Thematic Idea to Develop a Model Research University for Pakistan

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Abstract

Despite of tremendous efforts of the Higher Education Commission of Pakistan to promote research culture in its true spirit in the universities of Pakistan, the standard of the world universities and the quality of their research are far more forward than our universities. This study aims to develop a model research university for Pakistan at national or one each at provincial level which manages not only the university research, its quality, productivity & international standard, its direct link to the educational, social and economic activities parallel to the international standard and advancing the university's ranking of our country at international level Qualitative approach followed for data collection. Population of the study was the experts of Higher Education Commission of Pakistan, eminent relevant research personnel of Higher Education and heads of the research centres/institutes of the universities. By adapting non-probability convenience sampling technique, data were collected through a semi structured interview having open ended questions. Main themes were extracted from the ideas of the respondent experts which were analysed in the light of the secondary data particularly those of international university models and the research famed world universities/institutes. These extracted themes were converted into a framework of 4 pillared Research University Model for Pakistan and is termed as SIPO Model. SIPO stands for statutes(comprising of regulations, rules, SOPs, resources, micro & macro framework of the University), Inputs (comprising of HR, market based quality researches, innovations & inventions, entrepreneurial networks, entrepreneurial centres, like incubators, science and technology parks, spin-offs etc.),procedures(like teaching, research, selection, funding, finances, managerial, logistical, networking, R & D, marketing etc.) and outcome (like commercialization, social services, Enterprises/ connection, national & international triple helix model i-e university-government-industry relationship, innovations, transfer etc).

Keywords: SIPO model, research university, macro framework, micro framework, statutes, inputs, procedure, outcome

Introduction

Facilitation of research culture at universities in Pakistan is a hot issue nowadays. Though the government has taken steps which empower Higher Education Commission of Pakistan (HEC) to promote and flourish the quality research activities of international standard at

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universities but the professional competencies of the universities are still need practical steps to meet the international standards.

Unrelenting influence of globalization on the Higher Education, the universities are no more just the centres of knowledge its role is of innovative excellence, having a multi fold function of knowledge dissemination, commercializing of academic research, linking of industries with universities and a source of country's economic development (Ramli et al,2013). We have to stand parallel to the global standards of the Higher education in terms of increase in quality research, its development, commercialization, intake of research-oriented students, the doctoral faculty, establishment of the centres of Excellence, technological and IT parks and advancing the university's ranking at international level (Altbasch, 2013) so that the universities in Pakistan is at par with the international universities.

In connection to the prevailed environment of the international competencies, the current study attempts to remove this gap among the universities of Pakistan. This leads the concept of developing a Model Research University at national level or one each at provincial level which is the need of time.

Review of Literature

The innovative idea of Research University is a latest concept. History reveals that the German university of 19th century was considered as success model and was duplicated by US and many other countries (Atkinson & Blanpied, 2008).

The concept of Research University emerged in Prussia in the late 19th century, as an aftermath of the civil War in the United States. Till 1940, around one dozen American Universities were considered as top research institutes despite no financial support. In Vannevar Bush's report "*Science—the Endless Frontier "it* was recommended to the federal government to allocate fund for research at universities in the best interest of American's nation. So, the federal funding started in 1950 which strengthened "America Academic Research system". Other countries started to follow the foot prints of the "American's Academic Research system" to replicate the success of US research universities (Atkinson & Blanpied, 2008).

With this paradigm shift different university models have been proposed, the salient brief story of which is presented below.

a. University Models based on Regional Development

On the basis of activities of the Universities and its engagements to the regional development, four distinct models were developed by Trippl and his colleagues in 2015. They worked on the role of UK, Sweden &Australian universities to their regional development and proposed four distinct models of universities which

are: the Entrepreneurial Model, The Model of Regional Innovation system (RIS), Mode Two university model and Engaged University Model. These models emphasise multiple activities and outputs which are beneficial to the society and regional economy as well.

The Entrepreneurial University is well explained. According to the entrepreneurial model the HEIs are increasingly complementing their traditional missions of teaching and the research with a new one i-e economic development (Etzkowitz et al., 2000; Kirby, 2006; Etzkowitz, 2014; Guerrero, Cunningham & Urbano, 2015).

Through Patents and licensing, the universities perform a productive role in the regional development & competitive environment by commercializing their knowledge (Grimaldi et al., 2011) and a productive culture of business (Goldstein, 2010; Fayolle & Redford, 2014). According to Cooke et al. (2004) and Asheim et al. (2011), universities have a central place in the innovative product-based knowledge and in collaborative activities**.** On the basis of this The Model of Regional Innovative System identified which focuses more on the exchange of knowledge between the universities and industries i- e knowledge translation into products and services. RIS (Triple, 2005), the dominant regional growth (Lester, 2005) and the triumph knowledge (Asheim et al, 2011) the regional position of the universities varies. Within framework of the regional innovation system/RIS, the universities make an efficient and well organized system (Fritsch & Slavtchev, 2011) in order to transfer knowledge and to the regionally located mass (Uyarra, 2010; Kitson et al. 2009), called the knowledge transfer mechanisms the most usual than the commercialized knowledge due to patent and licensing.

According to one of the eminent theory of "new production of knowledge" (NPK), (Nowotny et al., 2001; Gibbons, 2013 the new prominent role of the universities is to produce new forms of knowledge and it referees as Mode 2 Model. MODE 2 approaches (production of new form of knowledge) seems a challenge for the MODE 1 approach (Knowledge transformation into products and services) of the universities. In a more precise way we can say that the traditional Mode 1 approach of the universities is linear one and the university research are complemented by interaction of various disciplines in order to generate knowledge (Nowotny et al., 2001). Key feature of the mode 2 are knowledge production "in the context of application", Heterogeneity in MODE 2 universities broadens the features like transparency, accountability and quality appraisal of the activities of higher education institutes to audiences beyond academic "peers". Among MODE 2 universities the common constraint observed are the national funding and directing of research priorities and the research areas of industrial, political and social importance (Shove & Rip, 2000; Klenk & Hickey, 2013). Universities are unable

to assess their research quality, its strengths and weaknesses and are thus dependent I the external bodies not only to guide them for quality research production but also to provide sources (Patel, 2016).

(b) University Models based on Internationalization & Globalization

Universities and Higher Educational Institutes perform a strong role in the development of society, economy, knowledge production, innovation, knowledge commercialization and university-industry partnerships of the region. Literature reveals that these concepts contain normative elements at an extent (Goldstein, 2010; Uyyara, 2010).As Globalization is the source of change in different life aspects of the society at different pace (Duan, 2002) because it pushes the universities towards greater international engagements (Altbach, 2004).The successful ad renowned models of the universities are focused always on research intensity, diversified funding, worldwide recruitments, University-government- industry linkages, and global collaboration with similar institutions and is termed as EGM i-e Emerging Global Model (Moharman & baker, 2008).

Knight (2015) also present examples of international institutions which share funding's, collaborate, share provocations and challenges. He also proposed three kinds of University models i-e satellite, internationally co funded and education glumerate models.

In satellite model the universities interlinked through satellite having satellite administrative offices and contact offices around the world as branch campuses etc, Similarly the internationally co-funded institutes asked on a partnership between the campuses of two to many partner universities/institutes from different countries which are cofumded/co developed mutually by the two to multiple partner institutions. (kick yemnee.2021). According to Education Glumerate model the three generations of international universities i-e classic, satellite and cofounded models collectively work under the umbrella of education glumerate where the local and the international education providers facilitate the students to select and match courses of their choice under the common offered credit system. (Knight, 2013)

Chan & Dim mock (2008) suggested two different models: the international and the Trans local. They also suggested a hypothetical third model called the globalist. These three models of internationalization depict many truths which reflect different realities and importance of international, national, and institutional contexts. This concept also explains the chance of being internationalized (Akalu, 2018) as the knowledge transfer mechanisms are most usual than the commercialized knowledge due to patent and licensing (Kitson et al, 2009).

(c) Some Global University Models

University systems can be categorized under three rationale models i-e the Equalizers, the Rationale, according to Samuel Martín-Barbero and Adrian Monck in one of their articles published on website of Times Higher Education, dated 26th May, 2018 which are the Equalizers, the Revolutionaries and the Globalizers.

In Pakistan a conservative traditional teaching-learning curricular activity still exists in majority of the universities and higher educational institutes of Pakistan which strongly affects the existence and the development of the most desirable research culture (Agha, 2015). Mashhood, 2015 also realized the same situation in Pakistan where the tradition to give more attention to the teaching is prevalent and attention to the research activities is least desirable. This old prevailed environment must be changed now because an international drift from traditional to modern drift universities is indispensible and the traditional environment of the universities cannot contribute effectively to the national development of the country.

Universities are facing difficulties in assessing their research quality and its comparative strengths and weaknesses. In this regard the universities and the research institutes are destitute and are dependent on the external bodies not only to guide them for producing quality research but also to provide sources (Patel, 2016).

The Higher Education Commission of Pakistan decided to establish ORIC offices (Office of the research Innovation and commercialization) across the Pakistan at universities. Major purpose of ORICs are to establish links for university research and to commercialize it with emerging and existing industries /companies/ firms/ commercial stake holders throughout the Pakistan and around the world as an umbrella Work closely with the researchers, chancellors and on campus Incubators. The objective of ORICs is to flourish the university's research and the efforts & outputs of economic development to improve the competitiveness of our industries by using the university innovations. Thus, the university's research will be a source of economic development for Pakistan. On the other hand, in Pakistan the universities have Quality Enhancement Cells (QECs) having the responsibility to streamline the research activities in the universities and to evaluate the research quality conducted by the staff and students.

Methodology

The research study is based on the qualitative data and depends on the opinion of the experts of Higher Education which is further analysed particularly in the light of the secondary data in order to

extract main themes and ideas to develop a framework for the Model Research University of an International Standard in Pakistan.The population of the study is eminent and relevant experts in the field of higher education, Heads of the Research Centres/Institutes working in the supervision or in collaboration with the public sector Universities of Khyber Pakhtunkhwa and the experts of Higher Education Commission of Pakistan. The confidentiality and anonymity of the respondents were maintained. A convenient random sampling technique adapted for the sample population. Semi structured interview having open ended questions were conducted from the sample population. The obtained qualitative data is further analyzed in the light of secondary data (literature) particularly those of the global perspective of the Research in the international universities/HEIs of developed countries and the international university models specifically the international, successful universities and models to extract Main themes/ideas. These main themes adjusted in a four pillared framework termed as SIPO Model for the first National research university of Pakistan.

Findings

Keeping in view the restless efforts of HEC since 2002 to develop a desirable research culture, the international paradigm shift in universities from its traditional role to the advance one, all paved the ways towards the establishment of the research university in Pakistan.in this regard the interviews were conducted from the eminent higher education experts and the common collective themes are narrated as following.

(a) A Serious Mind Set

The establishment of the "Research University" is unavoidable anymore and this fact is also realized by the Leaders and Government of Pakistan too. The government pledge to allocate the Prime minister house of Pakistan for the research university. Further a suitable GDP is also a point of focus. Seriousness of the policy makers and the policy implementers should be channelized in this regard. Hierarchical setup should be like the internationally renowned top ranked universities.

(b)Establishment

According to the experts at each province level after the situational analysis. A centralized, discipline based serious platform should be establish as research University research through which the universities of the Pakistan of those particular disciplines (for instance IT. Engineering, social/ Biological/Numerical/Physical/ computational sciences etc) get linked for the purpose of international standard researches.

(c) Planning & Policy

As this is aim based university therefore a very careful planning it requires. Similarly, it should be based on the policies of "quality research production" and development of the research culture and its implementation" should be with full dedication.

(d) Faculty/Subject Experts

In this model university, mix kind of the subject experts i-e both indigenous and internationally renowned one should be hired so that they collectively prepare our local scholar as an international level graduate who is well aware and well equipped with the tools and techniques that how to carry out international standard research and the practical implementation of the product information of these researches.

(e)Scholar/Student

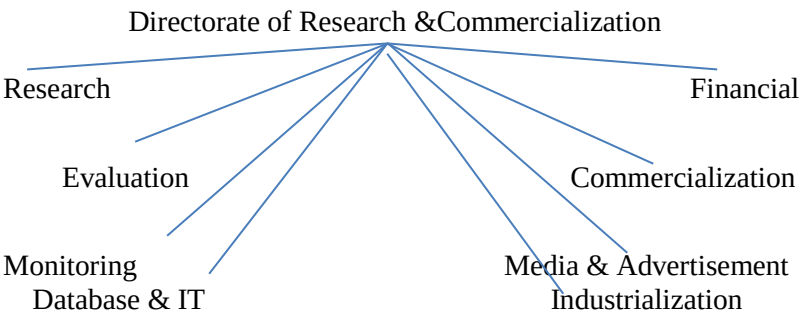
Students must be skilled for identification of the real societal and world problems and there fixing, research skills, critical thinking etc. like characteristics. Scholars shall be well aware to implement the research and knowledge with the industries and for the well-being of the society too through its practical implementation.

(f)Research

Quality Research should be the dominant/ pivotal component for this research university while teaching should be complimentary /supplementary component for the research university. Teaching should be in particular courses where the syllabi are rigor in their approach and mechanism while teaching should be research based in its approach which develops highly skilled and particularly "train for research" scholars.

(g)Framework

According to this at each province level there should be a centralized platform/a serious set up for research through which all the universities of the province will be linked. According to this we may connect all the universities under one umbrella and we may report to one established organization. Overall there should be a head (director general) for research works under the supervision of which different wings like Research, Evaluation, Monitoring and follow up, Financial, Commercial, Social, Data Base & IT, Media & Advertisement wing and Industrialization wing may work.



(h) Infrastructure

The idea of Research University is an expensive idea therefore for results there should be no compromise on its infrastructure and good facilities.

(i) Financial Aspect

Financially the research university must be a strong university where a multi sourced financial component exist having enough funds. These sources should be government allocated. charity based, philanthropic, special research funds, science & technology funds and of the university's own research product sale funds.

(j)Administration

Professional, Competent and dedicated administrators will play a vital role in implementing the mission and vision in its real spirit with professional competencies with a developed aim based and skilful attitude. Overall there should be a director General as an administrative head of this model research university.

(k)Ethical Component

As per this component there must be proper check and balance to ensure honesty and passion of the staff, teachers and scholars.

(l) Environment

Free and independent thinking environment should be provided to the scholars where they focus on productive researches and produce entrepreneurs with innovative ideas. The graduates should have the ability to practically implement their ideas for the welfare of mankind and wellbeing of the society in order to create job opportunities to the community.

(m) Role of Management in the Research University

Management of this model university will be professional in their domain like 3rd & 4th generation Universities. The local experts just like the 4th Generation Universities will be given preference. Scientists will be hired on part time basis like in 2nd generation universities. The role of management has to find effective approaches to attract student's including adopting and practicing the culture of quality research.

(n) Evaluative Criteria for the Model Research University

Evaluative criteria will be adopted for the "performance check" of the model research university in terms of quality and quantity of the research, performance of the researchers, Innovation, Commercialization and Marketing, Networking, Linkages, Support Facilities, Finances, Students intake, Staff performance and competencies etc.

In the light of the information's based on the expert's opinions, observations, experiences and the knowledge extracted from literature as secondary data source, a model research university is proposed to be establish at national level in order to cope up with the current research scenario of universities and to boost the Higher Education and Research with that of the international standards.

Statutes	1.Rules Regulations and Statutes. 2. Standard Operating Procedures 3.Macro Framework (Institutional requirement) i. Mission of the university ii. Vision of the university iii. University- a knowledge business unit (KBU) iv. Academics & Research – a strategic business unit (SBU)

Inputs	1. Resources a. Human (professors, staff, graduates, researchers) b. Physical c. Financial d. Data Base & Information Bank **2**. Micro Framework (Organizational Requirements) i. Entrepreneurial Management Unit (EMU) a. Office of the industrial relations b. Office of the international relations entrepreneurial Centres/ schools/ incubators/IT parks/science & technology centers/spin off etc. d Entrepreneurial offices ii. IPU (Intellectual Property Unit) iii. TMU (Technology Management Unit) iv. KMU (Knowledge Management Unit) v.VCF (Venture Capital Fund) vi. RDU (Research & Development Unit) 3. Market based quality researches 4. Inventions and innovations 5. networks for entrepreneurial works
Procedures	1. Teaching 2. Research 3. Selection 4. Funding and Finances 5. Managerial 6. Logistical 7. Networking 8. Research & development (R & D) 9.Marketing
Outcomes	1.Commercialization 2.Social services 3.Enterprise/ connection National: University-Govt-Industry (Triple Helix Model) 4. International: Innovative/Transfers

Proposed "Research University Model" For Pakistan

From the analysis of participants' responses (qualitative) with literary data and literature review, the following framework is proposed for the Model Research University and is abbreviated as SIPO (Statutes-Inputs-procedures-output) MODEL for Pakistan. This model has the characteristics of both third and fourth generation of universities. The model is presented in the following Table.

Table: *The SIPO model*

Objectives

The proposed Model Research University is expected to explore its intellectual capacity aimed at knowledge advancement particularly in the field of research. It is expected to be a model university which aims to promote academic excellence, Increase the Research activities in terms of quality and quantity, its Development and Commercialization of the research products/outputs at national and international Level. Research University should be a source of regional admiration, international competitiveness and attraction for the international students and professionals in terms of its publications and research quality research work. Similarly, this Model University should trigger the local economy through Knowledge advancement.

Statutes

In the proposed model research university the statutes are the basic laws on the basis of which a research university can be establish. Statutes should be the skeleton of Research University. Statutes should focus on the areas like Rules and Regulations, Procedures /SOPs, Resources, Funding's, Working Domains, frameworks and outcomes.

Macro Framework

Macro framework of the model research university will comprise of institutional cause and requirements collectively. Which are briefly identifies as following:

a. Mission of the University

The mission of this university is to focus on the productive and innovative research based teaching where scholars engaged in discovering and sharing the knowledge to perform a dynamic role for the process of sustainable progress and development of the country particularly and to improve the condition of humanity in general.

To create the appropriate structure for the development of scientific research and to support multi-disciplinary research where faculty and students are inspired and challenged to push the boundaries of knowledge creation and supporting community.

b. Vision of the University

internationally acknowledged and to be famed nationally and internationally for local welfare and international wellbeing by successfully adaptation of its framework.

c. University- a Knowledge business Unit (KBU)

This research university should be a hub of knowledge which contains, creates, disseminates and transfers much knowledge that is needed to the innovation of markets, companies and society. The research university has its concepts of social and economic welfare which is materialized throw innovative and entrepreneurial activities.

d. Academics and Research – a Strategic Business Unit (SBU):

Strategic business unit (SBU) will be a subunit under the umbrella of "academics and research" of the proposed research university. It will independently work with its own objectives and mission. Formulation of independent business strategic plans and the relevant marketing strategy will be its main domain. The SBU offers the corporate forum of the parent organizations at the door step of the university. It will develop its own brand identity, independent businesses and the relevant mandatory marketing with a great degree of freedom to the management. All corporate operations will be properly assigned by the Strategic sub unit of the university that not only will raise the efficiency but will also focus the market trends. This is in fact "all fits in one strategic approach".

It would operate in a competitive market space that is separate from other divisions in the corporation. The main good thing of establishing SBU in the university is that it would create a strategically focused management structure that is not interfered by the wide product range of the corporation.

2. Inputs

The principal inputs of the proposed research university are human resources (university staff, faculty, university students and researchers) while the innovations, inventions, entrepreneurial networks, incubation centres, science & technology parks, market based productive researches etc are among the other input entities. Processes /procedures are the result of inputs which are presented below.

Microframework

The organizational framework defines the products and service flow of the model and comprises an overall micro framework of the model.

a. The Entrepreneurial Management Unit (EMU)

The Entrepreneurial Management Unit of the research university will comprise of the office of the entrepreneurial, office of the regional-international relations and the entrepreneurial centres /schools.

The EMU will endeavour to upgrade the academic work in terms of methodological skills, conceptual depth and managerial applicability. EMU will do efforts to improve the entrepreneurial successes for the students and practitioners of Research University not only locally but worldwide too.

The entrepreneurial pursuits will be making easy through EMU. This unit will concern with the experimentation and innovation in products, services, Processes and business models. The main function of the EMU will be to identify, analyse and to study the antecedents and consequences of the entrepreneurial opportunity for individuals/organizations /industries/companies/factories etc. Similarly, the EMU will also seek to analyse the financing entrepreneurial ventures by analysing the antecedents and consequences about the local and international funding decisions.

b. Intellectual Property Unit (IPU)

Universities are the source of innovative knowledge and technology production which is a great source of societal and economic benefit of the country therefore it should be ensured to maximize and to protect this innovative knowledge and technology production simultaneously through a vigorous and robust IP policy. The main function of the IPU/ Intellectual property unit will to provide proper dissemination and advertisement and the intellectual protection side by side to the universities and research centres while being in the hands of the consumer. IP issues should robustly be addressed by the IP unit of the university in order to flourish the intellectual ideas/work/laboratory discoveries within the walls of the universities to the market place. For the successful businesses and to reap the real advantage of their intellectual work and inventions, the research university must have a robust and rigor IP unit.

(c) Technology Management Unit (TMU)

The Technology Management Unit in the research university will link up the technology relevant inventions and innovative engineering related knowledge/concepts with business management.

The Technology Management program at UNI provides students with a broad background in the use of technology management with human, material and information resources. It will link concepts of engineering and advances in technology with business management

and organizational skills. The main function of this unit in the research university will be to manage the system, new start-up ventures, business plans, projects, organizations, contract assessment, trainings, and resources, working environment, behaviour, quality, documentation, industrial relations, legal issues and responsibilities.

(d) University-Industrial- Government Linkages/Triple Helix Model

since long the HEC is trying to develop connection between the universities and industries but as far as the government is kept aside from such linkages it might not be successful therefore government must play its active role in coordinating the industries with the universities in a proper way where both the components i-e the universities and the industries share some of their activities with each other like purpose, research based knowledge, production, technology, financial aid, marketing etc). This is a regional and indigenous level novel approach which supports the concept of knowledge-based economy wherein the industry act as an engine of economy while the education-government represents the social aspect.

According to the famous concept of the "third mission of the universities", here the universities play the role in regional economy too by enhancing competitiveness. In order to achieve this objective a strong network towards economy and the state is necessary.

e. Research and Development Unit (RDU)

The main objective of the RDU of the research university will be to plan & promote the research culture, research skills and the research attitude among the faculty and students. It also aims to enhance the research quality and the educational experience.it will helps in the development and advancement of research in topics relevant to the national and international community. Among the main responsibilities of this unit are:

1.Formulation of policies & procedures.
2.Suggest guidelines for R&D unit.
3. Develop plans to achieve relevant performance Indicators as per the university's strategic plan.
3. Plan preparation for the university keeping I view the research interest areas of faculty members.
5. To improve research skills of faculty members and student's ad to improve & update courses, lectures, and workshops.
6. To Enhance research culture and develop research ecosystem of students
7. Launching Research Assistants Program and to establish research groups.
7. Facilitate and provide information related to funded and non-

funded research grants and encourage faculty members to apply.to Seek funds from businesses and other organizations.

8. To focus on the collaboration with national and international business organizations and schools in order to conduct the productive distinguished research.
9. To develop Partnership with well-known institutions such as IEEE/ Springer/ Elsevier/ Emerald etc.
10. Acknowledging the productive research work publically by rewards, awards etc.
11. To Enhance the image through various activities and registering in ORCID, Google Scholar, Scopus ID, Research gate, and LinkedIn etc.
12. To Originate International Journal with ISSN and indexing with Scopus and then Web of Science (WOS) etc.

f. Centres. Incubators, Science & Technology Parks

In accordance to the global trend, research university should give due weightage to the strategies and instruments in order to promote innovative work and to create entrepreneurial ventures. In this regard the business incubation centres, science and technology centres and IT parks like incubation schemes with the main aim of establishing potential enterprises, commercialization of knowledge and technology will be strengthened. This will create several benefits for instance employment, income, commercialization of Knowledge & Technology.

As today the trend is towards the holistic approach to provide converged services therefore not only the conducive infrastructure is necessary in order to promote scientific research and its effective utilization but the intensive capital investments is also of prime importance to utilize the intellectual capital in a beneficial and effective way.

4. Processes & Procedures

Here in the proposed model, processes and procedures are the most focused errorless entities as the proposed university model is a project of an innovative idea wherein the "outcomes" depends on the logically interrelated continuum translation of statutes/laws, inputs & Procedures.

For the translation of statutes and inputs of the proposed model into the outcomes of the model a series of processes like teaching. Research, managerial, logistical, commercialization, selection of students and staff, funding and finances, networking, innovative research and its development etc all are of great importance.

In the proposed model the multilateral interactions among the university students, staff, entrepreneurial centres, industrial

researchers' ad their industries, policy makers, publishers, society etc are all be greatly and carefully focused processes.

Note: *In this Proposed Model, an obvious overlap between some of the processes is evident but still these elements mentioned separately because of their utmost importance and for the sake of not being taking light.*

Funding and Finances

For the Research University, funding for Higher Education and Research as well should be allocated through state appropriations. On the other hand, the university should also have enough sources like tuition fee, philanthropic money, auxiliary services, government aid and funding's, grants from miscellaneous sources, endowment funds, invested income and capital, income from sale out knowledge and research products, income in the national and international markets, research projects etc to achieve their aim and to maintain the quality of provided education and training.

Though at every step the utilization of money with effective plan and its proper auditing is no doubt of utmost importance. Here it is also suggested that for the proposed model the university may work on the "Responsibility Cantered Budget (RCB) tool". The tool is effective enough in the world's successful universities for instance in the US universities. The RCB, an appropriate budgeting tool will be helpful in achieving the goals and objectives of the proposed Model University.

4. Outcomes

Outcomes of the model research university are the results of the Statutes, inputs and procedures (SIP). Outcomes are the set of considerations having significant effects on the society holistically particularly in the socio-economic development, human development, innovations and direct linkages of the knowledge with industries.

Conclusion

For convenience the proposed model is abbreviated as SIPO model which means statutes-inputs-procedures-outcomes model of Research University. SIPO model will run under the set of considerations in terms of statutes, rules, regulations, standard operating procedures, mission and vision of the university and institutional requirements. The input involves resources, organizational requirements in terms of centres, units, offices; "procedure" explains many procedural processes like teaching and research; outcomes involve commercialization, national and international innovations.

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