success. Quintas et al (1997), states that knowledge management a process of continually managing knowledge of all kinds to meet existing and emerging needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities. The dynamics of today's market place require effective knowledge management to assist managers in making decisions and taking actions, which enable organizational survival and prosperity. Outcomes of a knowledge management include innovation; improved performance and organizational learning (Bontis, Cossan, and Holland 2002), competitive advantage (Connor and Prahlad, 1996; Hall 1993; Rumizen 1998), to be more innovative (Nonaka and Takeuchi 1995), allow a firm to analyze and evaluate information better (Carneiro 2000) to name some.

Using knowledge management techniques and technologies in higher education is as vital as it is in the corporate sector. If done effectively, it can lead to better decision making capabilities, reduced 'product' development cycle time (for eg. curriculum development and research), improved academic and administrative services and reduced costs (Kidwell et al, 2000). Knowledge based organizations have the most to gain through knowledge management (Rowley, 2000) though effective knowledge management may require significant change in cultures and values, organizational structures and reward systems. Christopher A. Thorn (Thorn, 2001) at the Wisconsin Center for Education Research, goes a step further and explores the application of knowledge management techniques to educational information systems- particularly in support of systemic reform efforts.

Organizations that have adopted knowledge management are truly global and to excel in future, higher education institutions will also have to manage explicitly, systematically and comprehensively from a knowledge perspective (Steyn, 2004). The concept of knowledge management has also applied to online learning environments(Huang and Liaw, 2004). An institutional approach to knowledge management can thus lead to exponential improvements in a management education institution too.

## Knowledge Management Metrics and the SECI Model

In order to assess the effectiveness of knowledge management, one would need a new set of measures. Measures are vital for organizations not only to ensure that they are achieving their goals, but also to evaluate, control and improve upon their existing performance. In the emerging field of knowledge management (Liebowitz, 2000), metrics are also needed to convince management and stakeholders as to the value of knowledge management initiatives. Michael Malone (1997) of MIT stressed the need for new metrics for a new age. Ghalayini and Noble (1996) propose that measurement has undergone three phases in development. The first phase focused heavily on financial measures, shortcomings in them fueled the second stage characterized by non-financial measures. Finally what we see today is the third phase characterized by integrated use of financial and non-financial measures that facilitate decision making and foster improvements rather than just monitor performance eg. knowledge management measures. Darroch (2003) developed a measure of knowledge management behavior and practices, a first of its kind. The need of the hour is indeed a set of customized measures.

How effective a measure is depends on how well it captures the domain it is designed to measure ie. knowledge management orientation in this study. The conceptual underpinnings of these metrics are

drawn from Nonaka and Takeuchi's SECI Model (1995), one of the most influential works on knowledge management. It describes the way knowledge is generated, transferred and re-created in organizations. It has very robust epistemological foundations, emphasizes the social aspect of knowledge creation, and shows how individual insights can be leveraged by the organization and shares common ground with the work on learning organizations and organizational learning (Senge 1992; Pedler et al, 1991, 1996). In essence it highlights that knowledge management at the end of the day is all about managing people and providing them with tools and processes that enhance their productivity and not about technology initiatives, rendering it ideal for educational organizations. In brief, the model incorporates the following:

- Two forms of knowledge (tacit i.e. experiential and explicit i.e. codified)
- An interaction dynamic (transfer)
- Four "knowledge-creating" processes (socialization, externalization, combination and internalization-SECI).
- Three levels of social aggregation (individual, group, context)

The model proposes that a "knowledge creating company" consciously facilitates the interplay of tacit and explicit forms of knowledge. This is accomplished through systems and structures, and a corporate culture, which facilitate the interaction of four knowledge-creating processes-

- *Socialization*: the sharing of tacit knowledge between individuals through joint activities, physical proximity.
- *Externalization*: the expression of tacit knowledge in publicly comprehensible forms.
- *Combination*: the conversion of explicit knowledge into more complex sets of explicit knowledge: communication, dissemination and systematization of explicit knowledge.
- *Internalization*: the conversion of externalized knowledge into tacit knowledge on an individual or organizational scale. The embodiment of explicit knowledge into actions, practices, processes and strategic initiatives.

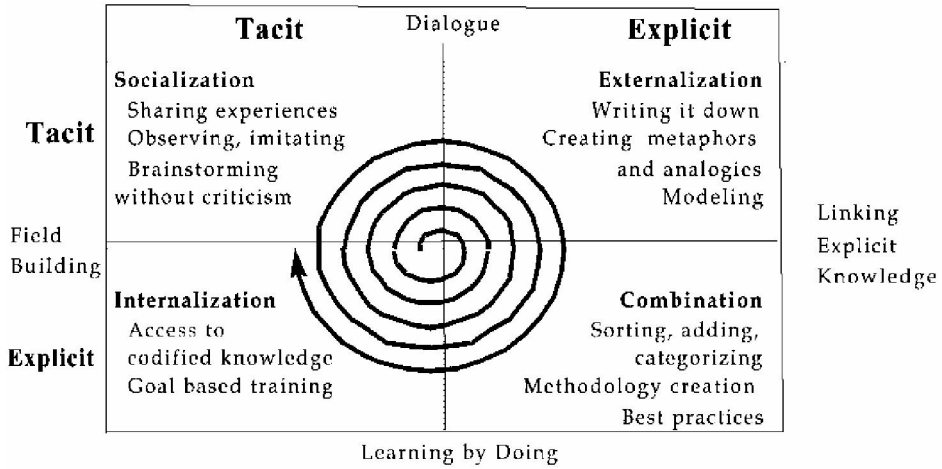


**Figure 1: The SECI knowledge spiral (Nonaka and Takeuchi, 1994)**

Critical for Nonaka is the interaction dynamic between forms of knowledge and levels of organization. He proposes that the spiral resulting from the exchange of tacit and explicit knowledge across different organizational levels is the key to knowledge creation and re-creation.

## Need for the Study

The trends in evolution of management education create a compelling requirement to adapt and change, requiring constant evaluation against new and relevant measures to evaluate the effectiveness of this change; here financial and traditional input- output based metrics alone are no longer enough. This change is reflected in the popularity of B-school rankings, wherein the quality of management education offered is judged by various key factors such as quality of faculty, curriculum, infrastructure etc. as they exert significant influence in their rankings (Sreenivasa Murthy and Vinita S, 2002). The management institutions, which will sustain competitive success in the future, are those that will measure the quality of relationships the institute has with its stakeholders-customers, employees, local community and so on. Will knowledge management measures serve this purpose? Can these non financial-measures be used to supplement traditional measure to give a much fuller picture and more relevant management progress tracking system? This paper is an attempt to develop a set of knowledge management metrics specific to Management Institutions.

## Objectives of the Study

1. To identify the broad dimensions and the items that capture the four knowledge conversion processes in management education institutions using the SECI Model of organizational knowledge creation..
2. To ascertain the importance attached by the management educational institutions to the dimensions and items identified in the study.
3. To develop Knowledge Management Metrics for Management Educational Institutions

## Methodology of the Study

As stated earlier, the SECI Model proposes that a "knowledge creating organization" consciously facilitates the interplay of tacit and explicit forms of knowledge. So first an attempt was made to identify the broad dimensions and the items that capture the four knowledge conversion processes of the SECI Model. Based on literature review and discussions certain dimensions and items were short-listed which were included in the study.

The data required for the study has been collected through primary sources. A questionnaire with 97 items in total was used to collect the data, out of these there were 30 items to measure socialization, 6 variables to measure externalization, 22 items to measure combination, 25 variables to measure internalization and 14 items to measure organizational benefits. It was administered to 103 Academic Heads/ Head of the Departments/ Directors and senior faculty of affiliated colleges in the twin cities of Hyderabad and Secunderabad, primarily of Osmania University. A total of 250 questionnaires were given out of which 145 were returned. Out of these questionnaires 103 were found to be fully complete and usable. The respondents were asked to rate these measures on their importance in capturing the concerned knowledge conversion processes of a b-school, in a 5-point Likert scale ranging from 1 to 5, where 1 implies 'Not at all Important', 2 implies 'Not Important', 3 implies 'Uncertain', 4 implies 'Important' and 5 implies 'Very Important'. Data Analysis was done using MS Excel for percentage analysis and SPSS15.0 for reliability analysis.

### *Limitations of the Study*

The study is purely exploratory and geographically restricted. There exists wide disparity in management institutes in Hyderabad and Secunderabad, with Indian School of Business, at one end of the continuum and newly mushrooming small colleges with inadequate infrastructure and faculty at the other end. It would be difficult to develop a metric which represents the two extremes of the management institutions, hence only affiliated colleges have been taken in the sample.

Typically a b-school runs an assortment of courses but for the purpose of this study we are taking

only the regular MBA Course. Also since the concept of formal knowledge management is new to management educational institutions this metric would be diagnostic in nature.

## Data Analysis, Results and Discussion

### *(i) Identification of dimensions and the items that capture SECI, the knowledge conversion processes in a management education institution*

As per the adopted framework, four knowledge conversion processes of *socialization, externalization, combination* and *internalization (SECI)* are constantly taking place in an organization. The metric should measure the effectiveness of these four processes, in order to ascertain the effectiveness of knowledge management in a management educational institution.

Coming to organizational benefits, many analysts have struggled with this issue, but it remains only partly addressed as there are so many unquantifiable, human elements in a KM system. Further, it cannot be claimed that these benefits arise solely due to knowledge management initiatives, as a host of other factors could also be responsible for contributing to these benefits. It is therefore beyond the scope of this study to come up with a set of exhaustive metrics for this objective. Thus only a limited representative set of benefits has been included in the study. Also since this metric will be more of a diagnostic metric it would be more in keeping with its objective to concentrate on the four knowledge activities mentioned above, while covering organizational benefits in totality.

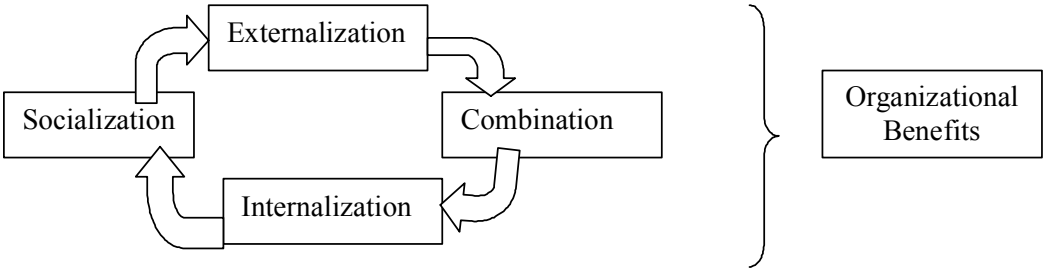


**Figure 2: Diagrammatic Representation of the domain of the Knowledge Management Construct (SECI Spiral)**

*Socialization – the tacit to tacit dimension*

In a management institution socialization takes place when students interact on a one to one basis through various types of activities like class-discussions, case studies and such other academic and co-curricular activities, which involve a face-to-face interaction among peers. Faculty tacit to tacit interaction takes place through special interest groups communities of practice, attending of seminars, workshops, meetings etc. these peer group interaction all constitute the socialization process and provide the first input to SECI spiral. Management institutes gain new knowledge from outside its boundary too like interacting with recruiters, alumni, industrial interactions etc. Tacit to tacit interactions are dependent on the quality of the participants faculty and students. Hence measures are needed for both faculty and students. The short listed knowledge management dimension for this knowledge interaction try to capture-

- Participant quality
- Initiatives taken to align tacit interactions to institutional objectives
- Financial investment in structures to improve tacit-tacit interactions
- Involvement of major participants in the tacit transactions

- On going efforts to improve quality of tacit interactions through networking
- Existence of mechanisms to encourage tacit interactions &
- Existence of infrastructural structure to encourage tacit interactions

*Externalization- the tacit to explicit dimension*

It is triggered by dialogue or collective action of the socialization process. The knowledge transfers from tacit to explicit form takes place in the form of lecture- notes, faculty web pages, faculty feed back to students in their role as knowledge disseminators. Faculty as new knowledge creators make explicit their tacit knowledge through publications of articles, books cases etc. The collaborative works of faculty as members of various special interest groups also falls in this category. Student presentations, publications, assignments, summer projects are also explicit forms of tacit knowledge. The following measures were short listed to see how a management educational institution is faring on the externalization front-

- Faculty and Student publications
- Rewards and incentives to encourage externalization

*Combination- the explicit to explicit dimension*

In terms of the SECI model combination involves the aggregation of existing explicit knowledge into a usable and valuable whole and such aggregated knowledge is a source of great value to any organization. Creation of course materials, study guides, embedded web links from faculty pages faculty personal databases are part of the combination processes of a management educational institution. Maintaining and upgrading of various databases pertaining to admission processes, pedagogical innovations, curriculum design, regulatory requirements, feedback records from student, faculty, recruiters, affiliating and accrediting bodies, external bodies like ranking and rating agencies are all an attempt to combine existing information in a more usable form. Compilation of latest competitor information and developments in management education field also fall in this category. The short listed knowledge management measures for this knowledge conversion process try to see if-

- there is a mechanism to decide the information requirements of the institution
- if the relevant explicit knowledge available
- financial expense incurred to make it available
- is information about external environment externalized
- is information about internal environment externalized

*Internalization- the explicit to tacit dimension*

This results in incorporating of best practices, improvement in academic and administrative processes, availability of relevant online database and other academic inputs, generation of required faculty training and development needs. It also provides stimulus to the generation of new inputs for the '*socialization process'*. The following measures were short listed to see how a management educational institution was faring on the combination front by assessing if

- relevant information about the management institution was being externalized.
- structures and mechanism were present to facilitate the process of internalization.
- outcomes of internalization efforts were being measured.

*Organizational benefits*

Organizational benefits intend to measure the benefits that arise due to the knowledge management activities undertaken by the management institute. At the same time it is possible that these benefits could accrue from a host of other factors i.e. other than the benefits due to knowledge management initiatives. Hence it is difficult to say that they occur benefits are a direct consequence of knowledge management, but there is no denying that knowledge management will enhance the following benefits. Further these measures due to their very nature would be outcome measures rather than in-process measures. The measures for organizational benefits were short listed under the following categories-

- Student related benefits
- Faculty related benefits
- Financial benefits
- Intangible Institutional benefits

## *(ii) Significance of Dimensions and variables identified*

The results of the administered questionnaire as shown in Appendix 1, show the importance attached by the management educational institutions to the various dimensions and variables identified in the study. The data was collected on a 5 point Likert Scale namely, 'not at all important-1', 'not important-2', 'uncertain-3', 'important-4' and 'very important-5'. It was interpreted under three broad categories namely 'unimportant-1&2', 'uncertain-3' and 'important-4&5' for analysis of the items that capture Socialization, Externalization, Combination, Internalization and Organizational Benefits.

*Socialization*

Seven dimensions with 30 items were used to capture this knowledge creating activity, 21 of these were considered as 'important' by more than 70% of the respondents.

Of the five items under the dimension **'participant quality measures'**, majority of the respondents considered the items, '*percentage of faculty with doctorates*….' (93%), '*no. of full time faculty*….' (92%) and '*industry-academic ratio'* (86%) important. The item '*no. of exceptions to admission policy*' was considered important by 50% of the respondents, with 26% considering it unimportant, while 32% were uncertain about it. The remaining item '*no. of part–time faculty*' was considered important by 42% of the respondents, while 26% considered it as unimportant, whereas 32% were uncertain about it.

Under the dimension **'Initiatives taken to align tacit interactions to institutional objectives'** all the items namely, *'inventory of need for training…*' (96%), *'faculty competence development plan'*(95%)*, and* '*clearly formulated and communicated mission…'*(93%), were considered important by majority (ie. more than 90%) of the respondents.

Five items were used to capture the dimension **'financial investment in structures to improve tacit interactions'**. The item '*training expense per faculty*' was the only item considered important by more than 70% of the respondents with 9% considering it unimportant, whereas 20% were uncertain about it, the other items namely, '*amount spent on institutional sponsorship to various associations*'(58%), '*statement of costs and benefits*'(47%), '*cost of unit of education*'(56%), '*total student expense / total fees*'(48%), were considered unimportant by roughly 20% of respondents, whereas around 30% were uncertain about them.

Under the dimension **'involvement of major participants in the decision making process'** both items, namely, '*mandatory student representation on key committees*'(81%) and '*mandatory*

*faculty representation on imp. boards'*(75%) were considered important by the majority of the respondents.

Under the dimension **'depth in quality of tacit interaction through networking'** all the items namely '*no. of student exchange programmes…*'(72%), '*no of faculty exchange programmes…*'and '*no. of linkages with national/international academic research bodies*'(78%), were rated important by majority of the respondents

Under the dimension **'existence of mechanisms to encourage tacit interactions'**, eight items were short-listed. Six of these items namely '*no. of initiatives for enhancing informal communications*'(97%), *no. of FDP's /Seminars /Conferences….. organized*'(93%), '*opportunities created for students to develop leadership qualities'* (95%), '*no. of students organizing activities/total students*'(91%), '*no. of guest lectures/industry expert interactions'*(87%), '*no of student activities organized'*(77%) were rated as important by majority of the respondents.

Of the remaining two items, '*no. of communities of special interest/ practices(CoP's*)' was considered important by only 39%, while 19% considering it unimportant, whereas 42% were uncertain about it, yet the other item, which is actually an ouput measure of the former *'ratio of number of users to number of members in the CoP'* was considered important by 51% of the respondents, with 13% considering it unimportant, whereas 36% were uncertain about it.

Under the last dimension **'infrastructural structure to encourage tacit interactions'** all the four items namely, '*no. of class-rooms with latest audio-video…*'(82%), '*no. of computers per faculty*' (82%), '*no. of computers per student*' (80%) and '*internet access to all during working hours*'(60%),were rated as important by majority of the respondents.

*Externalization*

A single dimension, **'outcomes of the process of converting tacit knowledge to explicit'** with six items was used to capture this knowledge creating activity. Majority of the respondents rated these items namely, '*per faculty contribution to subject page on intranet/internet*' (93%), '*no. of papers/ articles….*'(83%), '*no. of faculty interactive activities with industry'*(83%), *'no. of faculty awards/ recognition*'(81%) '*activities/output per CoP*' (77%) and '*no. of books…*'(68%) as important.

*Combination*

Five dimensions with 22 items were used to capture this knowledge creating activity. Under the dimension **'is the relevant explicit knowledge available'** all the items namely '*presence of faculty web page on intranet'*(90%), *'presence of library page on intranet…*'(82%), *'no. of logins to online database'*(72%), '*no. of logins to online database'*(69%), *'no. of books borrowed per student'*(69%), *' no. of books borrowed per subject'*(66%), *no. of intranet logins per student* (64% )'*no. of intranet logins per faculty'*(60%), and '*no. of intranet user-id created*(57%) were considered important

Under the dimension **'financial expense incurred to make it available'** the three items namely, '*amount of library expense per student'* (64%), *'journals + magazine…'*, (89%), '*investment in technology….*'(84%) were all considered important by majority of the respondents.

The dimensions **'externalization of external environment'** and **'externalization of internal environment'** have been considered most important by respondents as almost all the items in these dimensions namely, '*maintaining student database-admission to placements to career progression*'

(97%), '*maintaining faculty profile database'* (89%), '*maintaining recruiters database'* (88%), '*maintaining faculty expertise directory*' (78%), '*competitor information database'* (76%), '*maintaining alumni database'* (76%), '*Regulatory bodies guidelines…*'(69%), and '*directory of best practices'*(67%) were considered important by a large majority of respondents.

The remaining two dimensions **'information requirements of the institution'** and **'externalization of information about the institution'** each with one item, ie. 'data information requirement….'(65%) and 'updated institutional web- presence'(85%) respectively, were also considered important by majority of respondents.

*Internalization*

Two dimensions with seven and eighteen items respectively were used to capture the knowledge creating activity of internalization.

Under the dimension **'presence of structures and mechanism to facilitate internalization'** all the items namely '*regular faculty feedback is provided by students'* (95%), '*hours spent by management on reviewing strategy and action*' ( 93%), '*regular staff appraisals ..*'(87%), '*program quality assessment by recruiters*'(84%), '*no. of hours spent by management with HoD's…*'(77%) and '*no. of pedagogical innovations made per faculty'(76%)* were considered important by majority of respondents ie. more than 75%, with the exception of the item '*provision for regular student performance evaluation by faculty*'(57%).

Interestingly, 95% of the respondents considered '*regular faculty feedback*' important, yet only 57% rated '*provision for regular student performance evaluation by faculty*' as important to capture the knowledge creating activity of internalization.

Under the dimension **'measures of outcomes of internalization efforts'** all the items were considered important by the majority of respondents with the item '*no. of action-items reviewed after meetings between management and faculty'* considered important by 97% of the respondents.

*Organizational Benefits*

Organizational benefits were captured under four dimensions namely student **related benefits, faculty related benefits, financial benefits and intangible institutional benefits.**

Of these the dimension **'student related benefits'**, with five items namely 'increase in no. of students getting stipend...'(74%), 'increase in no. of students getting job offers from companies they did summer internship in'(91%), 'increase in no. of students getting campus placements'(99%), 'increase in no. of student academic recognitions ..'(82%) and 'increase in min,max,avg. salaries …'(69%), was considered most important by majority of the respondents.

The dimension **'intangible institutional benefits'** was the other dimension which respondents have given lot of importance reflecting the rising importance of intangibles in today's knowledge economy. Of the short-listed five items, four of them namely 'increase in no. of industry leaders recruiting…'(86%), 'increase in quality of networking allainces'(83%), 'enables the institute to analyze and evaluate information better'(76%), and 'increase in number of MD's/CEO's/COO's in alumni list'(75%) were rated important by majority of the respondents. The remaining item 'increase in proportion of applications rejected….' was considered important by 50% of the respondents, while 18% considered it unimportant, whereas 32% were uncertain about it.

The remaining two dimensions 'faculty related benefits' and 'financial benefits' had two items in each. All the items were considered important by majority of the respondents.

### *(iii) The Knowledge Management Metrics*

In this exploratory study 97 items had been included in the questionnaire, of which 92 items were rated as 'important' by majority of the respondents. Of the remaining 5 items, it was decided to drop only 2 items 'no. of part time faculty' (42%) and 'no. of communities of special interest/practices (CoP's)'(39%). The other 3 variables 'statement of costs and benefits'(47%), 'total student expense/total fees'(48%) and 'increase in proportion of applications rejected to total applications'(50%) were retained despite lack of majority ratings to help management institutions get a more holistic picture while using these metrics.

Reliability Analysis of the proposed knowledge management metric in scale alpha using the SPSS 15.0 was done for the retained items. The results of the Reliability Analysis shown in Appendix 2 indicate an overall alpha of .959. An alpha greater than 70% is considered as acceptable in an exploratory study (Nunnally, 1967). Hence, the proposed knowledge management metric is considered reliable as a measuring instrument to measure the knowledge management orientation of a management institute. The proposed metric is given in Appendix 3. The measures particularly measure a management education institute's ability to acquire/create, disseminate and use information to innovate and rapidly transform itself to meet the ever changing corporate education requirements of today's as well as of tomorrows. The suggested measures are by no means complete, but we list them as catalyst for institutions in achieving their goals.

The data collected using these measures can be used to better understand the knowledge processes of a management institute, as well as to study the consequences of adopting these measures. Further research could be undertaken to study in depth the relative importance of each knowledge creating activity ie socialization, externalization, combination and internalization from management education perspective.

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## Appendix 1

**Summary of Respondent ratings of knowledge management dimensions**

| | | | | |
|---|---|---|---|---|
| **Socialization** | | | | |
| | ***Participant quality measures*** | ***Un Imp*** | ***Un certain*** | ***Imp*** |
| 1 | No. of Full time Faculty to Stipulated Norms | 2% | 6% | 92% |
| 2 | No. of Part Time faculty | 26% | 32% | 42% |
| 3 | % of Faculty with Doctorates and other advanced functional skill | 2% | 5% | 93% |
| 4 | Industry-Academic Ratio of faculty | 4% | 10% | 86% |
| 5 | No. of exceptions to admission policy and standards | 18% | 32% | 50% |
| | ***Initiatives taken to align tacit interactions to institutional objectives*** | | | |
| 6 | A clearly formulated and communicated mission statement | 0% | 7% | 93% |
| 7 | Faculty Competence Development Plans | 1% | 4% | 95% |
| 8 | Inventory of need for training and education of faculty and staff | 0% | 4% | 96% |
| | ***Financial investment in structures to improve tacit-tacit interactions*** | | | |
| 9 | Training expense per faculty-(MDP's, FDP's etc) | 9% | 20% | 71% |
| 10 | Amount spent on institutional sponsorship to various Associations/ Societies | 12% | 30% | 58% |
| 11 | Statement of Costs and Benefits | 20% | 33% | 47% |
| 12 | Cost of unit of education | 21% | 23% | 56% |
| 13 | Total student expense/Total fees | 24% | 28% | 48% |
| | ***Involvement of major participants in the decision making process*** | | | |
| 14 | Mandatory student representation on key committees (placement, curriculum, recruitment etc.) | 7% | 12% | 81% |
| 15 | Mandatory Faculty representation on imp.Boards/Committees etc | 8% | 17% | 75% |
| | ***Depth in quality of tacit interactions through networking*** | | | |
| 16 | No. of student exchange programmes aligned to mission | 8% | 20% | 72% |
| 17 | No. of faculty exchange programmes aligned to mission | 9% | 20% | 71% |
| 18 | No. of linkages with national/international Academic research bodies | 9% | 13% | 78% |
| | ***Existence of mechanisms to encourage tacit interactions*** | | | |
| 19 | No.of initiatives made for enhancing informal communication eg. mentoring, brainstorming, lunch breaks etc. | 2% | 1% | 97% |
| 20 | No. of FDP's /Seminars/Conferences/workshops etc.organized | 3% | 4% | 93% |
| 21 | No. of communities of special interest/practices (CoP's) | 19% | 42% | 39% |
| 22 | Ratio of number of users to no. of members in the CoP's | 13% | 36% | 51% |
| 23 | No. of student activities organized | 6% | 17% | 77% |
| 24 | No. of students organizing activities/total students | 5% | 4% | 91% |
| 25 | Opportunities created for students to develop leadership qualities | 1% | 4% | 95% |
| 26 | No. of guest lectures/ industry expert interactions | 2% | 11% | 87% |

| | ***Infrastructural structure to encourage tacit interactions*** | ***Un Imp*** | ***Un certain*** | ***Imp*** |
|---|---|---|---|---|
| 27 | Internet access to all during working hours | 14% | 26% | 60% |
| 28 | No. of classrooms with the latest audio-video teaching aids | 6% | 12% | 82% |
| 29 | No. of computers per student | 10% | 10% | 80% |
| 30 | No. of computers per faculty | 5% | 13% | 82% |
| **Externalization** | | | | |
| | ***Outcomes of the process of converting tacit to explicit*** | | | |
| 31 | No. of papers/articles/book reviews/published per faculty in refereed journals in keeping with strategic objectives of the institution | 8% | 9% | 83% |
| 32 | No. of books published per faculty in keeping with strategic objectives of the institution | 15% | 17% | 68% |
| 33 | Per faculty contribution to subject page on intranet/internet | 2% | 5% | 93% |
| 34 | No. of faculty interactive activities with industry | 6% | 11% | 83% |
| 35 | Activities/ Output per community to total members in each CoP | 8% | 15% | 77% |
| 36 | No. of Faculty Awards/ Recognition | 9% | 10% | 81% |
| **Combination** | | | | |
| | ***Information requirements of the institution*** | | | |
| 37 | Data Information requirement committee of stakeholders | 11% | 24% | 65% |
| | ***Is the relevant explicit knowledge available*** | | | |
| 38 | No. of books borrowed per student | 8% | 23% | 69% |
| 39 | No. of books borrowed per subject | 11% | 23% | 66% |
| 40 | Presence of Library page on Intranet/ Internet with links to educational Resources (e-books/e-journals/faculty subject pages etc.) | 6% | 12% | 82% |
| 41 | Presence of faculty subject web pages on intranet/internet | 2% | 8% | 90% |
| 42 | No of logins to Library page hosted on intranet/internet | 6% | 22% | 72% |
| 43 | No. of logins to online databases | 11% | 20% | 69% |
| 44 | No. of intranet user-id created | 12% | 31% | 57% |
| 45 | No. of intranet logins per faculty | 16% | 24% | 60% |
| 46 | No. of intranet logins per student | 13% | 23% | 64% |
| | ***Financial expense incurred to make it available*** | | | |
| 47 | Amount of library expense/ per student | 13% | 23% | 64% |
| 48 | Journals + Magazine +Periodicals purchased per student | 8% | 3% | 89% |
| 49 | Investment in technology ie. intranet/internet/groupware and other such other latest software and people to maintain it | 4% | 12% | 84% |
| | ***Extenalization of external and internal environment*** | | | |
| 50 | Directory of Best Practices | 7% | 26% | 67% |
| 51 | Regulatory bodies guidelines, accrediting organizations requirements, archived reports etc. Database | 8% | 23% | 69% |
| 52 | Maintaining Recruiters database | 6% | 6% | 88% |
| 53 | Competitor Information Database | 12% | 12% | 76% |
| 54 | Maintaining Alumni database | 7% | 17% | 76% |
| 55 | Maintaining Faculty Expertise Directory | 3% | 19% | 78% |
| 56 | Maintaining Faculty Profile database | 3% | 8% | 89% |
| 57 | Maintaining Student database-admission to placements to career progression | 1% | 2% | 97% |

| | ***Externalization of information about the institution*** | ***Un Imp*** | ***Un certain*** | ***Imp*** |
|---|---|---|---|---|
| 58 | Institutional web presence | 4% | 11% | 85% |
| **Internalization** | | | | |
| | ***Presence of structures and mechanism to facilitate internalization*** | | | |
| 59 | Regular faculty feedback is provided by students | 1% | 4% | 95% |
| 60 | Regular staff appraisals are conducted with faculty inputs | 2% | 11% | 87% |
| 61 | No. of pedagogical innovations made per faculty | 12% | 12% | 76% |
| 62 | Provision for regular student performance evaluation by faculty | 12% | 31% | 57% |
| 63 | Program quality assessment by recruiters | 1% | 15% | 84% |
| 64 | Hours spent by management on reviewing strategy and action | 2% | 5% | 93% |
| 65 | No. of hours spent by management with HoD's in discussing competitor strengths and weakness | 8% | 15% | 77% |
| | ***Measures of outcomes of internalization efforts*** | | | |
| 66 | No. of student awards / distinctions/ recognitions | 8% | 3% | 89% |
| 67 | No. of Initiatives to support alumni activities | 8% | 3% | 89% |
| 68 | Ratio of issues resolved to issues placed in Student Grievance Cell | 9% | 21% | 70% |
| 69 | No. of action-items reviewed after meetings between mgmt and faculty | 2% | 1% | 97% |
| 70 | No. of internal awards and incentives for knowledge sharing activities | 1% | 11% | 88% |
| 71 | No. of processes reviewed | 4% | 20% | 76% |
| 72 | No. of processes changed | 9% | 24% | 67% |
| 73 | No. of improvements in Library service | 1% | 15% | 84% |
| 74 | Any recent innovation in student/faculty assessment | 4% | 15% | 81% |
| 75 | No. of new ideas/initiatives acquired from students | 1% | 11% | 88% |
| 76 | No. of new ideas/initiatives acquired from faculty | 0% | 8% | 92% |
| 77 | No. of new ideas/initiatives acquired from alumni | 5% | 24% | 71% |
| 78 | No. of suggestions for improvements in institutional database incorporated to no. of suggestions made | 15% | 21% | 64% |
| 79 | No. of times faculty/students/staff questioned existing policies and working methods, to innovate and change current system | 9% | 21% | 70% |
| 80 | No. of Industry Best Practices adopted | 12% | 12% | 76% |
| 81 | Avg no. of years a recruiter has been with you | 12% | 20% | 68% |
| 82 | Ratio of recruiter suggestions accepted to suggestions made | 11% | 24% | 65% |
| 83 | No. of proactive measures taken | 5% | 24% | 71% |
| **Organizational Benefits** | | | | |
| | ***Student related benefits*** | | | |
| 84 | Increase in no. of students getting stipend for summer internship | 6% | 20% | 74% |
| 85 | Increase in no. of students getting job offers from companies they did summer internship in | 1% | 8% | 91% |
| 86 | Increase in Percentage of students getting campus Placements | 0% | 1% | 99% |
| 87 | Increase in no. of student academic recognitions tototal students | 6% | 12% | 82% |
| 88 | Increase in min, max, avg. salaries of students placed | 16% | 15% | 69% |

| | ***Faculty related benefits*** | ***Un Imp*** | ***Un certain*** | ***Imp*** |
|---|---|---|---|---|
| 89 | Increase in average age of service of faculty | 13% | 20% | 67% |
| 90 | Increase in no. of faculty recognitions | 4% | 18% | 78% |
| | ***Finanacial benefits*** | | | |
| 91 | Enhancement of profits i.e. increase in corpus | 16% | 20% | 64% |
| 92 | Savings from implemented faculty/student suggestions | 11% | 24% | 65% |
| | ***Intangible Institutional benefits*** | | | |
| 93 | Increase in proportion of applications rejected tototal applications | 18% | 32% | 50% |
| 94 | Increase in no. of industry leaders recruiting collaborations | 4% | 10% | 86% |
| 95 | Increase in quality of networking alliances and | 5% | 12% | 83% |
| 96 | Enables the Institute to analyze and evaluate information better | 5% | 19% | 76% |
| 97 | Increase in number of MD's/CEO's/COO's in the alumni list | 7% | 18% | 75% |

## Appendix 2

**Reliability Analysis**

***Reliability***

| Cronbach' Alpha | No. of Items |
|---|---|
| 959 | 95 |

## Appendix 3

**The Knowledge Management Metric**

**Socialization**

1 No. of Full time Faculty to Stipulated Norms
2 % of Faculty with Doctorates and other advanced functional skill
3 Industry-Academic Ratio of faculty
4 No. of exceptions to admission policy and standards
5 A clearly formulated and communicated mission statement
6 Faculty Competence Development Plans
7 Inventory of need for training and education of faculty and staff
8 Training expense per faculty-(MDP's, FDP's etc)
9 Amount spent on institutional sponsorship to various Associations/Societies
10 Statement of Costs and Benefits
11 Cost of unit of education
12 Total student expense/Total fees
13 Mandatory student representation on key committees (placement, curriculum, recruitment etc.)
14 Mandatory Faculty representation on imp.Boards/Committees etc
15 No. of student exchange programmes aligned to mission
16 No. of faculty exchange programmes aligned to mission
17 No. of linkages with national/international Academic research bodies
18 No.of initiatives made for enhancing informal communication eg. mentoring, brainstorming, lunch breaks etc.

19 No. of FDP's /Seminars/Conferences/workshops etc.organized
20 Ratio of number of users to no. of members in the CoP's
21 No. of student activities organized
22 No. of students organizing activities/total students
23 Opportunities created for students to develop leadership qualities
24 No. of guest lectures/ industry expert interactions
25 Internet access to all during working hours
26 No. of classrooms with the latest audio-video teaching aids
27 No. of computers per student
28 No. of computers per faculty

**Externalization**

29 No. of papers/ articles/book reviews/published per faculty in refereed journals in keeping with strategic objectives of the institution
30 No. of books published per faculty in keeping with strategic objectives of the institution
31 Per faculty contribution to subject page on intranet/internet
32 No. of faculty interactive activities with industry
33 Activities/Output per community to total members in each CoP
34 No. of Faculty Awards/Recognition

**Combination**

35 Data Information requirement committee of stakeholders
36 No. of books borrowed per student
39 No. of books borrowed per subject
40 Presence of Library page on Intranet/ Internet with links to educational Resources (e-books/e-journals/faculty subject pages etc.)
41 Presence of faculty subject web pages on intranet/internet
42 No of logins to Library page hosted on intranet/internet
43 No. of logins to online databases
44 No. of intranet user-id created
45 No. of intranet logins per faculty
46 No. of intranet logins per student
47 Amount of library expense/per student
48 Journals + Magazine +Periodicals purchased per student
49 Investment in technology ie. intranet/internet/groupware and other such other latest software and people to maintain it
50 Directory of Best Practices
51 Regulatory bodies guidelines, accrediting organizations requirements, archived reports etc. Database
52 Maintaining Recruiters database
53 Competitor Information Database
54 Maintaining Alumni database
55 Maintaining Faculty Expertise Directory
56 Maintaining Faculty Profile database
57 Maintaining Student database-admission to placements to career progression
58 Institutional web presence

**Internalization**

59 Regular faculty feedback is provided by students
60 Regular staff appraisals are conducted with faculty inputs
61 No. of pedagogical innovations made per faculty
62 Provision for regular student performance evaluation by faculty
63 Program quality assessment by recruiters
64 Hours spent by management on reviewing strategy and action
65 No. of hours spent by management with HoD's in discussing competitor strengths and weakness
66 No. of student awards / distinctions/ recognitions
67 No. of Initiatives to support alumni activities
68 Ratio of issues resolved to issues placed in Student Grievance Cell
69 No. of action-items reviewed after meetings between mgmt and faculty
70 No. of internal awards and incentives for knowledge sharing activities
71 No. of processes reviewed
72 No. of processes changed
73 No. of improvements in Library service
74 Any recent innovation in student/faculty assessment
75 No. of new ideas/initiatives acquired from students
76 No. of new ideas/initiatives acquired from faculty
77 No. of new ideas/initiatives acquired from alumni
78 No. of suggestions for improvements in institutional database incorporated to no. of suggestions made
79 No. of times faculty /students/ staff questioned existing policies and working methods, to innovate and change current system
80 No. of Industry Best Practices adopted
81 Avg no. of years a recruiter has been with you
82 Ratio of recruiter suggestions accepted to suggestions made
83 No. of proactive measures taken

**Organizational Benefits**

84 Increase in no. of students getting stipend for summer internship
85 Increase in no. of students getting job offers from companies they did summer internship in
86 Increase in Percentage of students getting campus Placements
87 Increase in no. of student academic recognitions tototal students
88 Increase in min, max, avg. salaries of students placed
89 Increase in average age of service of faculty
90 Increase in no. of faculty recognitions
91 Enhancement of profits i.e. increase in corpus
92 Savings from implemented faculty/student suggestions
93 Increase in proportion of applications rejected tototal applications
94 Increase in no. of industry leaders recruiting collaborations
95 Increase in quality of networking alliances and
96 Enables the Institute to analyze and evaluate information better
97 Increase in number of MD's/CEO's/COO's in the alumni list