

FRAMEWORK FOR THE ASSESSMENT OF AN ENTREPRENEURIAL ORIENTATION OF THE UNIVERSITY

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ABSTRACT: *With changing economic conditions and the decrease in white collar jobs, the present day universities are experiencing a strong pressure to be financially sustainable. Many universities are undergoing a transformation to move from the traditional job of teaching and research to an active participation in their regions economic development. Historically the universities were engaged in producing a work force to work for the large organizations and governmental jobs with a very less focus on entrepreneurship. Over the past decade some of the universities have become sustainable by enhancing their entrepreneurial orientation as they have encouraged entrepreneurship among their faculty, staff and students. This has resulted in to a direct involvement in supporting the development of innovative new businesses through research and development, teaching and university business incubators. This has further led to a development of industry-academia linkages resulting in the commercialization of university research. Despite a steady growth and the trend towards an entrepreneurial orientation, there is no holistic framework to assess their orientation towards entrepreneurship. Therefore at present there is a strongly felt need for a viable assessment framework. This paper is an attempt to fill this gap by enhancing a conceptual clarity and providing a viable framework for assessing the entrepreneurial orientation of the university.*

I. INTRODUCTION:

During the past two decades, there has been an emerging trend in universities for a more direct involvement in supporting the development of innovative new businesses. This proactive role, though generally motivated by a desire to participate in regional economic development efforts, also serves to develop partnerships with new companies, and reap benefits from the commercialization of the university's own research [1,6,7].

Universities have a significant impact on the economies of the communities in which they are centered as well as the economies of other regions via the presence of their graduates and their research. The contribution of University of Ottawa and the Carleton University is instrumental in the creation of the Ottawa's Silicon Valley North technology cluster [2].

The movement toward university commercialization activities in Europe can be divided in to two waves. First, in the 1980s, science parks aimed at attracting companies were established: then in the 1990s the focus shifted to spin offs and patenting / licensing activities. The overall challenge to implementing commercialization activities is integrating them with more traditional teaching and research activities. Recent initiatives include infrastructure reform, institutional innovations to promote an entrepreneurial culture, and establishment of patenting and licensing offices and business incubators [3].

Over the past 10 years, Russia has seen a similar shift by applying the new philosophy of the University as an entrepreneurial organization. Several strategies have been successfully tested e.g. active self-development in the form of commercialization of science and technology, setting up special administrative groups, and increased interaction with regions [4].

Many high-tech companies - local firms large and small, as well as international outposts of companies ranging from Microsoft and Sun to Siemens are being built around prestigious Tsinghua University, creating what will be a world-class technology incubator. Tsinghua is building an entire infrastructure of business support, from venture capital to legal services to property management. That, of course, is part of Silicon Valley's secret sauce - an entrepreneurial

infrastructure that can take a company from napkin doodle to business cards and a health plan in a week [5].

Despite a steady growth and the trend towards an entrepreneurial orientation, there is no holistic framework to assess their working and performance. Although a few models or Frameworks do exist to assess the different entrepreneurial actions of a university, yet they are not holistic in nature and do not provide a complete picture. Therefore at present there is a strongly felt need for a viable assessment framework.

This paper is an attempt to fill this gap by enhancing a conceptual clarity and providing a holistic framework for assessing the entrepreneurial orientation of the university. This framework is built upon the existing knowledge base in the areas of (1) University entrepreneurship (2) New venture creation support (3) the university's involvement in technology and business development support (Business incubation support, new venture creation) (4) the commonly accepted organizational effectiveness approaches

The subject framework will enable and help in measuring this orientation and contribution to new venture creation. The framework will capture most of the entrepreneurial dimensions. The framework will provide a systematic approach to the assessment of the entrepreneurial orientation of the university and is applicable for a wide range of universities for which data is available.

II. LITERATURE REVIEW:

A) Entrepreneurial Orientation

In 1998, Burton R. Clark introduced the concept of entrepreneurial university. His main finding was that in order for a university to be entrepreneurial, the organizational culture must be characterized by a collective mindset in which entrepreneurship is facilitated in a combined top down & bottom-up fashion, including a high tolerance for risk taking. An entrepreneurial university is an organization where risk taking is a normal phenomenon when new practices are initiated, and where entrepreneurship is often perceived as taking innovative practices to a commercial profit-exploiting stage. The way in which the transformation of universities into entrepreneurial universities took place was through

collective action. Clark noted that this transformation occurs when a number of various individuals come together and agree on a new organizational vision. His observations on the pathways to the new entrepreneurial university vision are as follows.

1. At the heart of an entrepreneurial university one finds a strong and expedient central decision making body able to react to expanding and changing market conditions.
2. Entrepreneurial universities have active units, both in main stream academic and specialist fields, which positively employ a dynamic and flexible approach to external activities and third party relationships. Entrepreneurial universities experience growth in units that cross organizational boundaries more quickly than traditional academic departments. They often do so through linking up with outside professional organizations and groups.
3. The funding base of the entrepreneurial university displays a high degree of diversity where new and changing sources of funding appear on a continuous basis. Since an entrepreneurial university displays a high risk profile, access to discretionary funds and a widened financial base is vital.
4. The core academic units have adopted an entrepreneurial ethos. For an effective transformation to take place the academic core units need to aspire to becoming entrepreneurial units able to link with external organizations and derive third stream income. From an organizational point of view, securing the support from the academic heartland is perhaps most difficult part of being an entrepreneurial university and is often more difficult in social sciences and humanities than in technical sciences. In order to diversify activities and funding effectively entrepreneurs must have management authority and power and this implies a change of power relations that needs to be accepted by departments and faculties. Consequently, the academic heartland accept a modified version of the traditional university management hierarchy, where administrative managers have power equal to that of professors, department heads and research team directors. Furthermore, the academic heartland must accept that research achievements may be only one of several ways to be merited within the university, others being the ability to teach innovatively, transfer knowledge to the external community, create bridging mechanisms, etc.
5. The culture of the entrepreneurial university embraces entrepreneurship in to its working practices and in general change is simultaneously welcomed, fostered and absorbed by the organizational culture.

Entrepreneurial orientation and education [6] fosters risk taking and the creation of new business ventures; increases the likelihood of graduates being self employed; causes a significant positive impact on the income of graduates; increased job satisfaction from increased income; contributes to the growth of business, especially small ones; promotes the transfer of technology from the university to private sector; and promotes technology based firms and products.

Incorporation of entrepreneurial culture in to research activities has resulted in an increase of spin-off companies [7].

B) Assessment of the entrepreneurial orientation of the University

American sociologist Burton R. Clark [8] is the first one to introduce the idea of an entrepreneurial university and proposed some organizational practices against which a university's entrepreneurship can be measured.

Allan et al (OECD 2006) [9] undertook a study to evaluate four very active ECIU universities. To evaluate and quantify their level of entrepreneurship, twenty best practices for an entrepreneurial university were extracted from Burton R. Clark's model. Each of these practices was scored on a 1-5 scale. The study identified specific problems and resultant recommendations regarding the individual universities studied. Five to six individuals from each university were interviewed that were in a position to influence the direction of the university in question.

Menzies [10] conducted a research study in analyzing the role universities are playing in nurturing and developing high technology entrepreneurs. A framework illustrating the embedded nature of an academic disciplinary area from the university administrator's perspective has been proposed. Entrepreneurial embeddedness includes social, economic, cultural and political aspects, represented by the university's internal and external environment. This embeddedness alerts us to many regional variations that occur due to the different location, history and stakeholders associated with a university.

Bert Twaalfhoven) [11] conducted a comparative study on 8 centers of Dynamic Entrepreneurship (3 US, 4 Europe, 1 Russia). These eight universities serve as entrepreneurial hubs with different approaches. A framework comprising of eight factors is used to analyze each of the university.

Christopher & Eryadi [12] conducted an exploratory study on University entrepreneurship centers in Australia and New Zealand. This exploratory study reports and analyses the University Entrepreneurial Centers in terms of age and affiliation, the amount and source of funding, the priorities of their activities and the levels of success they have achieved. This study is useful to find out how successful the University Entrepreneurial Centers are. However the authors recommend that it is important to have a framework and guide lines to assess the performance of these initiatives.

Mian [13] provides insights for policy makers and aspiring entrepreneurs into the various facility design, management policy, and value added aspects of University business incubators. This research presents a checklist of issues that should be addressed by those seeking to establish a new University Business Incubator or to evaluate an existing one.

Mian [14] developed a framework assessing and managing the performance of the University Technology Business Incubator as a tool for new venture creation. The proposed model is comprised of three performance dimensions

Table 1.

List of Factors in Assessing the Entrepreneurial Orientation of a University

1. University Policy, Vision and System (Internal Environment)
a. Organizational structure (Flat Vs Hierarchical) (<i>8th Practice of Clark, B.R. 2005</i>)[15, 18, 20]
b. Strategic Plan (<i>7th Practice of Clark, B.R. 2005</i>) [15, 18, 20]
c. Emphasis on a central steering core (<i>1st Practice of Clark, B.R. 2005</i>) [15, 18, 20]
d. Independent of Govt funding (<i>2nd Practice of Clark, B.R. 2005</i>) [15, 18, 20]
e. Governance Mechanisms i.e. Management control systems e.g. MIS, Project Management, Financial Management System.
f. Active Management Support
g. University Board/Senate Q: What is the actual background of the members i.e. University, Venture capitalists, Industry, Public sector, Consulting, Bank and others.
h. Competitiveness of campus infrastructure (<i>2nd Practice of Clark, B.R. 2005</i>) [15, 18, 20]
i. Lump sum Budgeting (<i>5th Practice of Clark, B.R. 2005</i>) [15, 18, 20]
j. Attractive environment for young researchers. (<i>16th Practice of Clark, B.R. 2005</i>) [15, 18, 20]
k. Interdisciplinary research structure (<i>17th Practice of Clark, B.R. 2005</i>) [15, 18, 20]
l. Entrepreneurship driver: From where is Entrepreneurship being driven Faculty or school i.e. Engineering school, Faculty of Agriculture
m. Location (Proximity to high tech firms) <i>University Entrepreneurship: A Taxonomy of Literature</i> [16]
n. Culture <i>University Entrepreneurship: A Taxonomy of Literature</i> [16]
o. Historical Context <i>University Entrepreneurship: A Taxonomy of Literature</i> [16]
p. Incentive System for Faculty <i>University Entrepreneurship: A Taxonomy of Literature</i> [16]
2. External Conditions (Environment)
a. Industry R&D funding
b. Govt funding
c. Market opportunity
d. Industry attractiveness
e. State level economic growth
3. University Resources
a. Faculty
i. Motivation Q: Can academics make money out of their science? <i>University Entrepreneurship: A Taxonomy of Literature</i> [16]
ii. Experiential background <i>Teresa V. Menzies</i>
iii. Business Knowledge / Market understanding
iv. Involvement / Cooperation
v. Exposure to external agents
vi. Perception Q: How do the faculty perceive entrepreneurship?
b. Physical infrastructure Q: Are these facilities available? What is the nature of contribution of these facilities towards entrepreneurship?
i. Pre incubation centers
ii. Business and technology Incubators
iii. Science and technology parks
iv. Laboratories
v. University Entrepreneurial center
vi. Service offers for spin off / out companies
vii. TTO (Business Capabilities, Experience)
viii. Patenting and Licensing Q: Number of patents issued to university faculty and students
c. Technology: Expertise of the University
i. Quantity and Quality
ii. Well established technology transfer process (<i>18th Practice of Clark, B.R. 2005</i>)[15]
d. University Funding
i. University funding for new ideas Q: Does the university provide any seed funding for research.
ii. Funding for Business plan competitions
iii. University Funding Q: Where does the university funding come from? I.e. University, Industry, Public, Banks/Venture capitalists, Private, tenants and others.
iv. Additional funding through cash cows (<i>12th Practice of Clark, B.R. 2005</i>)[15]
v. Attractiveness for endowments. Reputation, its plans and alumni attract donations. (<i>15th Practice of Clark, B.R. 2005</i>)[15]
vi. Total yearly income of university from commercialization of research. <i>HEC Manual Pakistan</i>
4. Out reach, Collaborations and Linkages
a. Out reach programs for regional entrepreneurs
i. Mentoring programs: Advice for investors, helps finding financing

ii.	Start up workshops before or during the formation stage of a business
iii.	Access to capital networks
iv.	Venture capital funds, Seed angels
v.	Summer school for young entrepreneurs
vi.	Use of News Papers, TV, Radio and internet for promoting entrepreneurship
b.	Linkages with entrepreneurs and other business bodies
i.	Entrepreneurs in residence
ii.	Links and networks with entrepreneurs and Founders of businesses Q: What is the impact leading entrepreneurs and business leaders?
iii.	Links with chambers of commerce and other trade and business bodies
c.	Partnership with
i.	University & Industry Partnership Q: Number of joint university-industry projects
ii.	Science parks, IT related companies, Technology clusters, established companies, and other universities. Q: Are some entrepreneurs using the University facility and labs etc? Some description.
iii.	Collaboration programs between the faculties of Biz and Engineering.
d.	Clusters: Is the university part of a cluster i.e. biotechnology, textile, light engineering etc
5.	Networking and Alumni related activities
a.	Alumni networks that enable entrepreneurs to interact with other entrepreneurs and investors i.e. there are about 13 MIT Enterprise forums around the world – they organize hundreds of meetings.
b.	Alumni involvement as mentors, Guest speakers, Alumni founders
6.	Entrepreneurship teaching activities <i>Entrepreneurship education at Universities- A bench mark study (2004)</i>
a.	Focused Approach (Formal Approach) i.e. MBA /Masters in entrepreneurship (In this approach faculty, students and staff are located exclusively in the academic area of business)
i.	How many students start their own business
ii.	Entrepreneurial contents in the MBA program.
iii.	Number of Entrepreneurship related courses
iv.	Name of courses i.e. Technology management, Opportunity recognition, Intrapreneurship, Business Plan development, Innovation management, early business development and internationalization.
b.	Unified Approach (Informal) (The unified approach targets non-business students outside the realms of business schools. There are two versions of the unified approach.
i.	In the magnetic model students are drawn from across a broad range of majors. Entrepreneurial activities are offered by a single academic entity, but attended by students from all over the university. All resources and skills are united in to a single “platform” that helps facilitate the coordination and planning of entrepreneurial activities. This approach has been applied at MIT.
ii.	In the radiant model a number of individual institutes and faculties are responsible for facilitating the integration and visibility of entrepreneurship activities, thereby enabling entrepreneurial activities to be adjusted to the specific structure of individual faculties.
c.	Entrepreneurship as an elective or required course.
d.	Entrepreneurial content in the curricula Q: Does the university promote the skills required for starting a new venture? I.e.
e.	Interfaculty / Department collaborations
f.	Executive education
g.	Entrepreneurship teaching focus i.e. textile, health, Agriculture, light engineering
7.	Research activities Q: Number of industry sponsored research projects at university
a.	Applied Research
i.	Research groups in innovation, entrepreneurship and technology
b.	Basic Research
8.	Students Entrepreneurial activities
a.	Student clubs
b.	Business Plan competitions
c.	Pitching of business ideas
d.	Support for Students Entrepreneurial activities
i.	Support for student business plan competition
ii.	Availability of Govt Funds
9.	Entrepreneurial Outcome
a.	New venture creation
b.	Expansion of existing business
c.	Education and training of SMEs

1) Program sustainability and growth 2) Tenant firms' survival and growth and 3) Contribution to the sponsoring university's mission. Colin [19] has developed a comprehensive guide to the world's new business accelerators.

A bench mark study on Entrepreneurship education at Universities conducted by National Agency for Enterprise and Construction (2004) across 10 US, 10 Canadian and 7 Danish Universities identifies diverging trends in the scope and magnitude of entrepreneurship activities across the 27 universities. American universities have the highest share of entrepreneurship students and the most extensive number of activities in entrepreneurship, followed by Canada and Denmark. This study has evaluated the universities entrepreneurial activities along five separate dimensions; education (scope), education (setup), institutional characteristics, outreach and evaluation.

Etzkowitz [21,22] discusses in detail the evolution of the entrepreneurial university and how it plays an important role. Marques [23] presented his findings of the case study of the university of Coimbra on how university-industry-government interactions changed the innovation scenario in Portugal. Shane [24] discusses the role university spinoff companies in wealth creation. Shinn [25] presented his findings on the role of Triple Helix model and the production of knowledge. Chevalier [17] discusses the Entrepreneurial orientation, technology transfer and spin-off performance of U.S. universities.

Researchers have mainly worked and analyzed the various dimensions affecting the entrepreneurial orientation of the university. The aim of this study is to look at these factors in a holistic way. This research provides a conceptual framework for accessing and managing an Entrepreneurial University.

III. FRAMEWORK FOR THE ASSESSMENT OF THE ENTREPRENEURIAL ORIENTATION:

The proposed Framework is drawn from the survey of existing body of knowledge in the area of University entrepreneurship, New venture creation support, the university's involvement in technology and business development support (Business incubation support, new venture creation) and the commonly accepted approaches to organizational assessment that provide the necessary building blocks for the integrative Framework.

Fig 1 provides a conceptual model for assessing the Entrepreneurial University. The left most side shows the internal and external environment in which the university is operating. The internal environment and motivation of the university to become entrepreneurial is strongly influenced by the university's top management, key stake holders and the external environment.

In order to realize these objectives, the university has to realign its resources i.e. hard ware and the software as mentioned in the second block diagram. These resources reinforce each other. Under the influence of the internal and the external environment, the software (faculty, administration, TTO, Alumni) leverages the hardware resources and executes the strategy outlined by the top management. The various facets of implementation are in the form of entrepreneurship teaching (for credit, embedding entrepreneurship in various courses), generating entrepreneurial activity for the university and the external community, research (focus on new venture creation and spin out companies).

All these implementation strategies lead to a varied outcome in the form of new venture creation and spin-off companies, expansion and development of existing business and the more and more involvement of faculty and students in venture creation and development. Moreover the spillover effect in the community results in stronger link of the university and the industry adding to the areas industrial base.

Other dynamic interactions are also taking place which reinforce the building blocks. These are shown in the form of feed back loops. Research in entrepreneurship enhances the knowledge base of the faculty and in turn has an impact on entrepreneurship teaching and community related activities.

The various outcomes have a feed back effect on the internal and external environment. The university's public image in promoting economic development in the form of new start up firms and providing entrepreneurship training is highlighted.

The new companies and the expansion of existing business and more and more students turning to entrepreneurial carriers brings knowledge, experience, networks and financial resources to the university. A detailed list of factors along with some explanation is provided in Table 1.

IV. CONCLUSION:

The application of this framework can be used as a bench mark to measure the entrepreneurial orientation of the university. The model lists the possible factors which contribute towards an entrepreneurial orientation. Although the framework gives a subjective answer, reasonable objectivity can be brought in to it by asking the respondents to rank the key variables. As an extension to the development of this framework, multiple cases of universities will be undertaken to assess the validity of the framework.

It is hoped that this framework will be benchmarking tool for the policy makers, implementers and various stake holders interested in the entrepreneurial orientation of the university.

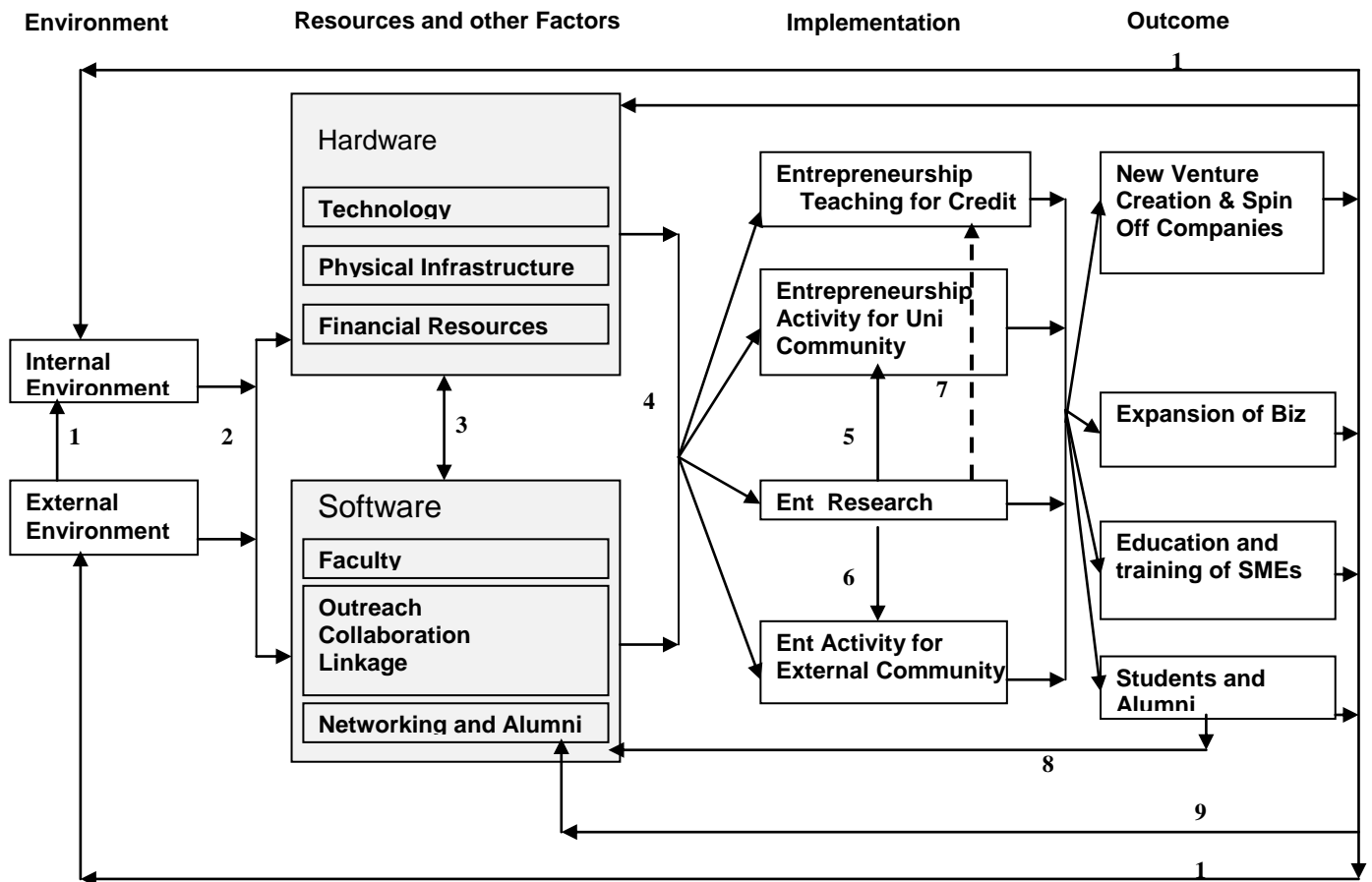


Fig 1. Framework for the Assessment of the Entrepreneurial Orientation of the University

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