Master of Technology Concurrent Degree Partnership with Kent State University, USA and the Center for International Management (CIM) in New Delhi, India

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Abstract : *In this paper, an innovative and comprehensive curriculum model to implement a concurrent degree program leading to a Master of Technology (MT) is presented. This joint and/or concurrent degree program is recognized as a unique model of academic partnership between Kent State University's School of Technology in Ohio, USA and the Center for International Management (CIM) in New Delhi, India. This collaborative agreement has been designed to promote international outreach, global economic development and to meet the challenges of accelerating technological changes impacting the future workforce serving the changing international economy.*

A Memorandum Of Understanding (MOU) has been reached between the two institutions on direct academic cooperation which is envisioned in four(4) broad areas:

1. *Concurrent Graduate Degree Program*
2. *Faculty and Student Exchange Program*
3. *Short-term Collaborations, and*
4. *Joint Economic Development Programs*

This paper will provide a brief overview on each of the collaborative areas with rationale towards a strategy for improved international partnership in the new millennium economy.

Index Terms --- *Curriculum, Information Technology, Business Technology, Application Engineering, Technology Transfer, Technology Assessment and Forecasting, Economic Development, International Outreach and Partnership, Global Economy.*

Introduction:
Rationale for the Institutional Collaboration and International Outreach

With knowledge increasing at an unprecedented rate, continuously coping with the technological changes impacting the speed of information, communication and the societal advancement… our learning community (i.e: schools, colleges, universities and institutes) needs to be ***engaged!***
The ***Engaged University Model*** is a new higher education paradigm at Kent State University redesigning its mission of teaching, research, outreach and service functions to serve the new economy and to get productively involved in the economic development efforts both regionally and globally [1] Not only the technological pace but the impact of cultural change – *the internationalization of American life* – has demanded the creation of a new learning society[2]. The Center for International Management (CIM), a post graduate institute located in New Delhi, India, has also recognized that the success of a global enterprise in today's economy will largely depend upon techno-economic considerations, not geography. The emerging international trade and commerce will be shaped through entrepreneurial techno-managers who are multi-skilled, technologically literate and understand the dynamics of the global market place. CIM, therefore has identified an educational endeavor to develop a post-graduate program in Information and Business Technology by leveraging unique talents, abilities and skills transcending international boundaries [3]. Parallel to this rationale, Kent State University's Master of Technology (MT) degree program has also

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accepted the fact that the inevitable and highly visible economic, technological and geo-political forces are not only reshaping the world but also reshaping the infrastructure of the American socio-economic and educational system [4].

Master of Technology Degree Overview :

In an effort to provide easier access to high quality, technology-based education, Kent State University's School of Technology has developed curriculums in a variety of contemporary technology fields. The School's Master of Technology (MT) degree allows students to develop a comprehensive approach to the technology discipline with specializations in the following areas [5] :

- Computer and Information Technology
- Quality and Reliability Systems
- Technology Management
- Automation / Digital Control Systems
- Computer Integrated Manufacturing
- Aeronautics and Aviation Technology
- Technology Education

The Master of Technology can be viewed as an interdisciplinary degree (Figure 1) providing the needed competencies to serve *engineering, business* and *technology* disciplines and/or sectors.
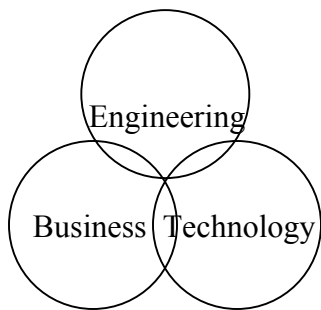
FIGURE 1
A Curriculum Synergy in the Master of Technology Degree at Kent State University

Master of Technology Degree Requirements:

The School of Technology at Kent State University provides a practitioner based curriculum model with a seamless transition from Certificate to Associate to Bachelor of Science to Master of Technology degrees. This is designed to promote continuous improvement, skill development and life-long learning for the technology-based workforce.
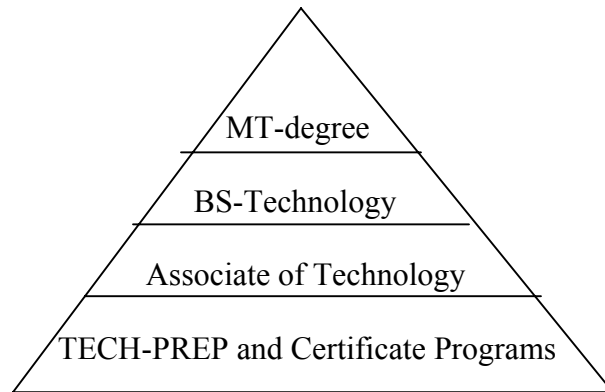
FIGURE 2
Technology Curriculum Model at Kent State University
Emphasizing High-Technology Applications

Students pursuing a Master of Technology (MT) degree must complete a minimum of 32 graduate credit hours. At least 16 of those hours must be School of Technology (TECH) courses at the 60000 (post undergraduate) level and above. The students must also satisfy three (3) core course requirements which are :

- TECH 50000 : Quality Standards
- TECH 60000 : Project Management
- TECH 60078 : Research in Technology

The attractive feature in the MT-degree is the "program flexibility" which allows the students to complete the majority of graduate level courses via the World Wide Web, Internet assisted education, and I-Link/V-Tel : video-teleconferencing. Given the rapidly changing tools, such as, computer assisted instruction,

virtual reality and multi-media applications, the pedagogy and learner-centered environment has dramatically changed. Also due to the expected working skills and knowledge of the technical workforce including the diverse needs of job requirements and career trends, this program flexibility has been and continues to be important to meet the required human resource development and life-long learning needs for the 21st. Century economy.

The core courses are designed to provide required competencies in applied research, cognitive and quantitative skills focusing on the technology environment. The degree program offers both a thesis and a non-thesis option. The thesis option is recommended for students interested in pure research , development and advanced post graduate studies in a specific technical areas of interest. The non-thesis approach is suggested for students who seek a more general curriculum for advanced practical course work for career development. Therefore, the MT-degree template has the following *"minimum"* credit hour requirements [5] :

-   Core courses   = 9 Semester Hours
-   Specialization Area = 15 Hours
-   Elective Courses   = 2-3 Hours
-   Thesis/Non-Thesis = 6 Hours

Role of synchronous and asynchronous modes of course delivery towards the MT-degree program :

Distance Learning (DL)) and the distributive model of instructional delivery should be viewed as a "life-long learning" and re-engineering tool without regard to geographic location and time of course delivery. Therefore, DL-based education in the School of Technology is the strategic methodology to broaden and enrich the possibility to provide global access to the MT-degree program and

enrich the possibility of education through distance learning (DL) as the core institutional activity supplementing the standard *"teaching-research-service agenda "* at Kent State University, USA.
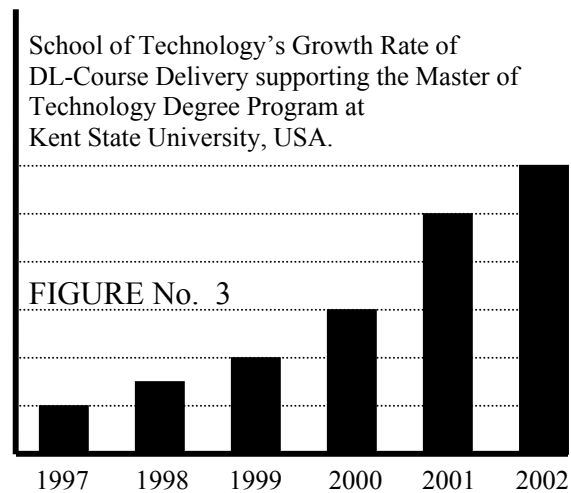

Growth (%)

School of Technology's Growth Rate of DL-Course Delivery supporting the Master of Technology Degree Program at Kent State University, USA.

FIGURE No. 3

1997   1998   1999   2000   2001   2002

Providing the DL-access to the MT Degree program has provided the following advantages to serve the global education and high technology training. Specifically the degree has been designed to [5] :

-   Provide industry-wide expertise in education and training.
-   Provide "virtual experts" via a variety of asynchronous and synchronous delivery models of instruction.
-   Assist with non-traditional students to complete graduate education and training towards their career in the wired-21st. Century.
-   Provide life-long learning in the high-technology environment and emerging skills needed in contemporary careers and jobs.
-   Provide online and "real-time" access anytime and anywhere in the world.

Center for International Management (CIM) in New Delhi, India :

Recognizing the Indian sub-continent as the major intellectual "hub" of the information technology and the Asian intellectual economy, CIM has taken the initiative to partner with Kent State University's MT-program to bring a "new academic model of academic collaboration" to prepare the new generation of techno-workforce to serve the global economy.

Particulars of the MOA between CIM-India and Kent State University (KSU) , USA. :

The Memorandum of Agreement signed on May 10, 2001 by the two institutions is based upon the premises of academic partnership, student and faculty exchange , and global economic development programs. The MOA is elaborated as follows [6] :

1.Concurrent Degree Programs :
Cooperation in this area will take place at the Master's degree level in the area of *Information and Computer Technology* and will lead to the simultaneous award of post-graduate diploma in Business Technology from CIM-India and Master of Technology (MT) degree from KSU. Students participating in the program must complete no fewer than 32-semester credit hours and no fewer than 21 hours (60%) must be completed at Kent State University. The degree articulation has been approved by the graduate faculty and the curriculum committees in each institution.

2. Faculty and Student Exchange :
Although the cooperation is initially envisaged in the area of Information Technology (IT), both partners may, by mutual agreement, cooperate in all scholarly areas listed in the respective bulletins of each institution. Within those parameters, both institutions have agreed on the following forms of cooperation :

(a). Joint Research Projects.

(b). Mutual Invitations, up to one year of duration, for faculty members to teach, present lectures, seminars and share experiences with colleagues at the particular institution.

(c). Mutual invitations for faculty members to participate in congresses, scientific sessions, symposia and international seminars involving socio-economic developments.

(d) Exchange of information in field of interest to both partners, and

(e). Exchange of junior teaching staff members or graduate students for periods of research or training in designated fields of cooperation.

3. Short-term Collaborations :
The Memorandum of Understanding (MOA) between KSU-USA and CIM-India incorporates by reference the existing agreement signed in 1999, concerning the exchange of student interns and faculty in the field of Fashion Design and Merchandising/ Apparel and Technology. This extended MOA further allows for the short-term exchange of faculty and students and curriculum to serve the best interest of students in Fashion Design and an articulated program in the Master of Technology degree in the School of Technology.

4. Joint Economic-Development Programs :
To the end of enhancing global competitiveness and of accelerating the knowledge-based economy, the two partners (KSU and CIM) agree to cooperate in the organization of joint forums, seminars and workshops in the broad areas of " Economic Development". These symposia will aim to bring together selected individuals representing the industrial, commercial, government, international agencies and academic sectors, *inter alia,* to the end of identifying improved economic well being.

Conclusion : Summary of the partnership

Students admitted into the CIM/KSU concurrent degree program will also complete the Post-Graduate Diploma in Business Technology (PGDBT) offered at the Center for International Management, India. The PGDBT integrates the Information Technology (IT) concepts, skills and applications on a prescribed curricula approved and accepted by Kent State University's MT-degree program. Spread over 18 months, the diploma includes four(4) academic terms, two(2) project terms, 35 courses carrying a total of 36 credits with 1 credit being equivalent to 24 sessions of 70 minutes each. The first year of this program feeds into the Kent State University's MT-degree with a concentration in Computer and Information Technology [7] .

Core Course at CIM
Academic Foundation in Computer
And Business Technology

PGTBT Requirements	Credits
IT 101 : IT for Business	1
IT 201 : Data Structure, Algorithms	1
IT 202 : Data Communication	1
IT 203 : Cyber Marketing	1
IT 301 : Data Base Management	2
IT 302 : Software Engineering	2
IT 401 : IT Business Applications	2
IT 402 : Applications Engineering	4
IT 403 : Network Computing	4
IT 901 : Field Study (Project)	2
IT 902 : Final Comprehensive Project	7

The concurrent degree program between CIM and Kent State University follows after the successful completion of the Post Graduate Diploma with a minimum grade point average of "B" (3.0 on a 4.0 scale), minimum 1200 score in Graduate Record Examination (GRE) and a minimum score of 200 and above in the TOEFL*(test of english as a foreign language)*.

While the first year of the concurrent degree program will be delivered at CIM-India, the students will have to complete the second year at Kent State University. Credit earned at CIM get transferred to the KSU's M.Tech program enabling the students to complete the degree in two full semesters (Fall and Spring) and the Summer term . The Master of Technology Degree is awarded by Kent State University and the Post Graduate Diploma in Business Technology is awarded by CIM-India.

Required Courses to Complete MT-Degree At Kent State University for CIM-India Students (Min. 21 hours)

MT-Degree Requirements	Credits
TECH 50000: Quality Standards	3
TECH 60000: Project Management	3
TECH 60078: Research in Technology	3
TECH 61095: ST- Computer Hardware	3
TECH 51093: WS- Windows 2000/NT	3
TECH 51093: WS- Cisco Internetworking	3
TECH 51095: ST- Database Management	3
TECH 64010: Interconnectivity/ Operation	3
TECH 51093: ST- Adv. Web Development	3
TECH 65700: Applied Reliability Engg.	3
TECH 65500: Quality and Productivity	3

References
[1] Kellogg Commission Report: The Engaged Institution, National Association of State Universities and Land Grant Colleges, Washington D.C, 1999 and 2000.

[2] Marx Gary. Education for Tomorrows World, The Futurist, Volume 35, No. 2, Maryland, USA, 2001.

[3] Center For International Management: Website (www.cimindia.org).

[4] Kent State University Strategic Plan (www.kent.edu)

[5] School of Technology Website (www.tech.kent.edu)

[6] Kent State University memorandum of understanding between School of Technology and CIM-India : 5/10/01

[7] CIM-India program Handbook (www.cimindia.org)