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Development of an Integrated Knowledge and Technology Management Model for the Higher Education

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***Abstract*—The present higher educational institutions are vying for excellence and strive to meet the expectations of individuals, organizations and the social institutions in their external environments. Knowledge Management (KM) and Total Quality Management are the most common of the tools which these institutions have adopted based on the success stories in the industrial organizations. Considering these dual paradigms in higher education, this paper focuses on the integrated approach that makes an attempt to combine KM into TQM processes/practices. The paper is oriented towards the perspectives on organizational excellence that can be achieved by incorporating KM concepts into the TQM processes, which forms a cycle of continuous improvement and development. The article identifies the key parameters with suppliers and customers as the external environment acting on input and output of the system linked to organizational excellence. The perspectives on the integrated approach in higher education are also discussed addressing the demand and supply side of higher education.**

Keywords—Knowledge Management; Total Quality Management; Organizational Excellence; Higher Education; Continuous Improvement; Integrative Model.

I. INTRODUCTION

Higher education has undergone phenomenal changes at the local, national, and global levels particularly after the information revolution. There is an exponential growth in the number of higher education institutions in the past two decades, especially in the private sector. Present higher educational institutions are essentially creatures of industrial revolution struggling to survive in an era of the information explosion and disruption. Higher educational institutions exist to meet the expectations of individuals, organizations and the civil society organizations in the external environment.

Interestingly, KM has become an essential topic in both research and practice. The adoption of KM has accelerated since the past decade in an unprecedented manner [1]. KM exists to transform intellectual assets into enduring value. Linking the knowledge resources to the people who need it the most is one of the primary functions of KM. Researchers are now trying to apply the KM principles into higher education to identify, capture, retrieve, share and evaluate its knowledge assets to help achieve a sustainable competitive advantage by proper use of people, processes and technology.

The term quality has many different definitions among which the most common is, 'satisfying the needs of the customers. TQM or Continuous Quality Improvement (CQI) was initially developed in the context of industrial processes for holistic quality improvement. In the recent past, some efforts have been made in applying TQM in the educational sector with a very promising outcome. TQM exists fundamentally to refine the organizational processes so that the deviations from the standard are limited to the minimum possible [2]. As TQM generally focuses on customer satisfaction, continuous improvement and employee empowerment and create socio-educational consciousness among stakeholders.

With KM and TQM both acting concurrently, an integrated approach of salient processes in higher education is quintessential. This paper attempts to use the integrated model of KM and TQM to higher education, which has been successfully applied in the business world. Thus, the proposed model is an attempt to link these two concepts to contribute towards organizational excellence.

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II. Role of KM in Education

KM concept has been internalized by the organizations from their vision to the objectives, strategies, policies and practices to facilitate the journey towards transformation into a learning organization [3]. According to the Oxford dictionary, knowledge is defined as, an understanding gained through experience, observation or study. Southon & Todd define KM as, "a fluid mix of experience, values, contextual information and expert insight that provide a framework for evaluation and incorporating new experiences and information" [4].

KM has already been embraced as a source of the solution to the problems of today's businesses. If KM is adopted effectively in educational institutions, it can lead to better decision-making capabilities, reduced product development time, e.g., curriculum development, research, and improved academic and administrative services and thereby reducing the costs [5]. Knowledge both tacit and explicit is available in the form of textbooks, lecture notes, research journals, magazines, laboratory manuals, technical reports and now many online learning resources. In addition to this knowledge, there is a need to harness institutional knowledge, which the faculty acquires over a period of time, as they gather experience through various sources. This aspect could be used to develop the capability of taking decisions, interdisciplinary learning, develop the spirit of teamwork and transparency, appropriate vision, industry interface, entrepreneurship support, and commitment for the society.

III. Role of TQM in Education

TQM in the concept of business organizations aims to minimize or eliminate waste and enhance the quality of the service or product [6]. Attempts are already on to reap the benefits of TQM in higher education; however, the barrier has been in the identification of the processes to which TQM has to be applied. The reason for this is the existence of intangible parameters in an education system. TQM in education was proposed in the early 90s. Books like - TQM for Professors and Students and TQM in Higher Education declared that TQM could be seen as the paradigm for improving every aspect of collegiate functioning from fiscal administration to classroom instructions [7] [8]. Ever since TQM implementation in the educational sector has been a continuous endeavor.

TQM is already a part of management philosophy in educational institutions in US, UK, Australia, and New Zeeland [9]. Kanji, Tambi and Wallace in their survey [9], have found that TQM is applicable irrespective of the turnover, size and governance of the institution. It was revealed that the organizations implemented TQM have outperformed non-TQM institutions regarding organizational performance [10].

TQM helps in achieving a higher level of quality in higher education and producing global learners of the highest order and innovators capable of applying cutting-edge solutions to societal problems and environmental conservation issues. The American Supplier Institute (ASI) illustrates that TQM is about:

- An increased focus to customer satisfaction.
- The dedication to providing the customer with quality goods or services.
- A program of continuous quality improvement
- An understanding that any organization's greatest assets are its people.

These principles, which are specifically in the context of manufacturing industries [11] [12]. According to the authors both KM and TQM are Input-Output processes, there is a drastic transformation taking place, and the outputs of the transformation meet customer needs and expectations. While KM considers knowledge as a source of educational development and competitive edge, TQM relies on quality improvement to achieve stakeholder satisfaction.

IV. Integration of KM and TQM

KM and TQM are two concepts, which have had an ever-lasting effect on the organizations and businesses that have adopted it. TQM being a quality-oriented philosophy has had an ever-increasing stream of concepts and theories, which have been highly successful in industries and now in higher education. Various researchers have made an attempt to integrate the two concepts, and it has resulted in the development of several theoretical models [13] [14] [15] [16].

This conceptual and theoretical framework of KM and TQM integration is developed by considering their similarities and differences Figure 1. The very success of the proposed model lies in the three types of learning which should be inculcated in the very fabric of educational institutes, namely: reflective learning, innovative learning, and adaptive learning. The pro- posed model essentially has three parametric components, viz., input and output parameters aligned to contribute towards the organizational excellence in the form of a continuous cyclic process. The input parameters in the educational institutes may include data/information/knowledge in books, publications, patents, teaching-learning processes, assignments, and projects. The output parameters may include aspects which meet industrial requirements, societal needs, new product development, services, research & developments, and intellectual capital.

The organizational parameters include the KM and TQM processes. Input parameters should be coupled with innovative learning leading to the refinement of TQM and KM processes thus enhancing the organizational excellence. Similarly, the outcome parameters when united with reflective learning

should lead towards the refinement in the inputs in the form of existing data, information and knowledge. When the output is linked with adaptive learning, it leads to further enhancement in the efficiency of the organizational processes.

Exploiting KM for its latest knowledge capturing ability to induce small and continuous improvements in TQM would be a positive contribution to system quality enhancement. In the present environment characterized by rapid change and stiff competition, organizations are facing critical issues of adaptation, survival, and sustenance of their businesses. These critical issues can be addressed and obtain a competitive edge can be obtained by not only acquiring, embedding and using the latest available knowledge but also co-creating innovative knowledge. Organizational excellence can be achieved through synergistic combination of KM and TQM processes. Knowledge of customer and understanding the customer requirements are the prerequisites of customer satisfaction. Hence, to be successful, it is necessary to take an integrated approach, wherein TQM should address higher education reforms and deal with them through improving KM capabilities and operational skills.

The salient features of proposed model involve self-reflective and adaptive cycles involving the following aspects:

- Current knowledge and the inputs.
- Feed into a holistic, total academic, research and administrative processes.
- Produces the required output contributing to the development.
- Stimulate the individual and collective reflection.
- Learning and adoption of changes into the inputs and outcomes

To successfully implement this approach, requirements are very similar to those required to implement KM and TQM individually and it includes:

1. Continuous support and commitment from top leader- ship.
2. Allocation of adequate human, financial, and physical resources.
3. Knowledge of the stakeholders' needs and expectations.
4. Harnessing of existing knowledge and co-creating of new knowledge.
5. Transparent and healthy work culture for continuous improvement.
6. Encouragement of individual/collective learning and interdisciplinary learning.
7. Establishment of performance measures to support a collaborative research culture.
8. Framing of a long-term and unambiguous policy frame-work and its implementation.
9. Optimum use of resources and technology.
10. Providing of additional benefits to attract the experts in diverse fields.

V. Relevance of KM and TQM Integration Model

Elevance of KM and TQM Integration Model

Educational institutions and universities are knowledge in-tensive service organization and are increasingly are exposed to marketplace pressures [17], [18]. The universities are expected to adapt to a newer model of teaching-learning processes with the arrival of the knowledge-based economy. Higher education is a knowledge-intensive activity; hence, the application of KM to educational institutions assumes greater significance and this is particularly true for technical institutions, as these institutions perform many of the knowledge- centric activities like content creation, teaching-learning interactions, research activities, experimentation, consultancy services, process/product development, technology transfers, community and skill development activities, industrial/field visits and inspections, and inculcation of values.

Globalization is typically characterized by people migration, financial flows, lending landscape, commodity trade, consumer business, cultural exchanges, and the diffusion of ideas, concepts, and principles will have a major impact on the higher education policy-making. With the globalization of higher education, there is an increased emphasis on the enhancement of quality of higher education. This is because of increased pressure to deal with people persuasion, accountability, change management, proper assessment, and institutional effectiveness. Further, achieving quality in higher education is a multidimensional concept. Hence, there is a need to use a concept, which is comprehensive and encompasses every aspect of quality regarding its application, achievement, and implementation on a continuous basis with an emphasis on customer satisfaction. TQM is one such concept which is being increasingly used to improve various facets of higher education such as teaching-learning process, research and community development. The integrated model is significant to educational organizations because the knowledge, discovery, development, management and its application in real-world situations are essential for maintaining a competitive edge over others and to take the higher education to the next higher level of quality.

VI. Benefits of the Integrative Model

Following direct benefits may be derived by the higher educational institutes through the proposed model:

- As KM supports decision-making and TQM promotes change management the combination of these two will result in the creation of innovative culture across the system.

- As both are customer-centric activities the customer relationship management will improve resulting customer satisfaction and delight.
- Organizational knowledge will be made available to all the sections across the educational system.
- Communities of practices can promote breakthrough innovations.
- Both the asynchronous and synchronous communications introduced through the system will encourage divergent thinking by bringing people with multiple perspective together.
- Document and content management will be made more systematic and standardized.
- Entire educational system will be ultimately geared towards adapting itself into a learning organization.

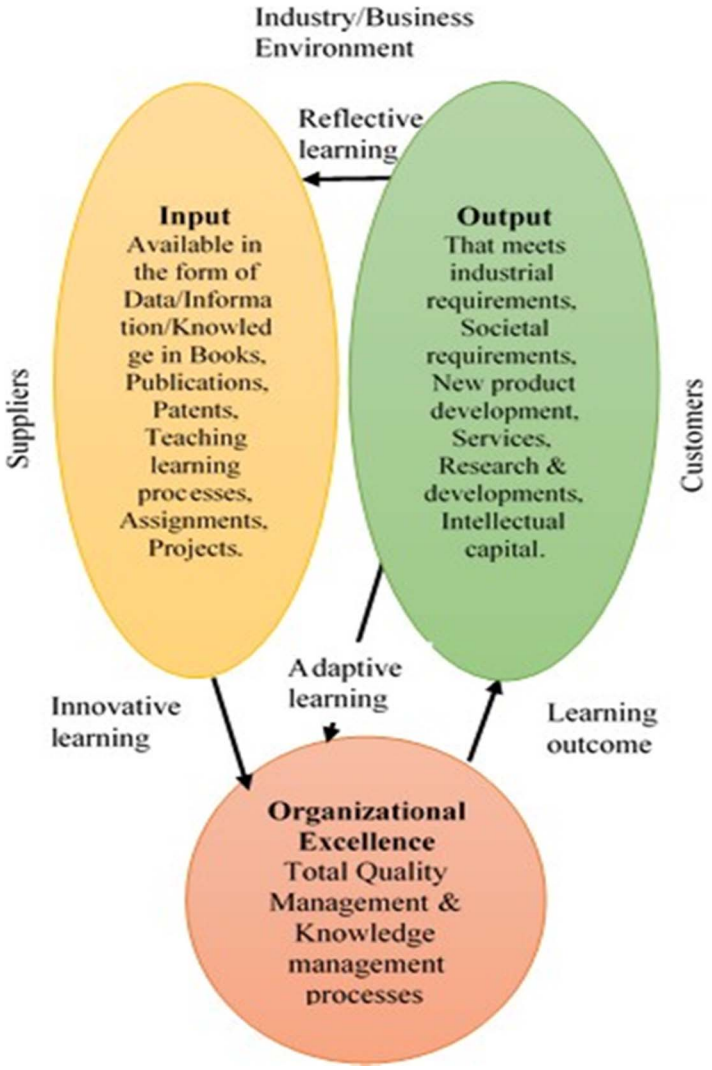

Fig. 1. An Integrated Approach to Management

Higher educational institutions of today must prepare them- selves to keep abreast of ever-changing technologies and be able to sustain competitive advantage in business. KM and TQM are complementary to each other in supporting this aim in the form of a cycle of development and improvement, leading to organizational excellence.

VII. Conclusion

The present higher education system has embraced many different modes of disseminating knowledge through distance education, online education, virtual universities, massive online open courses, flipped classrooms etc. The shared experience of co-education and collaborative growth consisting of traditional and modern cultures has forged unity among the global citizens. In this context, there is a need for improving the quality of education, providing flexibility, nurturing the spirit of innovation, endorsing multi-culturalism, promoting laboratory work, and encouraging entrepreneurship. The integrative model proposed in this paper has the potential to meet these requirements with the right combination of people,

processes and technology. While industries have adopted KM and TQM as survival tools, the higher educational institutions are yet to reap the rich benefits of imbibing these time-tested techniques. The proposed model has the potential to pave the way to success in this direction.

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