Centre for Innovation and Entrepreneurship
Research, Innovation & Commercialization (RIC)

Policy Document, 2012

Contents

CHAPTER 1: INTRODUCTION

By definition, a "University" is a place for free exchange of ideas, where research and teaching advance side by side for the general betterment of an appreciative society. In institutions of higher learning, teaching and research are not parallel activities – both are part and parcel of the overall learning process. Therefore, institutions of higher education where R&D is not at par with teaching, usually the most common excuse being that the faculty is too committed in teaching and do not have time for research, are compromising on standards of education and performing only half of what they must do to fulfill their primary commitment. Additionally commercialization of knowledge and technology is an essential precondition for improving quality of life. Globally, entrepreneurship has appeared as a major source for converting knowledge, ideas or inventions into successful products or services. Small firms started by entrepreneurs created almost 95% of jobs in USA in the last decade. According to GEMS survey 2001, the major reason for relatively higher unemployment in Europe and stagnant economy of Japan is the lack of entrepreneurial activities in these regions. Faculty and students of universities like MIT, Cambridge, Stanford and others have developed very successful businesses from university R&D projects. These businesses have created millions of jobs and generate revenues in billions of dollars annually.

For a developing country like Pakistan, the importance of converting knowledge to practice and injecting this knowledge based input into our economic and social growth is a requirement which can not be over emphasized. The prime responsibility in this regard falls upon a handful of scholars known as the faculty, from whom the country has great expectations. While socio-economic progress of a country is dependent upon research and development, a university too requires high quality and substantial quantity of research activity, to progress and to maintain its name and reputation.

National University of Sciences and Technology (NUST) with the mission "*to develop NUST into a comprehensive research led university, with the focus on technology, innovation and entrepreneurship*" has devoted significant attention to R&D and its commercialization. In consonance with this, NUST established a Directorate of R&D with an aim to propagate/establish a research culture at NUST which caters for the national needs. Subsequently, a Research & Development and consultancy policy was formulated and approved in 1997 which was updated in February 2000 and then in December 2004. Over the recent past the Higher Education Commission (HEC) has put its emphasis on directing universities towards changing the economic landscape. In this context in January 2011, NUST received guidelines from HEC for forming Offices of Research, Innovation and Commercialization (ORIC). While some of the essential ingredients required by HEC for formulation of ORIC were already functional at

NUST, a need was felt to reorganize the present setup exactly in line with HEC requirements. As such the former R&D Directorate was renamed as Research Directorate and another Directorate of Innovation and Commercialization (I&C) was created. By combining these two directorates ORIC at NUST was created so that an ecosystem for innovation centric R&D and its commercialization could be nurtured at NUST. With the reorganization of the research setup, NUST research, development and consultancy policy also needed a major revision. This policy has therefore been redrafted to cater for the needs of this new setup.

1.1 Objectives

Main objectives of ORIC are to

i. **To establish and maintain a Research culture at NUST.**
ii. **To ensure that the Research pursued at NUST has relevance to the community and society.**
iii. **Commercialize R&D performed at NUST.**
    a) In short term identify commercial and industrial uses of solutions and technologies developed at NUST.
    b) In medium term align R&D activities at NUST with local and global commercial and industrial needs.
    c) In long term facilitate creation of new industries based on R&D performed at NUST.
    d) Promote industry focused multidisciplinary R&D.
iv. **Promote training and education related to entrepreneurship.**
v. **Improve productivity and quality of services and products in industry.**
    a) Provide professional development training and coursework.
    b) Effective value-add consulting services.
vi. **Be a catalyst for creation of new industries.**
vii. **Create job opportunities for NUST graduates.**
viii. **Achieve financial Independence for NUST.**
    a) Reduce NUST dependence on direct government financial support.
    b) Achieve financial sustainability.

1.2 NUST-RIC Eco-system

NUST believes that seats of higher education cannot operate as isolated islands of knowledge; for knowledge has no value unless it is shared and focused on current needs. Therefore, bridges need to be built, that connect these knowledge-islands to the industry-clusters as well as with the community at large. Keeping this in mind, NUST has formulated an integrated, interdependent Research and Development/Knowledge

Management Eco-system that helps in establishing and consolidating Academia-Industry Linkages and further helps in commercializing research. This includes the Technology Incubation Center, the first of its kind in Pakistan, which NUST pioneered in 2005 and has since provided needed services to entrepreneurs. Professional Development Center (PDC) and Science and Technology Ventures (STV) have also been in place for several years. In 2011, following HEC's vision, all these organizations were brought under one umbrella of NUST RIC Ecosystem. All these offices are housed in Centre for Innovation and Entrepreneurship (CIE) NUST.

1 The Centre for Innovation and Entrepreneurship

a. Technology Incubation Centre: The Centre has been established to facilitate and support the innovation engine of the University. It is the first model technology business incubator of Pakistan established under the academia, to provide an environment that attracts and nurtures technology based start-up companies, and transforms them into commercially viable enterprises. TIC provides a platform for NUST faculty/students, having commercially viable R&D output, to establish their own start-up companies in order to commercialize their R&D work as entrepreneurs. The objectives of TIC include fostering an entrepreneurial culture, by providing the students and faculty of NUST, an opportunity to transform their technology-based business ideas to reality. These facilities are also open to the general public, provided they contribute to NUST knowledge base. It further aims to facilitate the availability of NUST resources to the incubatees in a mutually beneficial way by liaising with private/public sector funding sources, government agencies, industrial associations, chambers of commerce and industries to provide facilitation and networking for Incubatee companies.

b. Science and Technology Ventures: ST Ventures NUST is the first holding company to be established in academia in Pakistan. It acts as a platform for the creation of new enterprises by commercializing R&D output for successful businesses.

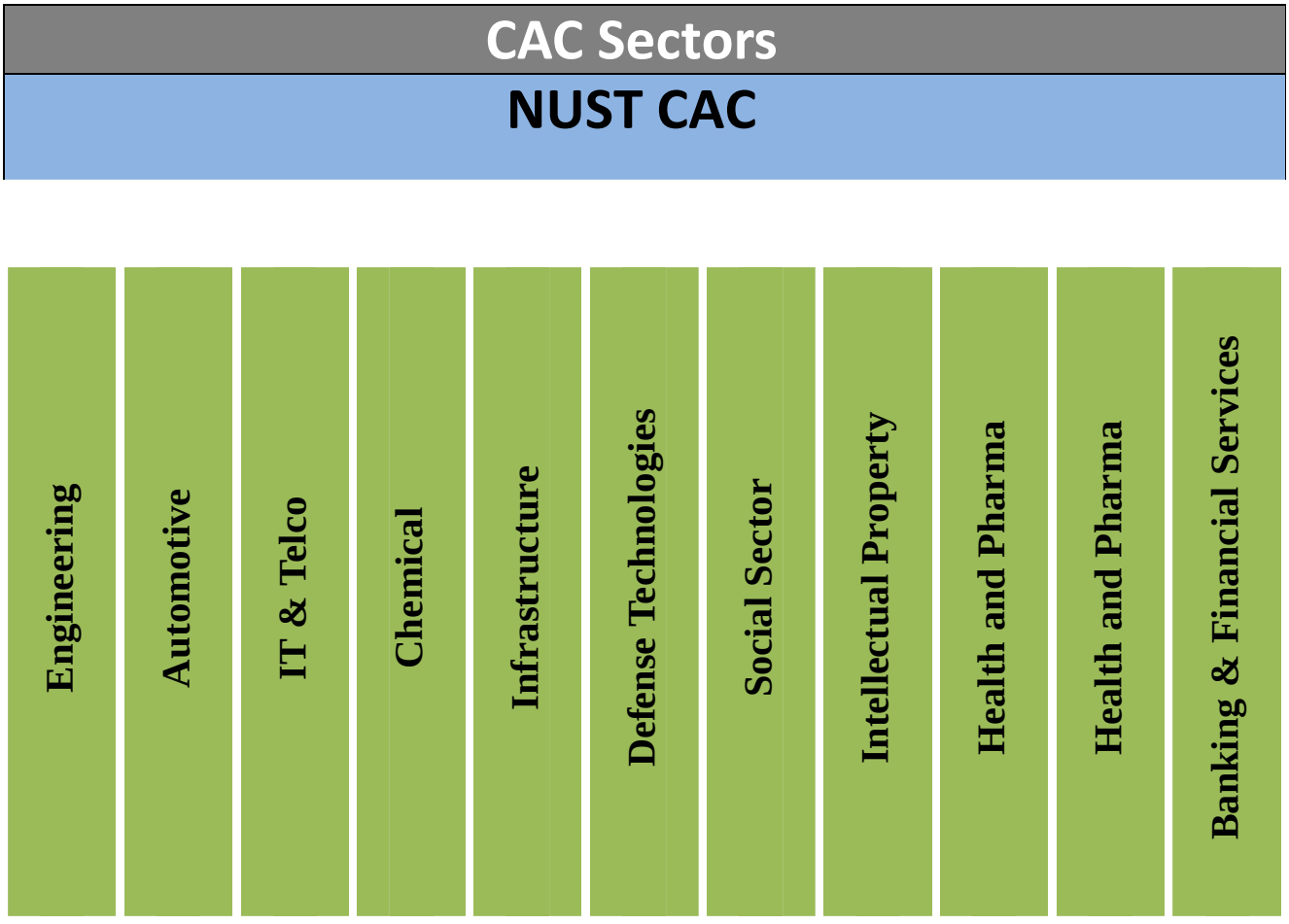
c. Professional Development Centre: Enables working professionals to remain updated with the latest developments in their related disciplines thus enhancing their knowledge, employability, and managerial skills. It also greatly helps towards building academia-industry linkage.

d. Research Directorate: The Directorate of Research established at NUST is acting as a focal point for providing guidance and support to the constituent institutions in all activities related to research & development. As such, the Directorate has a significant role to play towards achieving NUST vision. The mission of this Directorate is to facilitate and co-ordinate research activities of NUST constituent institutions and to liaise with other national as well as international academics, research and industrial organizations to facilitate research at NUST.

e. I&C Directorate: The role of I&C Dte is to encapsulate NUST's research and intellectual property opportunities at the earliest stage, and to translate these benefits to industry by working closely with the industry through partnerships, collaborations and licensing.

2 Corporate Advisory Council

CAC is the epitome of university-industry collaboration aimed at producing knowledge for application in industry and society for equitable socio-economic development in Pakistan. To this end, the council has significantly allowed NUST to utilize its integrated R&D platform for delivering innovation-based solutions to the Pakistani industry. CAC combines thought-leadership from 11 key sectors across the national economy which are as follows:



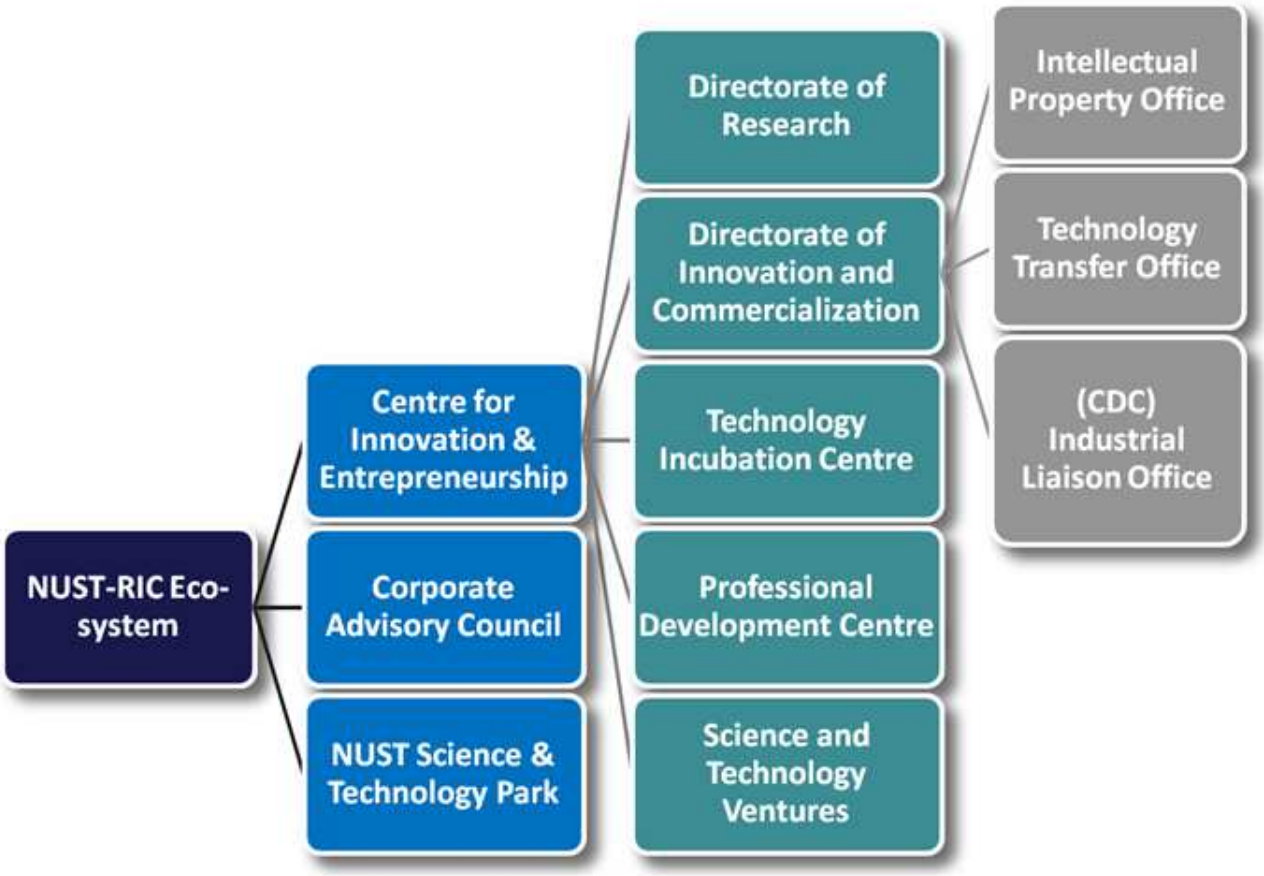
3 National Science and Technology Park

NUST aims to become a hub for public and private technological, financial and human capital through the establishment of a Technology Park at the new campus in Islamabad. The project will encourage knowledge creation at the cutting-edge and develop organizational, human and social capital to compete in the global economy. It looks forward to building networks stretching far beyond major institutions to include entrepreneurs, investors, professionals and underprivileged communities for mentoring and learning.

The Park will promote interaction between institutional elements, i.e., universities, research parks, large companies, venture funds, etc. and non-institutional elements, i.e., talent, bodies of knowledge and virtual communities to create job opportunities for the youth and link local assets to global markets in order to generate value. It aims to stimulate economic activity in the country by developing a unique knowledge-based multi-industry cluster around the capital. Based on the conviction that new research clusters in developing countries will capture an increasing share of global R&D investment and increase the volume added to technology innovations, NUST R&D initiatives will encompass an innovation centre, an R&D centre, a science centre, a technology incubation centre, a manufacturing resource centre and a learning academy that will provide technical and vocational expertise, and entrepreneurship and leadership training. The expansive park will also host a research commercialization centre, university-industry liaison nucleus and event management and recreational facilities. The Park will have a distinctive knowledge brokering facility by means of which it will act as an information intermediary to provide advice on selection of goods or services, business intelligence or research data to interested parties

All of the above organs play a key role in establishing much needed linkages between the industry and academia and therefore bridge gaps between the engagement and action neutral zones; as well as those between industry needs and University research. They help in following a very logical process that ultimately ensures economic benefit. Where some of these organs help in establishing industry linkages, others help in soliciting industry needs through these linkages. Others still, work towards translating these solicited industry needs into academic offerings, both academic and research based. Ultimately, as a last step, some of the above organs then evaluate the resultant need based research for commercialization potential, commercialize it and then offer Intellectual Property Management for the said. In this way, the process of creating knowledge based on current needs, and subsequently transforming the said knowledge into wealth is completed within our eco-system.

NUST RIC ECO-system

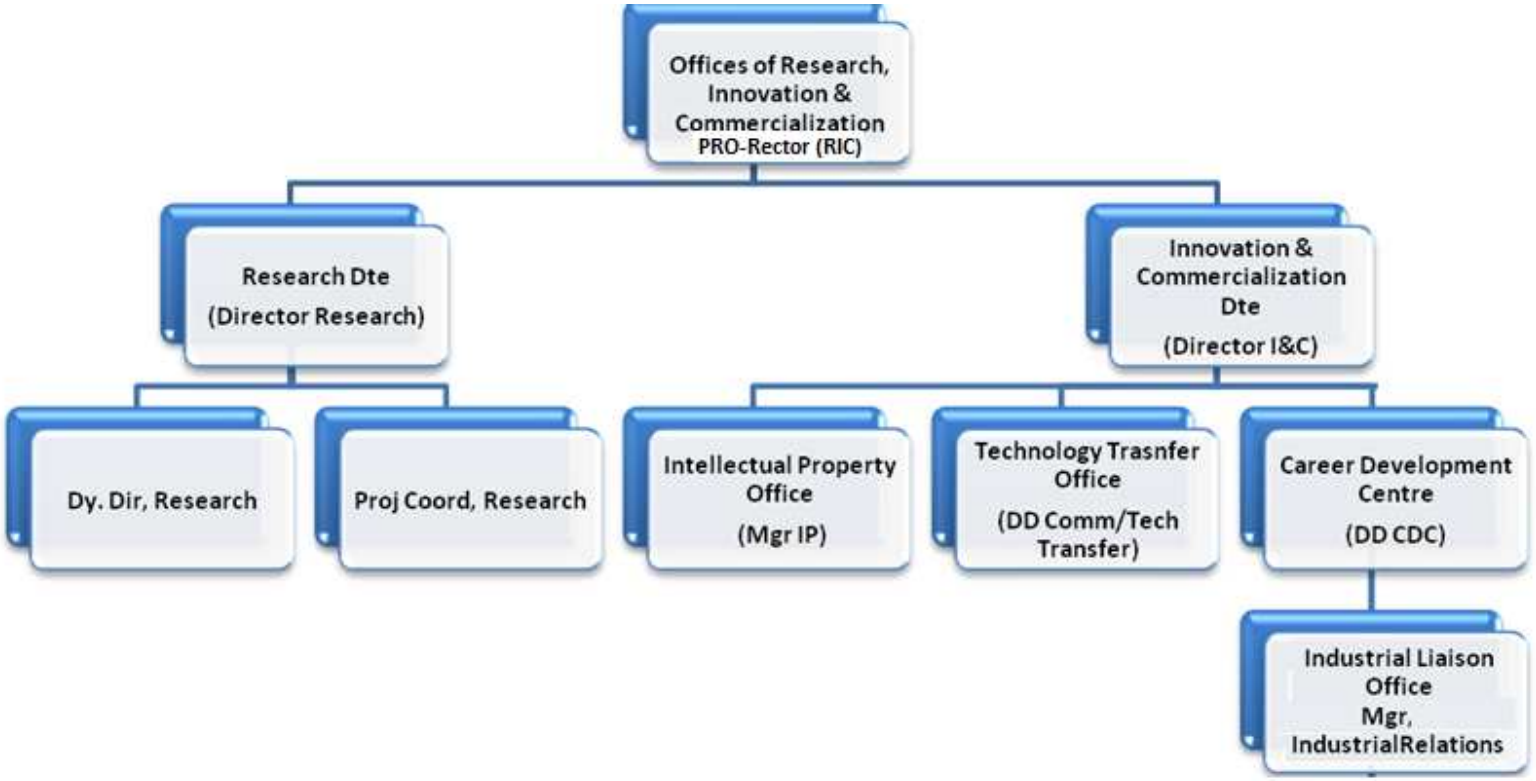


1.3 Structure of ORIC

At present ORIC consists of following entities:

i. Directorate of Research

ii. Directorate of Innovation and Commercialization



Intellectual Property Office (IPO)

The Intellectual Property Management Office determines the patentability of a technology and provides assistance with protection of intellectual property. Intellectual Property system contributes to a strong University economy, encourages investment in innovation, and fosters entrepreneurial spirit leading to new products and services for the competitive global market.

Technology Transfer Office (TTO)

Technology Transfer Office is responsible for moving research results from the laboratory to the market place. It evaluates and manages invention portfolios, gets assistance from IPO in patent prosecution, negotiates licensing agreements and periodically reviews cooperative research agreements already in place.

Career Development Centre (CDC)

CDC provides programmes and services to help students and alumni to explore and make effective career choices, foster professional networks with employers and assist employers in meeting their recruitment needs. The office offers various avenues to the students for personal and professional development and supports them in achieving their goals. CDC also provides valuable means to help employers select professional human resource to fill their job slots by acting as a mediating office for both employers and graduates. The office helps students connect with their potential employers through job fairs and employer sessions. The Industrial Liaison Office is a part of CDC.

Industrial Liaison Office (ILO):

NUST-ILO develops and maintains industry linkages to make NUST graduates their premium choice and identifies specific industry partners for the ongoing research at NUST. It gauges industry needs and processes match making with NUST Institutions to solve industrial problems. This office of CDC has direct bearing on commercialization activities. It currently looks after two areas. These are:

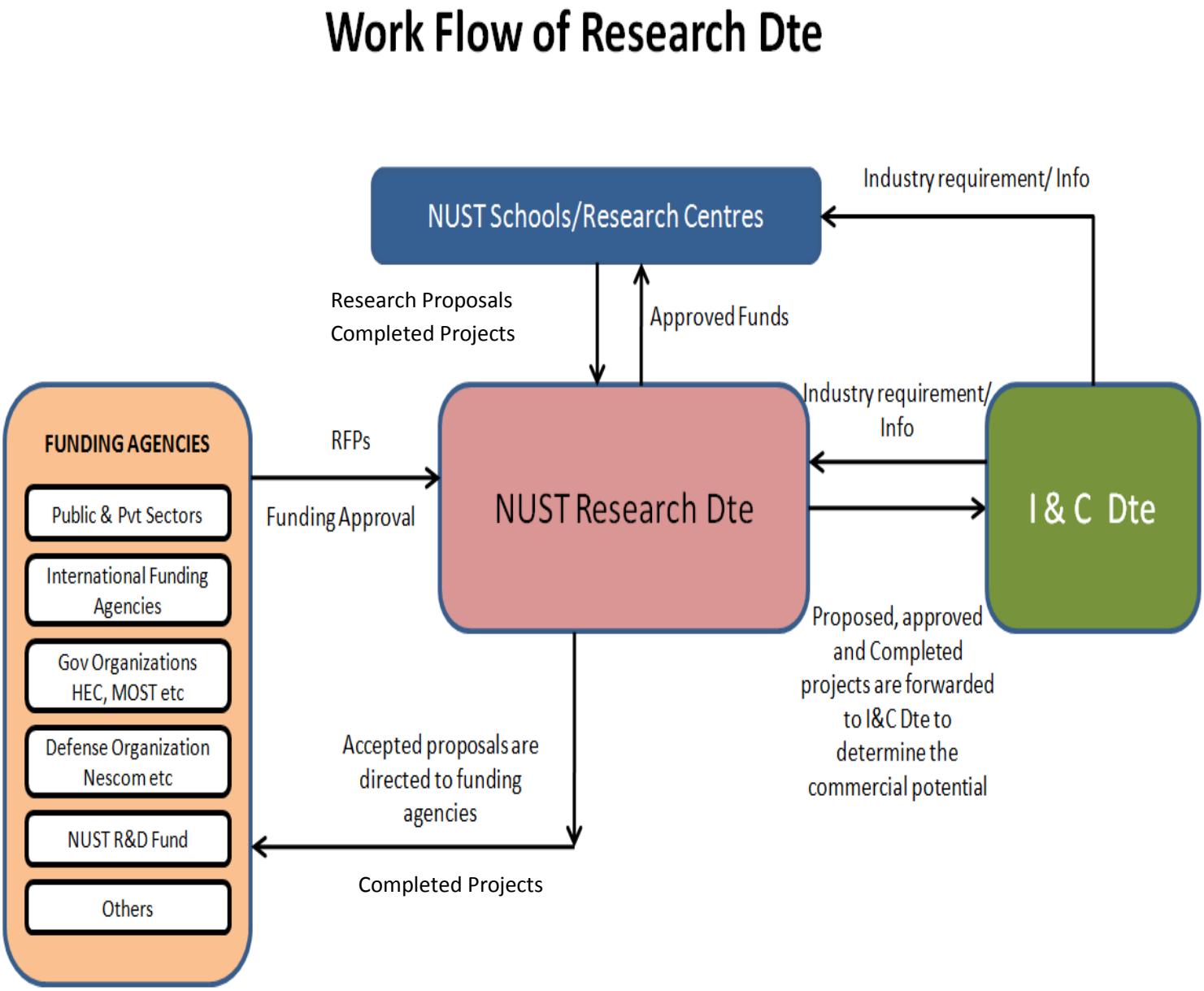
a. Industrial Relations (IR)

The role of IR is to build and maintain strong Academia Industry Linkage with the focus on promoting and making NUST graduates the premium choice for the employers. IR is already fostering professional networks; therefore it also supports TTO to leverage these contacts in finding the potential industrial partners for the research/technologies being developed a NUST for commercialization purposes.

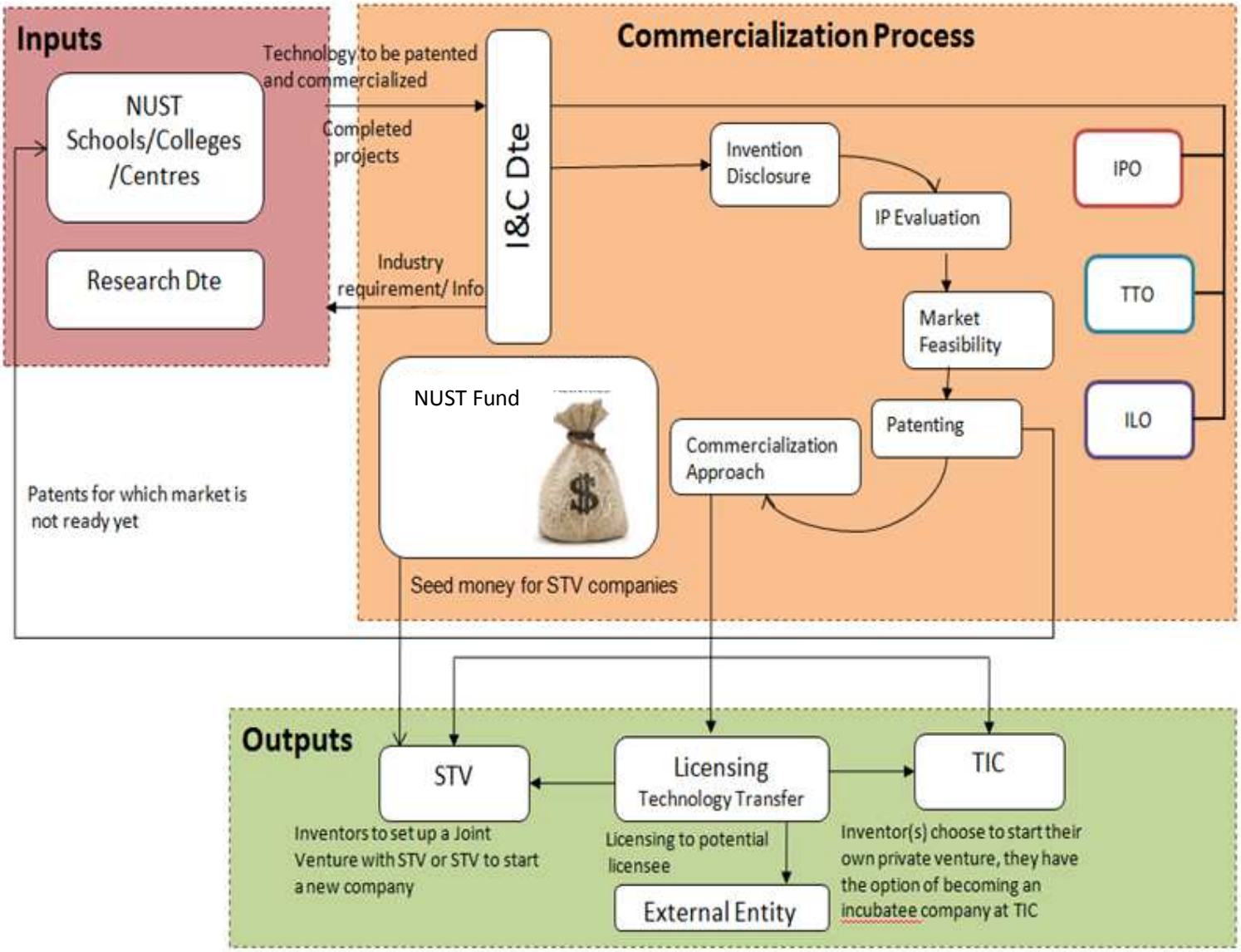
b. Alumni Affairs

The role of this department is to build and maintain lifelong relations with the NUST Alumni through a common platform in order to stimulate interest, build loyalty, increase involvement and generate support for the National University of Sciences and Technology.

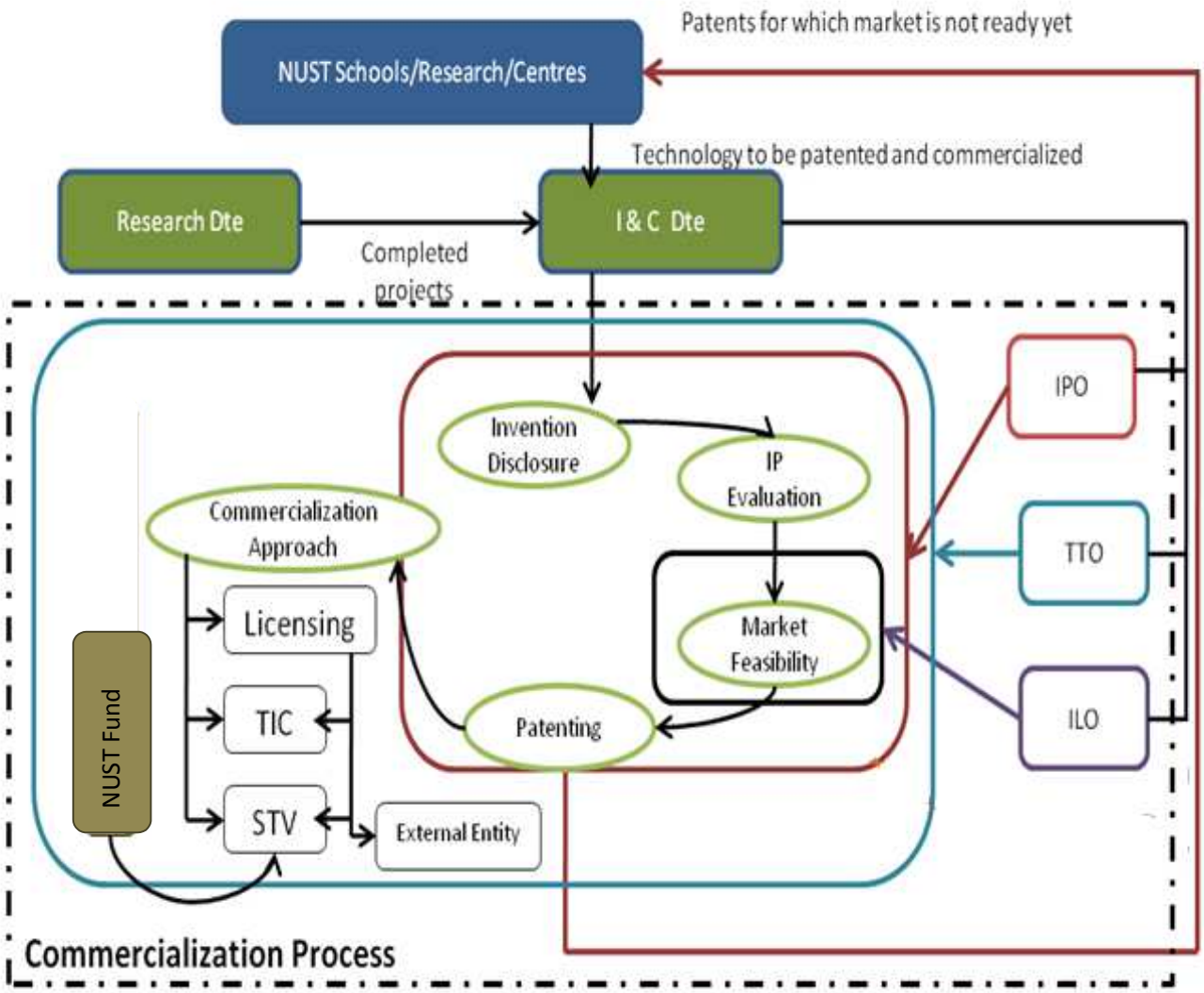
1.4 Process Flow at ORIC



Work Flow of I&C Dte



Roles of Offices at I&C Dte

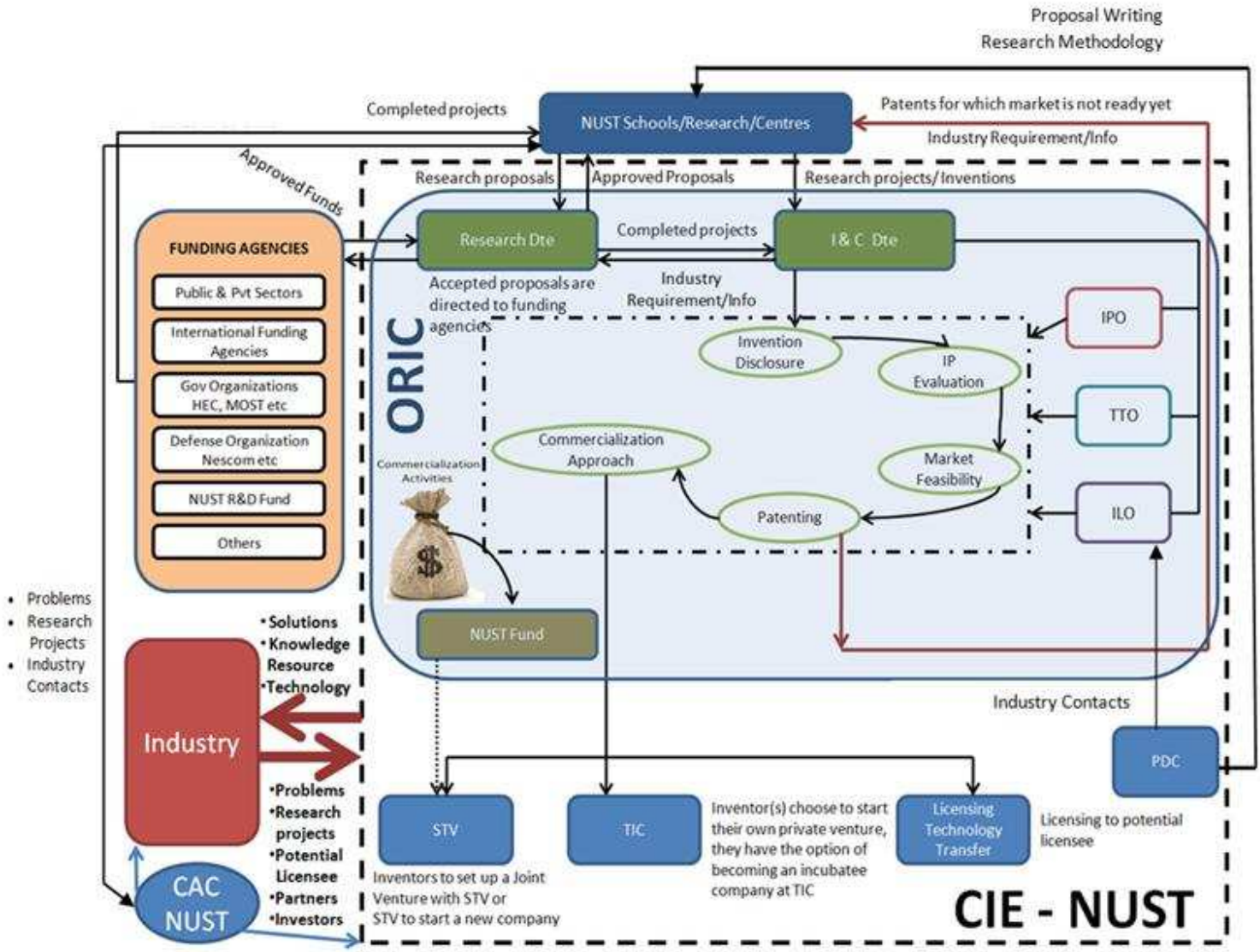


IPO: Performs the IP evaluation and understand the scope of each claim and purpose of the product/technology and analyze the patentability of that technology

TTO: Technology Transfer office is responsible for creating clear processes for the commercialization of technology developed by NUST faculty, researchers and students. Case manager at TTO is involved throughout the commercialization process

ILO supports TTO in determining the commercial potential of the technology and also in seeking potential licensee for the technology (for details see chapter 3)

Consolidated Workflow of ORIC



1.5 ORIC Policies

In order to provide comprehensive services to its stakeholders, ORIC has revised existing policies and developed a set of policies for newly created entities. Significant effort has been made to make these policies fair, efficient, effective, transparent and self-consistent. These policies include:

i. Research and Development Policy
ii. Technology Commercialization Policy
iii. Intellectual Property Rights Policy (already approved by the ECM and available separately)
iv. Policy on the operation and management of Technology Incubation Centre (already approved by the ECM and available separately)
v. Policy on the operation and management of Professional Development Centre (Being processed separately)
vi. Policy on the operation and management of Science and Technology Ventures (Being processed separately)

1.6 RIC Executive Committee

In order to devise and implement strategies with a view to enhance the scope and pace of commercialization of NUST R&D output, an RIC Executive Committee will be formed. The committee will meet as and when required but at least once every 03 months. The composition of committee is as follows:

a. Pro-Rector (RIC) - Chairman
b. Pro-Rector (A) - Member
c. Advisor - Member
d. CFO - Member
e. Dir I&C - Member
f. Dir Research - Member
g. DD Comm/TTO - Secy

CHAPTER 2: RESEARCH & DEVELOPMENT POLICY

2.1 Introduction

In order to develop NUST into a true centre of excellence, it is imperative that apart from maintaining high standards in teaching, research is rigorously pursued and suitably rewarded. The R&D output of NUST is in line with national needs and contributes towards socio-economic growth of the country. The Directorate of Research established at NUST is acting as a focal point for providing guidance and support to the constituent institutions in all activities related to research & development. As such, the Directorate has a significant role to play towards achieving NUST vision. Therefore, the mission of this Directorate is to facilitate and co-ordinate research activities of NUST constituent institutions and to liaise with other national as well as international academics, research and industrial organizations to facilitate research at NUST. Directorate of Research is an integral part of Office of Research, Innovation and Commercialization (ORIC); eco-system, headed by Pro-Rector (RIC).

2.2 Objectives

The Directorate of Research has been established with special focus on the following objectives:

a. To establish a culture so that research remains an integral component of academic activities at NUST.
b. To ensure that high quality research of direct relevance to Pakistan's needs, pertaining to both civil and defence sectors, is pursued in NUST constituent institutions.
c. To facilitate establishment of linkages between NUST constituent institutions and industry both in the public and private sectors and to direct research at NUST so as to cater for local industry requirements.
d. To monitor and co-ordinate research activities within NUST constituent institutions as well as for research jointly undertaken by NUST, Govt. Agencies and Private Sector.
e. Proactively provide information about research funding opportunities to faculty and students.
f. To encourage and assist NUST researchers in obtaining research grants from the Public/Private Sector and Foreign Agencies.
g. Facilitate timely completion of funded research and development projects.
h. Maintain efficient and productive communication channels with funding agencies.
i. To facilitate and support NUST researchers for publication and presentation of their research work through participation in such activities.

2.3 Key stakeholders of Research and Development (R&D) process and policy are:

a. NUST faculty and researchers
b. NUST joint (partner)researchers and developers
c. NUST students
d. Industrial partners
e. National/International Funding agencies
f. Ministry of Science and Technology, Higher Education commission (HEC) and other relevant government entities
g. Offices of Research, Innovation and Commercialization (RIC)

2.4 Key Challenges Expected in Achieving Objectives

2.4.1 Create Balance between Teaching and R&D

The call for more University-Industry collaboration is well grounded amid trends toward intensifying global competition and the drive towards a knowledge-based economy. But these changes should not take place at the expense of the fundamental mission of universities. It remains that universities must pursue several different, conflicting goals. They must still fulfill their primary mission to teach students, and this goal cannot be compromised. Teaching responsibilities, frequent and effective evaluation of students' learning and providing nurturing feedback to students is an extremely tedious and time consuming activity. Faculty members find it challenging to create a balance between their teaching and R&D activities.

2.4.2 Alignment of R&D with Industry's Needs

Industry expects complete and integrated solutions to their key problems which require minimum change in their infrastructure and processes & are available in minimum time. Technologies developed at universities are the brain child of an expert in a particular domain. There is lack of experts who can give industry, the complete integrated solution after analyzing problems faced by industry. Technologies developed at universities are the outcome of some research which most of the times is not aligned with the industrial problems or needs. When such inventions are made, either they do not have market potential at all or they have entered the maturity and decline stage. Succinct information about key problems, bottlenecks and rate limiting factors faced by industry is not available to faculty. Industry and academia often use incompatible terminology which further accentuates the problem. Above all, there is also a lack of confidence between academia and industry in Pakistan.

2.4.3 Information regarding Funding Opportunities

Funding for research and development is available internationally. Faculty members find it challenging to invest time in searching for funding opportunities most suitable for their R&D activities. Very often funding opportunities mandate international collaboration between academic institutions or collaboration with industry. Information related to such collaborations also is not accessible to faculty and researchers easily.

2.4.4 Incentives for Faculty

Research and development activities demand that faculty members maintain deep level of understanding of latest developments in their field of expertise. This is a very time consuming and challenging task. Today's globally connected knowledge based economies are creating knowledge at an unprecedented pace. It is rather convenient to teach courses where the material taught in a class does not change at the same pace from one semester to the other. Faculty needs significant financial as well as career growth incentives to pursue innovation centric research and development. It is important to note that time spent by a faculty member to learn latest development in their field of specialization also significantly improves quality of their course content.

2.4.5 Incentives for Industry

Frequently there is lack of industrial willingness to incorporate indigenous solution in high cost machinery and equipment developed at local universities. Typically the risks involved in incorporating newly developed technology outweigh its benefits, especially when the cost benefit analysis is done based on current sunken infrastructure cost and projected revenue models.

2.4.6 Stretched Funding Process

At times the funding processes for research and development of technology are so stretched out that a research faculty is unable to create a team of researchers in a timely manner. Very often other competing research groups may have solved the problem hence decreasing the importance of proposed research. Time spent on developing the proposal looses its value.

2.4.7 Pool of Experts

We face critical shortage of experienced professionals who are capable of handling complex, multidisciplinary and meticulous work associated with University-Industry collaborations. There is an acute need for personnel with a good deal of business expertise who can handle the administrative and business work associated with University-Industry collaboration and research & development. Such personnel should have an understanding of science & engineering and knowledge of the law. These individuals must also

understand how two different communities, the academic and the business, operate. The challenge is to have the pool of experts from different fields to analyze the diverse technologies and their commercial potential.

2.5 Strategies

a. Support faculty in balancing its responsibility of teaching and industrial problem solving by proactively promoting use of technology.

b. Coordinate development and efficient execution of HR polices that give direct financial benefits, promotions and salary increases based on attracting R&D funding and commercialization of resulting technology.

c. Leverage web technologies, industry links, Corporate Advisory Council, NUST alumni network, funding agencies' websites, focused conferences and workshops and other resources to facilitate collection and dissemination of information related to:

   i. Key national scale problems.

   ii. Local industry's needs.

   iii. Sources of funding for R&D.

d. Provide training, consulting and internal proposal evaluation services to faculty to develop effective proposals. Arrange bridge financing for proposals that go through this process.

e. Create a pool of experts to guide process needed to support implementation of these strategies. Corporate Advisory Council subcommittees can be leveraged to achieve this objective.

f. Encourage and facilitate faculty and students for participation in scholarly activity which leads to interaction, networking and joint ventures for knowledge creation and socio-economic development of country.

2.6 Methodology

2.6.1 Leverage Technology to Support Teaching Activities

It must be realized that teaching and imparting knowledge to students remains the main focus of an academic institution and NUST is no exception. However, what is taught and how it is taught has to be rooted in local socio-economic ecosystem while maintaining international standards. One of the most effective methods to align content of coursework is for faculty to solve local industrial problems and to involve students in such projects. Managing all these activities is challenging for faculty. Through "Policy on Faculty Work Load" issued by Estb/HR Directorate, evaluating of faculty member's workload has already been formalized. Our next challenge is to leverage technology so that faculty can improve their productivity.

Introduction of LMS to manage course content, students' grades and records etc. is very positive and a step in the right direction. One of the most challenging and time consuming activities performed by a faculty

member is evaluation of students' learning and providing nurturing feedback. This task has to be done effectively and frequently. It is time consuming and each student needs individual attention. Proposals to develop technology and content to make student evaluation and feedback effective and efficient will be supported on a higher priority.

2.6.2 Information Flow and Knowledge Management for R&D

In order to solve local industrial problems faculty and researchers need to have access to succinct information about such problems. Industry needs to know faculty's technical capabilities and physical infrastructure available to solve relevant problems. Typically, industry's problems are solved by multidisciplinary teams and appropriate funding sources need to be identified. A state of the art integrated information flow and knowledge management system in the form of "nustinopedia" will be made available to faculty, industry and funding agencies. Resources will be made available to keep data and information consistent and up to-date. Automatic matching of faculty profiles, industry's problems and funding opportunities will be performed. Results of this matching process will be proactively sent to relevant stakeholders. Efforts to arrange workshops, conferences and seminars to collect information regarding national scale problems will be coordinated and supported by research directorate.

2.6.3 Appointment/Responsibilities of HoD Research

In order to further enhance the scope and pace of R&D work, each constituent institution will establish an R&D Cell headed by a Ph.D qualified faculty member to be designated as HoD Research who will co-ordinate, monitor and record all the R&D activities of the institution. The R&D Cell will consist of HoD Research of the institution with ILO assisting him (where exist). Nomination of HoD Research will be sent to Research Directorate which will further liaise with HR Directorate for appointment through office order. HoDs Research at institutes will have following responsibilities:

a. Monitoring of all RIC related activities at respective institutions and reporting to RIC NUST on regular basis.
b. Receiving research project proposals from potential PIs, checking thoroughly as per the requirements/parameters for any mistakes/omissions set by potential donor agency/NUST and dispatch to Research Dte.
c. Follow up of research projects from initiation till logical conclusion and completion report is submitted (closure for the triple constraints of scope, time and cost).
d. Ensure regular submission of project progress reports as depicted in the proposal / project implementation plan to Research Directorate.

e. Ensure that all PIs of projects meet their timelines and in case of resignation or absence of PI for a period, that can affect project outcomes, take over by co-PI as per procedure.

f. Report immediately to Dean/Principal/Commandant of the Institute and Research Directorate for any risk triggering and likely to affect scope, time, cost and any deliverable.

g. Provide reports and returns to ORIC (Research Directorate) in terms of data collection, analysis, presentations and any document or information concerning the research projects/publications/research conferences and all activities being performed under the ambiance of ORIC (Research Directorate) as per the attached format at Appendix 2J.

h. Ensure that all the activities in the Institute falling under the domain of ORIC are executed as per the RIC policy in true letter and spirit. In case of failure Dean/Principal/Commandant and ORIC is informed immediately.

i. Compiling an information pool for all ongoing and completed research in respective Institute and sharing with NUST ORIC whenever requested.

j. Compiling the details of consultants and subject matter experts in respective Institute to share their inputs in evaluation of technologies/products for commercialization.

k. Maintaining and updating data regarding specialist research equipment/lab equipment along with their research capability held with the Institute.

l. Compiling a catalog for all technologies/products with commercial potential and subsequently assisting ORIC to organize presentations with PIs.

m. Continuously update IP data and facilitate researchers to get assistance from IP office NUST.

n. Assisting ORIC NUST in employers' sessions, recruitment drives, counseling sessions and alumni talk series being held at respective Institute.

o. Monitoring industry related collaborations and projects directed towards respective institute through ILO at ORIC.

p. Maintaining database of placements and internship opportunities provided by ORIC.

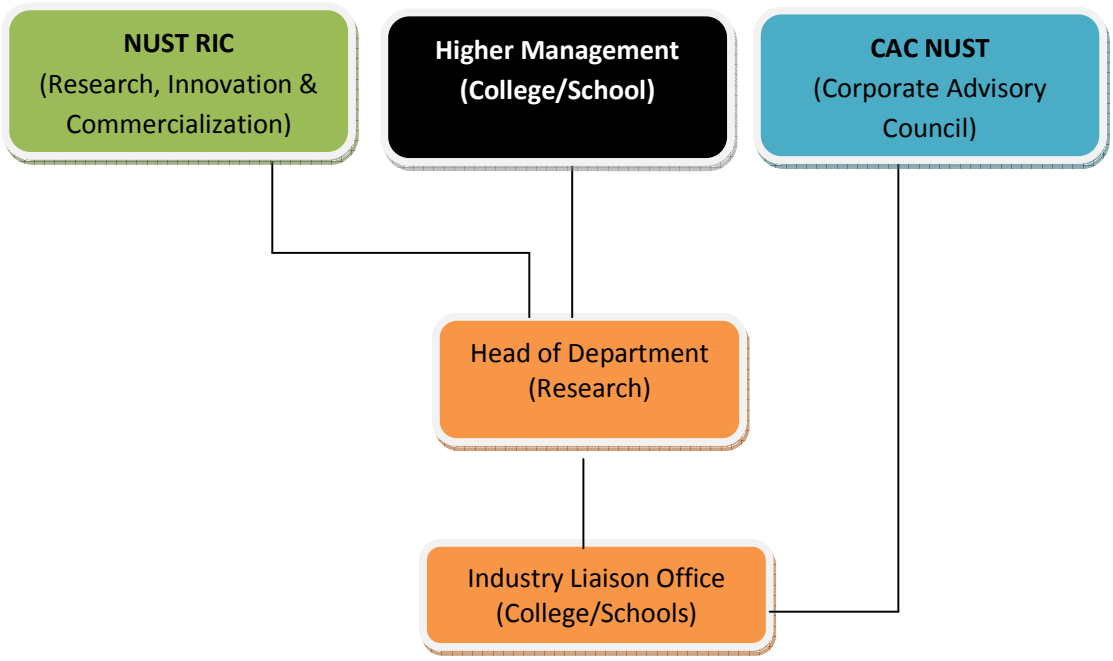
q. Provide regular feedback to I&C Directorate on commercialization activities as required (this includes news items to be published in NUST, MoST , HEC etc. News letters)

r. Provide Reports and Returns to I&C Directorate as per Appendix 2K, 2K1 and 2K2.

s. Creating awareness and training of faculty and relevant staff about RIC related policies and activities.

t. To attend bi-monthly meetings at ORIC to review the progress of ongoing activities.

Organogram



Additionally the institutions will establish research groups/clusters in the areas of their expertise. These research groups/clusters will be monitored both Research Dte and by respective institutions.

2.6.4 Processing of R&D Project Proposals

Broadly speaking, there are following sources of funding for sponsoring R&D projects:

a. Industry including public and private sectors.

b. International funding agencies.

c. Government organizations such as MoST, Ministry of IT & Telecom, HEC, PSF, PTCL, etc.

d. Defence organizations such as NESCOM, MoD and Service HQs etc.

e. NUST Research and Development Fund.

f. Any other funding agency.

2.6.4.1 Raising Project Proposals

A project can be initiated by any member(s) of NUST constituent institutions or Directorates at NUST. The person initiating the project will be called Principal Investigator (PI). It is preferable to have a Co-PI in each project who will assist the PI. In case of a team or group of members initiating a project, there will be a PI and others would be members of his team. Such projects involving a group or team will be preferred especially so if these are multidisciplinary involving more than one NUST institution as this arrangement ensures continuity in progress and reduces dependency on an individual. PI must identify the end- user(s)/beneficiary of the R&D output and also focus on the priority areas, because such proposals have better chances of getting funding/sponsorship. The involvement of industry while raising a proposal also improves chances of obtaining sponsorship. For this, contacts through NUST Corporate Advisory Council (CAC) may be leveraged. PI would also identify the possible sources of funding. The choice of selection of sponsoring agency will depend on the type of the project and areas of interest of sponsoring agencies. Various programmes and areas of interest for all different agencies are available on the respective websites with complete details and the latest version of Request Performas for such proposals. The project proposals will be initiated by PI on prescribed forms of the suggested sponsoring agency. For projects of Armed Services/MoD, the proposals will be raised as per their requirements. In case funding is required from NUST own resources, the proposals are to be raised on "NUST Project Proposal Form", (NUST PPF), attached as Appendix 2A. For projects whose sponsorship is solicited from external agencies a predetermined percentage (15-20%) of the total cost of the project be charged as "University Overheads" to cover the cost incurred by the University. The university Overheads so received is to be disbursed as per para 2.11. It may be noted that while soliciting the funding from external agencies for a project, all HR hiring, traveling, lab equipment cost including inflation and dollar value adjustment, university overheads etc must be catered for.

2.6.4.2 Project Appraisal

The project proposal will be analyzed/scrutinized at Research Directorate, NUST in the light of its requirement/usefulness towards the academic achievements, human resource development, permanent equipment to be inducted, marketing/commercialization aspects and mainly the extent of contribution of the project towards socio-economic growth of the country. The thoroughness with which the proposal is prepared in terms of expenditure, cash plan and timelines with deliverables will also be taken into account.

2.6.4.3 Funding of Projects through External Grants

The project proposal, after necessary vetting at Research Directorate in consultation with I&C Directorate, will be forwarded to the funding agencies/contracting agencies for provision of necessary funds. During the peer review/vetting process of the external funding agencies, if required, representatives of NUST

will attend the meetings along with the PI of the project in order to get the project approval. Directorate of Research in coordination with Project Team would help in finalizing the contract/agreement with the funding agency. Such Contracts/Agreements are to be processed by the Research Dte at NUST and signed by the Pro-Rector (RIC) on behalf of NUST. Sample Contract/Agreement Form is attached as Appendix 2B. However, if the sponsoring agency so requires the contract agreement as per their requirement will take precedence.

2.6.4.4 Funding of Projects through NUST Budget - R&D Fund Account

The R&D Fund Account has been created by pooling 10% of annual tuition fees (income) on regular basis. The intention is to create an Endowment Fund which, over the years, will be sufficient in capital amount to enable R&D projects of NUST constituent institutions to be sponsored/funded out of profit earned. The fund and/or its profit may be utilized for bridge financing large projects or innovative ideas that need low funding. Funding requests for small grants must be submitted using NUST Project Proposal Form. Bridge financing will be provided for projects that:

a. Are submitted to funding agencies.
b. Receive approval for bridge financing from Project Review Committee.
c. Have already received approval from external funding agency and are waiting for funds to be released.
d. To meet any shortfalls for completion of any project if the sponsoring organization is unable to support the project to its logical conclusion. Project Review Committee's Positive recommendation will be needed before funding for completing the project.
e. To fund the R&D projects which require relatively small amounts but have significant application.

The funds from R&D Fund Account can also be used as follows:

a. To provide remuneration/honorarium on the achievements/promotion of R&D activities.
b. Any other aspect which can contribute towards enhancement of scope and pace of R&D at NUST.

2.6.4.5 Project Approval

All R&D project proposals for funding through NUST R&D Fund Account will be considered by the Project Technical Review Committee, consisting of Dir Research as chairman, Dir I&C and DD Comm/TTO as members and DD Research as secretary. If the project is found viable, it will be recommended for approval by the Project Review Committee whose monthly meetings will be held to consider research funding requests to be sponsored through NUST R&D Fund Account. If recommended by the Project Review Committee the funding will be put up for approval by Pro-Rector (RIC)/Rector. The composition of the Project Review Committee will be as under:

a.	Pro-Rector (RIC), NUST	-	President
b.	Director (Research), NUST	-	Member
c.	Director (I&C), NUST	-	Member
d.	Director (Finance), NUST	-	Member
e.	2 x Expert faculty members in relevant fields of the project	-	Member (optional)
f.	01/02 market experts in the respective field	-	Member (optional)
g.	Project Coordinator (Research), NUST	-	Secy

2.6.5 Financial Aspects

R&D projects may be funded in phases or as one time grant only for small expenditures. In case of former the payment will be authorized/released according to phase-wise implementation plan and receipt of satisfactory progress report of previous phase. While NUST encourages its researchers to acquire funding from external resources it also provides fund from its R&D account. It is mandatory for all researchers to understand that funds approved for all sponsored R&D projects are to exclusively be spent on items/heads as approved in the project and the financial rules and regulations promulgated through NUST Statutes be followed for expenditure incurred on the project. However, in case of external funding, requirement of sponsoring agencies will over ride NUST procedures if conflict exists. Subsequent paragraphs are the instructions for administering funds under various sources of sponsoring agencies.

2.6.5.1 Projects Sponsored by Public/Private Sector Industry; Government or International Organizations

Separate account is to be opened for each project and maintained by PI and Accounts Officer NUST. It will be jointly operated by the Commandant/Principal of the institution, NUST Accounts Officer and PI. The expenditure will be incurred in accordance with agreement/contract remaining within provisions of contract/MoU. All requirements/instructions specified by NUST statutes as well as those by the sponsoring agency will be adhered to. In case of a conflict in instructions, the sponsoring agency instructions will be followed. Progress report including an audited financial report for each phase will be sent periodically by the institution to NUST for onward transmission to funding agency as per their requirements. All non consumable items procured will be taken on charge while receipt and consumption record of all consumables will be kept.

2.6.5.2 Projects Sponsored by NUST R&D Fund Account/Development Budget

Each institution will maintain an R&D fund account for each project which will be jointly operated by the Commandant/Principal, NUST Accounts Officer and the PI. The funds made available for R&D activities will be utilized in accordance with provisions given in the project proposal duly prepared by PI and vetted by Research Dte, NUST. All requirements/instructions specified by NUST Statutes and revised from time to time will be followed. All non consumable items procured will be taken on charge while receipt and consumption record of all consumables will be kept.

2.6.5.3 Public/Private Industrial Sector Projects

The NUST researchers will be encouraged and extended official patronage to secure Industry sponsored research project both from Public and Private Sectors. This approach is a two prong strategy: (1) Contributing towards the betterment of socio-economic condition of the country by providing solutions to industrial problems/issues; (2) and generating resource to expand the NUST R&D Fund.

2.7 Monitoring of R&D Projects

R&D Projects will be monitored for their successful implementation as per the Action Plan submitted by the institution. Six monthly progress reports as per Appendix 2C along with audited expenditure report will be sent to Research Dte for scrutiny and/or recommendation for further release of funds. In case of funding by external agencies, six monthly both for progress and expenditure will be submitted to NUST.

Additionally the requirements of the funding agencies for submission and layout of reports must also be adhered to.

2.8 Completion of R&D Project

On completion of a sponsored R&D Project, the project completion report as per Appendix 2D is to be submitted. This report must indicate the objectives/targets as approved in project proposal have been achieved. The report must also clearly indicate the output in terms of inventions/publications/value addition/problem solution/laboratory setup /MS-PhD produced etc. There port must also include a detailed financial report giving expenditure details, duly audited by NUST internal auditors. Any funds not spent are to be returned and all equipment procured through the project is to be brought on charge by the institution where the project was undertaken. For projects sponsored by funding agency other than NUST, the completion report as per the format received by external funding agency must also be submitted. In case the project team is of the view that a project will result in a commercializable output and/or a patent has been generated, the PI must contact Innovation and Commercialization Directorate at NUST for commercialization and/or patenting. Details of the

commercialization and patenting process are given in chapter 3. University/institutional overheads deposited to main office shall be confirmed by the PI in the completion report.

2.9 Commercialization of R&D Output of The Projects

The institutions will forward information about R&D output of the projects of significant importance to I&C Dte, NUST for commercialization. Efforts will be made to commercialize the output of these projects. I&C Dte will play its part in all such commercialization efforts.

2.10 Incentives for Obtaining Sponsored R&D Projects/ Consultancy Services

For academic growth and national development, the faculty members, both military and civilian, are to be encouraged to undertake research projects/studies/consultancy services. Payment of honorarium to the PI will depend on the extent of his/her involvement, total expenditures and net savings from such activities. The distribution of the profit gained after completion of the project/studies/consultancy etc after deducting all expenses on approval by Pro-Rector (RIC) will be as given below. For the projects where an IP is generated the provisions of NUST IP Policy will be followed.

a.	PI & his team	-	80%
b.	Dept/Institution R&D Fund	-	10% (for promotion of R&D)
c.	NUST R&D Fund	-	10%

Commandants/Principals/Deans are to ensure that the faculty members keep appropriate time balance between academic and research activities. Yearly research performance of each faculty member is also to be evaluated based upon his/her number of publications including ISI indexed journal (impact factor) so attained, number of research projects approved by external funding agencies and the funds so acquired. Additionally following incentives will be given:

a. A share in university overheads as per para 2.11
b. Support / sponsorship for membership in specialized societies as per para 2.14.
c. Support for publications in refereed Journals and patent filing as per para 2.15.
d. Sponsorship for presentation of papers in conferences as per para 2.16.
e. Financial award for publication in Journals as per para 2.17.
f. University Best Researcher Award as per para 2.18.
g. An opportunity to the faculty / students to showcase their industry solutions / products are to be evaluated accordingly as per para 3.3.4.
h. University Best Innovation and Commercialization Award.

2.11 Utilization of University Overheads, included in the Externally Funded Projects

HEC provides 15% "University Overheads" in the total cost for all projects under National Research Program for Universities (NRPU), where Offices of Research, Innovation & Commercialization (ORIC) have been established. All NUST institutions are required to add 15% University Overheads when submitting R&D proposals to HEC for NRPU scheme and others as per the provisions of respective funding agencies. As a general guideline researchers are encouraged to add a percentage of University Overheads from 15-20% of the project cost in the total cost of the project proposals.

The amount of the funds received against "University / Institutional Overheads" will be deposited with Finance Directorate Main Office NUST for building the NUST R&D Fund. This fund will be utilized for promotion of RIC related activities at NUST level. In the cases where award letters clearly indicate overhead amounts, the Finance Directorate will retain the overhead amount in R&D account while transferring project funds to the institute and PI. If the overhead amounts are not separately indicated in award letters, the PIs of the projects and institution account officers shall deposit the overheads amount to Finance Directorate on the completion of the project. The confirmation to this effect will be part of the completion report; same is to be verified by Research Directorate. This procedure applies to only those research projects which are provided with University overheads.

2.12 Utilization and Sharing of Research Laboratory Facilities for Academic and Research Purposes

NUST has invested heavily on its research facilities and infrastructure including procurement of a lot of hi- tech lab equipment and expansion and up-gradation of laboratories. This has resulted in enhancement of research capabilities and capacity. As a consequence NUST can claim to have the most comprehensive laboratories compared to other universities in the country. These laboratories are now supposed to become the centre of excellence in their respective fields.

Optimum utilization of our state-of-the-art equipment for benefit by NUST faculty, students and other researchers and also making this available to other organizations/institutions to contribute to the country's development is now the need of the hour. For the purpose, NUST research facilities must be accessible to the researchers/scientific community including NUST TIC Incubatees. The expensive sophisticated, specialized, laboratory equipment purchased by NUST must also be maintained and kept functional, ready to use and upgraded regularly. This translates into expenditure in terms of manpower, spares, consumables, various utilities, services etc. As such there is a need to levy charges upon usage of this sophisticated equipment. Therefore formulation of a methodology to calculate charges, account for the funds so collected and their

disbursal is essential. The purpose is to enable all researchers to have access to NUST state of the art research equipment for utilization for the socio-economic growth of the country and at the same time, to serve as a source of income for maintaining these facilities. This aims to provide a formal, auditable method of self generating funds keeping an account of the same and knowing the authorized disbursal. Guidelines for utilization and sharing of NUST research facilities are as given below:

a. All Research infrastructure at NUST Colleges/Schools/Centres is owned by NUST as a whole and does not belong to any particular project, funding or donor agency/institution/ organization.

b. NUST Institutions will maintain a policy of open access of research facilities and willingly share these facilities with the researchers/scholars.

c. The research facilities will be offered to the researchers and a conducive research environment will be provided to the scientific community/researchers.

d. Only authorized users/researchers will be permitted to use the offered facilities as per the procedure.

e. No facility/equipment will be moved, relocated or rearranged outside the authorized laboratory / institution without prior approval by competent authority.

f. No equipment documentation/associated gears, materials may be removed from its location at any time or for any reason except portable instruments requiring movement for survey purpose which will than be returned.

g. Priority for use will be as follows:

   (i). By the students and faculty of the parent institution.
   (ii). By the faculty and students of other NUST institutions.
   (iii). By any other researcher / organization.

h. Users will be responsible for backing up their own data and protect their own information.

i. The research facilities will not be utilized by any individual user for commercial/business purposes or any profit venture, sub-let etc.

j. The utilization charges, their accounting and dispersal will be done as per provisions of sub para 2.12.1.

k. Laboratory facilities for UG classes within NUST colleges, schools, institutes and centres can be shared / utilized with mutual consent without utilization charges, however, provision of essential consumables and material for project/class will be the responsibility of the Parent Institution where the equipment is kept.

2.12.1 Cost, Accounting & Expenditure Procedure for Utilization and Sharing of Research Laboratory Facilities

The guidelines as given below will be followed for utilization and sharing of research laboratory facilities for academic and research purposes:

a. The costing unit for equipment utilization will be a single test or utilization time (i.e. cost per test or cost per hour).

b. The costing will take into account the following:

(i) Man hours of the supervisor, lab engineer, technician etc. utilized.
(ii) Consumables utilized/utility charges.
(iii) Depreciation / wear and tear of the equipment.
(iv) University over heads at the rate of 50% of the sum of S Nos (i), (ii) & (iii).

c. The charges levied will be as follows:

(i) No charges from the faculty and students of the institution where equipment is placed.

(ii) No charges from UG Class of any NUST institution utilizing the equipment for UG lab experiment as per curriculum.

(iii) All faculty / students of NUST institutions other than where equipment is placed be charged as per calculation of sub para (b)(i) to (iii) (i.e. charges = man hours cost + consumable cost + depreciation / wear cost.

(iv) All other researchers / organizations will be charged as per complete provisions of sub para (b) above. (i.e. charges = man hours cost + consumable cost + depreciation / wear + (university overheads calculated as per sub para b(iv) above.

d. For accounting purposes the following steps be taken:

(i) Separate accounting register be opened for each equipment/machine, use of which is being charged.

(ii) The first page of the register should give detailed cost calculation and rate (per test or per hour).

(iii) The next page onward should give details of funds collected and the dispersal.

e. The funds collected against charges as per sub para b(i)(ii)(iii) above be deposited in parent institution's recurring fund account and be utilized accordingly.

f. The funds collected against charges at sub para (b)(iv) above be forwarded to NUST for depositing in NUST R&D fund account.

2.13 Support for PG Research

Research carried out by Postgraduate students during their MS and PhD programme is a vital and valuable R&D asset of the university. Faculty members are to pay special attention while advising the students regarding the field / topic of research / thesis. The topics and areas of the research should conform to the present as well as future national needs. Financial support will be made available at the start of thesis phase. The fund allocations would be made out of MS thesis and Ph.D research funding held with NUST.

2.14 Support for Faculty Membership in Specialized Technical Journals and Professional Societies

Faculty members can propose any research society (such as ACM, IEEE, CPSR, etc. or other professional societies) that they desire to be a part of, and research journal that they wish to subscribe, for their institution. The university will financially support the provision of these memberships/journals centrally or at institution/department level, if permissible by the publishers, provided that reasonable efforts are made to share the resources among other members of the NUST community. It may however be noted that maximum efforts be made to utilize HEC's PERN facility/Digital Library for consultation of research material.

2.15 Publications in Refereed Journals and Patenting

It is mandatory for the faculty and postgraduate students to publish technical research papers in refereed journals and conferences on regular basis under the name of "National University of Sciences and Technology, Islamabad". Each faculty member is expected to produce atleast one research publication annually in Impact Factor journals. Similarly, each PhD student will contribute at least two research publication in Impact Factor journals. Order of the authors in a publication to be arranged as per their research contribution and students be given preference when publication is based on their hard work. They must also be encouraged to present their research at national/ international forums. Highest credit will be given to publications in journals with high Impact Factor. To encourage faculty for publishing the research finding/paper in ISI Indexed Impact Factor journal, publication/registration fee can be provided. Likewise, sponsorship for publication of book and chapter in a book will be made available after evaluating the research work, publishing agency and standing of the publication. (It is however emphasized that funding for presentation of research papers in conferences as well as their publishing in the journals should be built into the sponsored research projects). In order to elaborate and streamline the sponsorship procedure for publication charges/fee following criterion will be followed:

a. On acceptance of research paper in a journal, case for sponsorship of publication charges/fee may be submitted on prescribed Application Form attached as Appendix 2H at least 04 weeks in advance of the due date for processing and approval.

b. Share of the authors for the sponsorship of publication charges/fee will be determined as appended below:

No of Authors	Order of Authors	Percentage of NUST Sponsorship
Sole	Sole Author	100%
Two	1st Author	60%
	2nd Author	40%
Three	1st Author	50%
	2nd Author	35%
	3rd Author	15%
Four	1st Author	45%
	2nd Author	30%
	3rd Author	15%
	4th Author	10%

c. Only NUST author for full publication charges/fee can be considered on case to case basis for 1st and correspondence author's affiliated with NUST.

d. Publication charges/fee upto maximum of US$ 800/- (or equivalent) for ISI Indexed Journal with Impact Factor and upto maximum US$ 500/- (or equivalent) for Scopus and ISI Master List Journals` research paper can be provided.

e. In order to avoid NUST publications with fake/bogus/predatory publishers and journals, it is mandatory for the authors to carefully select the journal after considering the latest information on the subject.

f. Research work declared clear by the local Research Ethics Committee (where applicable) be only submitted for publication.

Similarly initial filing of all patents will be sponsored by NUST under the following conditions:

a. Patentability of the invention is determined using standard procedure.

b. The assignee of the patent is NUST and at least one of the inventors is a student/faculty member/staff of NUST.

c. Patent is filed with IPO Pakistan.

d. Permission /sponsorship for filing foreign patents is to be taken on case to case basis.

The case for sponsorship of filing of patents is to be processed through NUST Intellectual Property Office.

2.16 NUST Sponsorship of Presentation of Research Paper in International Conferences

For the purpose of sharing and nurturing the seeds of research, NUST organizes and participates in international conferences, seminars and symposiums, etc abroad. These activities foster research and intellectual exchange of information between academia, industry, and other participants. Sponsorship to these events is essential for professional grooming and growth of faculty and students. Eligibility criterion, guidelines and procedure for NUST sponsorship is as follows:

a. A regular faculty member/research staff and bonafide PG student who successfully submits the results of his/her research work in a international refereed conference of repute, will be sponsored on acceptance by the university to present his/her work/paper in that conference.
b. The applicant should have completed six month service at NUST, and has valid contract to continue with NUST. In case of MS/M.Phil student, he/she will only be sponsored for visit to the conference if he/she has already published an ISI indexed(IF) research paper, otherwise, they can request for registration fee only.
c. NUST faculty/research staff/students already abroad on a sponsored program will be considered for registration fee on case to case basis only.
d. The standing of the conference will be determined by the acceptance i.e acceptance of full length paper and peer review etc. process. If the acceptance of papers is without a peer review and/or on submission of abstract only and for poster presentation, the request for sponsorship will not be entertained. The quality of the research paper and conference will be evaluated on the basis of following:

    i. Maturity level of the conference.
    ii. Acceptance rate (if available).
    iii. Hosting Agency/Organizers/Event body/Professional Society.
    iv. Review process and reviewer's comments.
    v. Indexing of the proceedings.
    vi. Value of research work/paper and expected benefits viz-a-viz cost involved.
    vii. Possibility of publication of extended/modified version paper in a valued journal

e. In case of multi-authored papers the travel request to present paper will only be applicable for the first author unless the first author is not eligible or unable to present due to exceptional circumstances beyond his/her control. In such case, supervisor of the 1st author can be sponsored for presentation in the conference for the research paper to be published in proceedings.

f. The Commandant/Principal of the institution is to ensure that only those requests are recommended for sponsorship which have high value and have strong chances of getting the revised/modified research paper published in a reputed refereed journal. The request for sponsoring visit/registration fee in a conference is to be submitted on prescribed form, attached as Appendix 2E.

g. Faculty member/research staff/PG student may request for sponsoring of the registration fee only for subsequent paper(s) to be published in the proceedings of refereed international conference(s).

h. Primary professional affiliation of the author with NUST and acknowledgement of sponsorship must be shown on the research paper

i. NUST sponsorship will depends upon availability of funds in the relevant head and approval of the Competent Financial Authority.

j. All such requests must be forwarded to Research Dte, Main Office NUST at least 08 weeks in advance for processing and approval. The request must also have the duly filled application forms (as applicable) for alternate sources of funding like HEC, PSF, PTCL and Ministry of IT etc.

k. All participants are required to submit the conference proceedings/Post Visit report to the institution and the institution will forward it to Research Dte.

l. Request for second time sponsored visit to a conference would only be entertained, if subsequent to the conference, a research paper is published in ISI indexed journal with Impact Factor and one year has been passed from the date of previous conference sponsorship.

m. PhD student will be required to produce at least two ISI Indexed (IF) research papers before the 2nd sponsorship.

n. Sponsorship for Conferences held within country will be approved by the institutional heads out of institutions` budget.

2.17 Grant of Financial Award for Publication

NUST has always encouraged its faculty, research staff and students to actively involve themselves in research activities. It has been forthcoming in providing financial support and sponsoring the research activities. In this context, encouragement for research publications remains a very important aspect of NUST policy. NUST will also provide cash awards up to Rs.50,000/- for contribution of its faculty, research staff and students in publication of their research work with NUST affiliation. The request is to be submitted as per prescribed form attached as Appendix 2F. It is a well known fact that the quality of research publications is judged by the Impact Factor of the journal in which these are published, therefore, in order to further improve the quality of our research publications and align the policy with the latest trends, the following is necessary:

a. Research publication under the name of "National University of Sciences and Technology (NUST), Islamabad, Pakistan" will only be considered for the award under the policy.

b. Authors with NUST professional affiliation will only be considered for the award.

c. Maximum of the first four authors in the order will be considered for the award in a multi-authored research paper.

d. Impact Factor (IF) journal indexed with Institute of Scientific Information (ISI) will be given much higher weightage for the financial award. The ISI official website has several subject categories. The amount of award of the paper will be calculated according to the rank of the journal in the relevant ISI subject category, with respect to Impact Factor in which the paper has been published. For this category, the financial award range is between Rs. 30,000/- to Rs.50,000/-. The amount to be calculated as follows:

Amount of the award in Rs. = $30000 + (20000) \times \frac{TJ - PJ}{TJ - 1}$

TJ = Total journals in relevant ISI subject category

PJ = Position of the journal in descending order with respect to impact factor in the subject category

e. Research paper published in internationally recognized journals (bearing ISSN, international authorship, editorial board/peer review panel and distribution) which are not indexed with ISI will be given award upto maximum Rs. 10,000/-.

f. While single author papers will be given amount as per sub para 'd' & 'e'. In case of multi-authored paper, share of the award will be distributed amongst authors as follows:

No of Authors	**Order of Authors**	**Percentage of Share**
Two	1st Author	60%
	2nd Author	40%
Three	1st Author	50%
	2nd Author	35%
	3rd Author	15%
Four	1st Author	45%
	2nd Author	30%
	3rd Author	15%
	4th Author	10%

g. A book or chapter published in a book will be processed under this policy on case to case basis giving due consideration to the recommendations and justifications by the institution.

h. PhD Thesis published in the form of a book will not be considered under the policy.

i. A text book published for higher education and disciplines taught at NUST will be given higher preference.

j. Research work published in a journal which is not a full-length research paper i.e. Letter to Editor, Abstracts, Notes, Short Paper/Study, Discussion & Comments, Erratum and Corrigendum etc. will be considered for the award on case to case basis. Such research work will not be counted for promotion.

k. Research paper published in ISI Master List, Scopus and NUST Journals will be given award upto maximum of Rs.20,000/-.

l. Likewise, the Editor of NUST Journal will be given an honorarium of Rs. 50,000/- per issue of the journal.

2.18 University Best Researcher Award

In order to encourage young researchers and to motivate them to perform better in future, University Best Researcher and institute-wise Best Researcher of the year Award will be given on Postgraduate and Undergraduate Convocations. The Best Researcher Award for the year will be based on a calendar year performance. It will be consist of a certificate of recognition from the Rector NUST along with a cash prize of Rs.150,000/- for University Best Researcher and Rs.75,000/- for Institution Best Researcher. Following procedure for selection will be adopted:-

a. Each institution will recommend one candidate on the prescribed proforma attached as Appendix 2G along with supporting documents through respective Commandant/ Principal.

b. Final selection/approval of the University Best Researcher shall be made by Rector NUST based on the recommendation of NUST Evaluation Committee (NEC) consisting of the following:

i.	Pro-Rector (Acad)	-	President
ii.	Registrar	-	Member
iii.	Director (Research)	-	Member
iv.	Director (I&C)	-	Member
v.	Director (Acad)	-	Member
vi.	Director (QA)	-	Member
vii.	Director HR	-	Member

c. Institution's Best Researcher selection will be carried out in line with criterion of Working Paper No. 30 approved in 40th Academic Council Meeting (ACM) held on 10 Jan 2014 .

d. Eligibility criteria for University Best Researcher nomination will be:

i. The researcher must hold a regular "faculty position" at NUST.
ii. Commandants/Principals and Deans of the institutions will not be eligible.
iii. Minimum two years service in NUST is essential.
iv. Faculty member with age less than 40 years.
v. Once awarded, re-nomination shall be considered after five years.
vi. Data for the calendar year under consideration will only be applicable.
vii. A claim with insufficient documentary proof will not be considered for points` calculation.
viii. Research projects processed through or intimated to Research Dte with proof of funds released to NUST will only be counted.

ix. Publications, projects, research grants, patents, student supervision etc. related to NUST will only be considered.

x. The best researcher must have some scores in at least 04 categories of the submitted proforma and winning aggregate score of the nomination should not be less than 25% for the award.

xi. University Best Researcher Award and Best Innovation & Commercialization Award should not be awarded to a faculty member in the same year.

2.19 Faculty Research Performance Evaluation

All NUST institutions will evaluate annual research performance of its faculty in accordance with Criterion of Performance Evaluation of Faculty issued by HR Directorate, NUST.

2.20 Research Assistants (Scholarships/Stipends)

Research Assistant (RA) is the core of research work at any educational institute. Research grants for hiring part-time research assistants may be obtained by faculty members, out of the funds allocated through sponsored R&D projects being handled by them. NUST may also consider the request for an RA depending upon the research work and teaching workload undertaken by the faculty member.

2.21 Conferences/Workshops/Seminars at Institutions

Each constituent institution of NUST is required to organize at least one national level conference/ workshop/ seminar each year and at least one international level conference/workshop/seminar every alternate year in their respective field of disciplines. During the event, in addition to concerned scholars representatives from various concerned industries, ministries and Services HQs may be invited to attend. Apart from detailed briefing about the institution, the students/faculty members may be given time for presentation of their research work. The participants should also be shown the research work in the area and may be taken around the Labs and Library facilities highlighting the strength of R&D work. The objective is to enhance our rapport with the industry by developing understanding and strengthening industrial linkages and in the process, secure internships/placements for our students as well as sponsored research projects and consultancy services. The grant, on as required basis, to accomplish specific research objectives such as seminars, conferences, training, or to publish awareness building or educational materials be solicited from sponsoring agencies like HEC, PSF etc and in case of additional requirements funds can be provided from NUST Budget.

2.22 Research Ethics and Avoidance of Plagiarism

Higher Education Commission (HEC) has formulated a "Plagiarism Policy", which aims to apprise the students, teachers, researchers and staff about plagiarism and how it can be avoided. HEC Plagiarism Policy is available at HEC website: www.hec.gov.pk/QualityAssurance/download/Plagiarism Policy.pdf. In order to guard against plagiarism in university produced scholarly works and to improve the quality of research, HEC has also purchased anti-plagiarism software "Turnitin" and provided its accounts to Universities. As per the policy on plagiarism, all NUST publications submitted for any conference/journal or published independently as theses, research articles and assignments are to be evaluated for plagiarism using "Turnitin" Software. NUST institutions at all level (i.e. Principal/Commandant/Head of Department/Dean/Supervisor/Faculty Member) must ensure that publications or any written materials presented (i.e. reports, papers, thesis, assignment etc) by our Faculty/Students are free from the plagiarism. It is imperative that the cut-paste culture does not take roots in the scholarly works of the University. All must actively guard against such practices and advise others to refrain from the same. All faculty members must open their accounts on "Turnitin" and use software to check all publications. A copy of verified originality report checked through "Turnitin" is to be attached with publications (both conference & journal) whenever these are sent to NUST. Also in case of publications directly submitted for conference/journal publication these reports be verified by school/college authorities. Vigilance on the part of NUST Faculty is necessary to eradicate plagiarism and maintain the good name of the university. NUST has formulated "Standing Committee on Plagiarism and Research Ethics". The committee will deal with the misconduct cases at the university level in accordance with HEC/University Plagiarism Policies, and code of conduct. In case of absence of local rules/regulations on plagiarism, research ethics and guidelines from best international practices will be considered for resolving the issues and decision making.

2.23 Publication and Secrecy

It is the university policy to support research and the researchers to publish and materialize research results. Researchers shall however not enter into projects requiring secrecy without the specific permission of the Dean/Principal/Commandant. During implementation of the R&D project, if any confidential information has been made available to the investigator/ researcher, the confidentiality of such information is to be protected. For this, the person furnishing such information may require submission of any manuscript for review of comments after deletion of specific items constituting disclosure of such confidential information.

2.24 Associating as Adjunct Faculty with NUST

Interdisciplinary and collaboration have become synonymous with all things progressive about research and education, because of the scientific complexity of problems currently under study. It is therefore desirable that our scientists/researchers gravitate toward the rich scientific opportunities at disciplinary boundaries across the organizations. To facilitate researchers, NUST is now offering its platform to dynamic individuals for contribution and collaboration in research. The researchers at various R&D organizations can associate as Adjunct Faculty with NUST as per the procedure. Under this collaboration, these researchers can get the status of Adjunct Faculty and may be offered following benefits under the umbrella of NUST:

a. Combined authorship in research publications with NUST Faculty and supervision of PG Students.
b. Usage of NUST research facilities and labs as Adjunct Faculty Member for collaborative research projects.
c. Payment of publication fee for research paper published with affiliation of NUST in ISI Indexed Journals.
d. Entitlement for Publication Award for the author at par with NUST faculty.

Appendix 2A

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851218 Fax: (051) 90851202

E-mail: rprojects@nust.edu.pk

PROJECT PROPOSAL FORM (NUST PPF)

1. Name of College / Institute / Center:

2. Project Title:

a. **Principal Investigator (PI):-**

(1) Name:
(2) Designation:
(3) Organization:
(4) Mobile No:
(5) Telephone No:
(6) Email Address:

b. **Co-Principal Investigator (Co-PI):-**

(1) Name:
(2) Designation:
(3) Organization:
(4) Mobile No:
(5) Telephone No:
(6) Email Address:

c. **Contact Person:-**

(1) Name:
(2) Designation:
(3) Organization:
(4) Mobile No:
(5) Telephone No:
(6) Email Address:

3. Collaborating Organizations

a. Industrial Organizations:-

Name	Role / Contribution

b. Academic Organizations:-

Name	Role / Contribution

c. Funding Organizations:-

Name	Role / Contribution

d. Other Organizations:-

Name	Role / Contribution

4. Keywords

(Provide maximum five words that describe the project)

5. Status of the Project (Tick the relevant from the following).

a. New
b. Extension of existing project (write title of previous project)
c. Modification of previous project (write title of previous project)

6. Project URL

The project URL should be provided. This URL should be hosted by the project executing agency. Sufficient details such as execution summary, objectives are expected on the website. Once the project proposal is approved, the website should also provide final copy of the proposal and deliverables / progress.

7. Project Duration

a. **Expected starting time:**
b. **Planned Duration:**

8. Executive Summary of the Project

9. Scope, Introduction & Background of the project:-

a. **Scope**
b. **Introduction**
c. **Challenges**

10. Objectives of the project:-

a. **Specific Objectives**
b. **Research Objectives**
c. **Academic Objectives**
d. **Industrial Objectives**
e. **Human Resource Development Objectives**
f. **Other Objectives** (if any)

11. Research Approach:-

a. Development / Research Methodology
b. Project Team
c. Team Structure
d. Project Activities
e. Key Milestone / Deliverables

12. Benefits of the Project:-

a. Direct Beneficiaries of the project
b. Outputs Expected from the project
c. Organizational / HRD outcomes expected
d. Technology transfer / Diffusion Approach

13. Risk Analysis

a. **Risks of the project** (Tick the relevant box)

		L	M	H
(1)	Technology Risk	☐	☐	☐
(2)	Timing Risk	☐	☐	☐
(3)	Budget Risk	☐	☐	☐

b. **Comments** (Any essential comments that are necessary from project point of view).

14. Contractual Matters

a. **Contractual obligations under the project** (Concerning third party)
b. **Ownership of Intellectual Property Rights**
c. **Competent Authority of the PI's organization**

(1) Name:_____
(2) Designation: _____
(3) Email:_____
(4) Date:_____

_____

(Signature & Stamp of Commandant / Head of Institution)

Surety Certificate

Title of the Project: _____

_____

PI:_____ **Co PI:_____**

Funding Agency:_____ **Amount:_____**

It is certified that the proposal has been scrutinized for following:-

(a) Targets set by the PI are attainable / reasonable.

(b) Track record of PI is sound and qualification adequate.

(c) The PI has shown commitment to complete the project if awarded.

(d) He has been informed that he will be responsible to transfer the project in accordance with rules / regulations in case he leaves the institution or desires to proceed on course / long leave.

Signature of PI **Head of Institution**

Appendix 2B

CONTRACT FOR FINANCIAL ASSISTANCE UNDER RESEARCH GRANT

(SAMPLE)

Whereas the Higher Education Commission, subsequently referred to as the "Commission has agreed to grant a financial assistance to _____ subsequently referred to as the "Party" for the project entitled "_____" subsequently referred to as the "Project".

Now it is mutually agreed as follows:

1. The financial assistance will be for a total amount of Rs. _____spread over a period of _____.
2. The assistance will be given to the Party in one installment as shown below:

1st Installment	Rs._____
2nd Installment	Rs._____
3rd Installment	Rs._____

3. 3 Progress report will an expenditure statement (3 copies) will be submitted by the Party to the Commission in accordance with instruction issued by the Commission to the Party from time to time.
4. The Commission shall have the right to evaluate the progress of research/investigation/work done by the Party through a evaluation Committee to be appointed by the Commission for this purpose. This evaluation will include on-site inspections also.
5. The grant received by the Party form the Commission will be exclusively utilized for the project and the party will submit a audited statement of expenditure alongwith the annual progress report.
6. The expenditure incurred from the grant will also be subject to periodical audit by the Commission and the Party shall produce the books of accounts to the persons(s) appointed for this purpose by the Commission.
7. All purchase will be made as per prescribed rules of the Government/University where the project is located.
8. Machines, equipment, apparatus of any other thing purchased out of the grant given by the Commission will remain the property of the Commission, or with the permission of theCommission, the University where the project is located.

9. Any discovery made, patent and/or license obtained based on the research carried out with this grant will be in the name of the Commission and any income accruing there from, will be shared by the Commission and the Party according to the formula to be stabled by the Commission.
10. The Party shall spend funds strictly in accordance with the approved plan. Any deviation in this regard shall require the prior approval of the commission.
11. No change in the arrangement for supervision/execution of the project or in the approved technical programme will be made without the written consent of the Commission.
12. In all publication and reports concerning the project, the supported provided by the Commission will be duly acknowledged.
13. The project funds shall be maintained in separate account to be operated jointly by the Party & Treasurer/Accounts Officer (in case of Centres) and all payments will be made observing all codal formalities.
14. The party shall carry out necessary revisions/amendments as suggested by evaluator(s) before execution of the project.
15. If PI intend to go abroad, he/she should inform R&D Division of HEC prior the departure and may nominate substitute for the period of his/her absence with a plan of activities of project to be carried out in his absence by the nominee.

In witness hereof, I/we _____put my/our signature(s) here below on the _____day of _____.

Signature
Higher Education Commission

Signature of the Party
Name: _____

1. Designation:_____

   Dated:_____

2. Signature of the Principal/Commandant of School/College

3. Signature of the Vice-Chancellor/

   Institutional Head/Official Stamp

   Dated: _____

Appendix 2C

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851218 Fax: (051) 90851202

E-mail: rprojects@nust.edu.pk

Six Monthly Progress Report

1.	**Name of Project:** Date of Approval: Date of Commencement: Date of Completion: Duration :			
2.	**Financial Status:** Amount Released: Amount Expended: Amount in Balance			
3.	**Present Status:**	In Progress	Delayed	Completed
	Progress Status achieved during the reporting period			

	Activity (Same as the implementation plan)	**Target date of completion as per implementation plan**	**Achieved %age**	**Remarks**
a.				
b.				
c.				
4.	**Issues/Bottlenecks in Projects Implementation, if any:**			
	Signature of the PI			
	Date:_____			

Countersigned by HoD (Research)

Appendix 2D

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851218 Fax: (051) 90851202

E-mail: rprojects@nust.edu.pk

PROJECT COMPLETION REPORT

To be furnished immediately after completion of Project

1.	**Title of Project:** **Project No.** (in case of HEC)	
2	**Project Information** Date of Approval: Date of Commencement: Date of Completion: Approved Duration:	
3.	**Project Budget** Approved Amount Amount Received: Amount Expended: Amount in Balance:	
4.	Funding Agency and Scheme	
5.	**Information of Principal Investigator** Name: Email: Cell#: Tel (Office): Institution:	
6.	**Information of Co-PI** Name: Email: Cell#: Tel (Office): Institution:	
7.	**Information of Other Team Members** Name Email: Cell#: Tel (Office): Institution:	

8. **Lab Equipment and others items purchased for the project:**

S. No	Items	Cost	Make/Model/ S.No	Name of Lab where item/eqpt physically available	Voucher No.

9. **Project Details:**

a. Introduction
b. Summary of research Methodology
c. Objectives of the project
d. Capability achieved

10. **Benefits of the Project:**

a. Market Potential
b. End Users/Organizations which can utilize output.
c. Marketing / Commercialization Strategy
d. A certificate to be furnished that following objectives of project as per proposal have been achieved:

11. **Tangible Outputs of the project**

a. Details of research papers produced.
b. Details of conferences/workshops/seminars conducted.
c. Details of product invented through this project.
d. Is it Lab Model, Software or Prototype?
e. Details of Patent Filed or otherwise.
f. Any kind of lab has been established while completing this project?

12. **Research Supervised** (Number of students who have **completed** research degrees under said project)

PhD produced	M.S / MPhil Produced	Total

13. **Research Assistants (RAs) Hired**

S. No	Name	Salary	Duration	Total Cost
a.				
b.				
c.				
Total				

14. **Research Visits (Foreign) under the Project Fund**

Name of FM/Student	Visit Country	Expenditure	Visit Duration	Visit Univ/Dept/Org etc

15. **Other Outputs**

No. of Products		**No. of Processes/ Methods**		**Any other out put Please specify**	
Developed	**Marketed**	**Developed**	**Marketed**	**Developed**	**Marketed**

16. **Linkages with R&D Organizations, Universities and Industries:**

S. No	**Counterpart organization**	**Type of linkage**

17. **Socio-Economic Impact of the Project (Compulsory).**
18. **Reasons of delay if the project is completed after the approved duration:**
19. **Recommendations on further utilization of results / output indicating commercialization and marketing:**
20. **Major problems faced during the execution of project, if any:-**

Signature of the Principal Investigator : _____

Name of the Principal Investigator : _____

Date of Completion : _____

Date of Signature : _____

Signature of HoD (Research) : _____

Countersigned by Commandant / Principal

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851218 Fax: (051) 90851202

E-mail: rprojects@nust.edu.pk

FUND UTILIZATION REPORT

Project Title:

S. No	Description	Approved Budget	Expenditures	Balance
a.	Salaries (Including Honorarium)			
b.	Permanent Equipment			
c.	Expendable Supplies			
d.	Literature, Documentation			
e.	Travel / Research & Training			
f.	Miscellaneous			
g.	Indirect Cost (University Overheads)			
h.	Others			
	Total			

Principal Investigator: _____
(sign & stamp)

Accounts Officer: _____
(sign & stamp)

University Audit Authority: _____
(sign & stamp)

COUNTERSIGNED

Commandant / Principal / Dean / HoD Research
(Signature & Stamp)

Appendix 2E

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851205 Fax: (051) 90851202

E-mail: dresearch@nust.edu.pk

CHECK LIST FOR ORAL PRESENTATION OF RESEARCH PAPER IN INTERNATIONAL CONFERENCE/SEMINAR/WORKSHOP/SYMPOSIUM ETC

Please attach copies of relevant documents/correspondences and tick the relevant box.

1.	Sponsorship case has been prepared on revised NUST, HEC and PSF Application Forms.	
2.	Full length Camera Ready Research paper under full nomenclature of "National University of Sciences and Technology, Islamabad, Pakistan" is attached.	
3.	Duly verified "Originality Report", of the research paper/work to be presented, generated through "Turnitin" is attached.	
4.	Acceptance as "oral presentation" after peer review of full paper in the respective conference.(original preferred; photocopy must be attested by Head of Department or Dean	
5.	Reviewers comments on the quality of the research paper provided by the conference organizers is attached.	
6.	In case of already fully sponsored, copy of published research paper in ISI Indexed (IF) journal has been attached with the case	
7.	Attached conference brochure containing aims, objectives and themes with schedule of charges of registration fee and accommodation etc.	
8.	Attached Economy class airfare certificate by the shortest route.	
9.	In case of co-author, please attach NOC from preceding author(s).	
10.	Brief CV (2-3 pages) including research contribution and S&T achievements	
11.	Duly filled in revised HEC and PSF sponsorship application forms, which can be downloaded from their respective websites; www.hec.gov.pk & www.psf.gov.pk alongwith requisite documents i.e. airfare invoice, complete papers, conference information and CV are to be submitted for onward submission to HEC & PSF.	

(Complete application should be received at least 08 weeks before the conference date at NUST. Late or incomplete applications will not be entertained.)

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851213 Fax: (051) 90851202

E-mail: research@nust.edu.pk

APPLICATION FORM FOR SPONSORSHIP OF PRESENTATION OF RESEARCH WORK/PAPER IN REPUTED INTERNATIONAL REFEREED CONFERENCES/ SEMINARS/WORKSHOPS

(Note: The case is to be submitted to NUST at least 08 weeks in advance for processing and approval)

1. Applicant's Profile:

Name:
Registration No. /Date of Joining
NIC #
Highest qualification
Designation
Institution
E-mail
Mobile #
Details of Previous Sponsorship for Conference by NUST/HEC/other funding agencies

2. Title of Research Work/Paper:

(Please attaché the copy of Research Work/Paper)

3. Authors Details:

1st Author Name
Designation (UG /MS/M.Phil /PhD Scholar/ Faculty Member/Research Staff)
Organization

2nd Author Name
Designation (UG /MS/M.Phil /PhD Scholar/ Faculty Member/Research Staff)
Organization

(To be continued depending upon number of authors)

4. Conference Title:

5. Main Theme of the conference:

6. Conference Hosting Agencies:

7. Conference Hosting Agencies

8. Acceptance Rate of the Conference:

9. Venue of Conference:

10. **Details of invitation and acceptance by the organisers**:

(Attach on separate sheet and refer here)

11. **Website/E-mail of Conference/Organisers:**

12. Requirement of finances (attach supporting documents) Total:

a. Airfare with Invoice :
b. Registration Fee :
c. Visa Fee:
d. *Others Expenditures :*

13. Details of sponsorship/funding by organisers/other agencies:

14. It is certified that: (To be answered in Yes or No)

a. Research work to be presented is original.
b. Contribution of full length research paper by a researcher is accepted only after a blind peer review or review by editorial board having substantial academic repute.
c. The hosting agency of conference (i.e. academic institution, professional society or industry) is of considerable repute.
d. The subject of the conference is pertaining to the disciplines, which are related to specialties covered by NUST.
e. The hosting agency of conference hosts such a conference regularly and each conference is numbered e.g. 39^{th} AIAA conference or 10^{th} ASME conference.
f. The hosting agency of conference peer review process is strong (acceptance rate) and it publishes the conference proceedings of each research paper presented and not just the abstract.
g. The proceedings of the conference bear an ISSN number, which ensures wide circulation and unique identification of the proceedings. It is indexed in Institute of Scientific Information (ISI) and Scopus.

h. The camera ready research paper carries the full name of "National University of Sciences and Technology (NUST), Islamabad, Pakistan".

15. Undertaking by the Authors:

I (we) undertake that:

a. The paper has significant new work as compared to my (our) papers that have already been published or are under consideration to be published elsewhere. No sentence, equation, diagram, table, paragraph or section has been copied verbatim from previous work unless it is placed under quotation marks and duly referenced. A copy of originality report (duly verified by HoD) checked through "Turnitin" software is attached.

b. The work presented is my (our) own work (i.e. there is no plagiarism). There is no fabrication of data or results. No ideas, processes, results, or words of others have been presented as Authors (s) own work. Where material has been used from other sources it has been properly acknowledged, with verbatim copies of such material being placed under quotation marks.

c. In case any plagiarism is proved, apart from penalties imposed, I will refund entire amount of grant.

d. If the grant is provided, I shall solely be responsible for its proper utilization and adjustment with used air ticket and other receipts of expenditure and refund in case of cancellation of visit.

e. I shall also furnish a Post Visit Report within 10 days after the visit. In case of non-utilization of sponsorship, I will inform Research Dte accordingly.

f. All the supporting documents submitted are authenticated.

g. If above undertaking is untrue I (we) acknowledge that I (we) will have committed a Research Misconduct Offence and am/are liable to receive severe penalties.

16. Previous Contributions

a. Attach details of earlier sponsored participation on conferences, and their status for publishing in a journal of repute.

b. Attach details of papers of the author already published in the journal of repute.

c. Attach details of other contributions

And refer these here.

_____

Name and Signature of Applicant

17. Recommendations by Dean/HoD (including the following):

a. Comments on the value of Paper:
b. Comments on the quality of Conference:
c. Benefits expected for college/institute/centre by attending the conference :
d. Recommended amount of total Funds:

Signature: _____

Name: _____

Designation: _____

18. By Commandant/Principal of College/School/Institute/Centre:

Signature: _____

Name: _____

Designation: _____

19. Remarks/Recommendations of Director (Research), NUST

_____

Signature of Dir (Research)

20. Decision by Approving Authority

Approved/Not Approved/Approved as

_____

Signature of Approving Authority

Appendix 2F

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851213 Fax: (051) 90851202

E-mail: research@nust.edu.pk

APPLICATION FORM FOR GRANT OF FINANCIAL AWARD FOR PUBLICATION BY NUST FACULTY/STUDENTS/RESEARCH STAFF

(Providing information against each column is mandatory)

1. **Publication Details:**

   a. Title of Book/Chapter/Paper:
   b. Abstract/Introduction:
   c. Name of Journal:
   d. ISBN/ISSN Number:
   e. Edition/Volume Number:
   f. Number of Pages Published:
   g. Date of Publication:
   h. Address of Publisher:
   i. Websites/Visibility:
   j. DOI:

2. **Indexation Details**

   a. ISI Indexed(Impact Factor)/ISI Master List/Scopus/NUST Journal/International Journal (Please attached copy of supporting documents also):
   b. Impact Factor of Journal:
   c. ISI Subject Category of Journal:
   d. Rank of the Journal with respect to Impact Factor:
   e. Total Number of Journals in the Subject Category:

3. **Authorship Details**: (Please provide the details of all authors of the research papers).

   a. 1st Author
   (i) Name:
   (ii) Designation: (UG /MS/M.Phil /PhD Scholar/ Faculty Member/Research Staff)
   (iii) Contact No:
   (iv) e-mail Address:
   (v) Organization:
   (vi) Research Interest:
   (vii) Paper Published:
   (viii) Previous Awards Received on Publication of Research Work/Books etc, if any:

b. 2nd Author

(i) Name:
(ii) Designation: (UG /MS/M.Phil /PhD Scholar/ Faculty Member/Research Staff)
(iii) Contact No:
(iv) e-mail Address:
(v) Organization:
(vi) Research Interest:
(vii) Paper Published:
(viii) Previous Awards Received on Publication of Research Work/Books etc, if any:

(To be continued depending upon number of authors)

4. **Confirmation of Publication**:

Published copy of Book/Chapter/Paper to be provided.
This should be from the original publication and not a printout/draft.

5. **Utilization/commercialization aspects of the research work at present and in future with plans and goals:**

6. **Undertaking by the Applicant**

I/we hereby undertake and affirm that

a. The publication has been checked for plagiarism. The substance of the book/chapter/research paper published (as indicated in S.No.1(a) above) is based on the original research conducted by me/us. No sentence, equation, diagram, table, paragraph or section has been copied verbatim from previous work unless it is placed under quotation marks and duly referenced. A copy of originality report checked through "Turnitin" software is attached. In case any plagiarism is proved, apart from penalties imposed, I will refund entire amount of award.
b. No other incentive, reward or financial assistance has been provided by any organization to me for the work as indicated in S.No.1(a).
c. In order to avoid my publication with fake/bogus/predatory publishers and journals, I have carefully selected the journal after considering the latest information on the subject.
d. All the information provided above is true to the best of my knowledge and belief.
e. All the supporting documents submitted are authenticated.

Dated:_____ **Name & Signature of Applicant**

7. **Recommendations of Commandant/Principal of Institution**:

a. Peer review/ objective evaluation of research work:
b. Amount/share recommended for each author:
c. (only NUST authors are eligible)
d. Recommendations:

Dated:_____ **Signature:** _____

Name:_____

Designation:_____

8. **Remarks/Recommendations by Director (Research), NUST**:

_____
Signature of Dir (Research)

9. **Decision by Approving Authority**:

Approved / Not Approved

_____
Signature of Approving Authority

Appendix 2G

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851213 Fax: (051) 90851202

E-mail: research@nust.edu.pk

APPLICATION FORM FOR UNIVERSITY BEST RESEARCHER AWARD FOR THE YEAR (EVALUATION PROFORMA)

1. Particulars of Faculty Member
   a. Name of College/Institute/Centre:
   b. Department:
   c. Name of the Researcher:
   d. Discipline/Subject Category:
   e. Date of Birth:
   f. Present Appointment:

2. Highest Qualifications:
3. Area of Specialization/Research Interest:
4. R&D Profile and Publication — Weightage

   a. Research projects approved in the year of award by external agencies: 10%
      (1) No of projects:
      (2) Description of projects:

   b. Amount of Grant in Pak Rupees/(if in FE apply current exchange rate) obtained against projects: 20%
      (1) Amount:
      (2) Brief Description of Project:

   c. Research papers published in journals with Impact Factor and/or Indexed with ISI: 20%
      (1) No of Papers:
      (2) Papers be attached:
      Note: A chapter in a book will be equivalent to one research paper as above

   d. Research papers published in other recognized/indexed journals: 10%
      (1) No of papers:
      (2) Papers be attached:

   e. Books published (other than thesis publication): 10%
      (1) No of books:
      (2) Title of the Book:

(3) Contents of the Book:
(4) ISBN #:
(5) Brief Detail:

f.	Presenting papers in Conferences and workshops/Seminars etc (1) Subject of the Conference: (2) Duration/Time period" (3) Technical Data: (4) Proceedings Publication etc: (5) Contribution:	5%
g.	Commercialization of R&D Output (1) Amount of Revenue generated (Rs):	05%
	(2) No of Patents filed/approved: Note: Credit will be given at the time of filing as well as approval of patent	05%
h.	PhD students Supervised/Under supervision (1) Student Name: (2) Research/Thesis Topic: (3) Year of Enrolment of student: (4) Date of Graduation of student (if Graduated): Note: Number should not exceed HEC criterion	10%
j.	Supervised and produced MS/M.Phil students: (1) Student Name: (2) Research/Thesis Topic: (3) Year of Enrolment of student: (3) Date of Graduation of student (if Graduated):	05%

Signature of Applicant

Countersigned by Comdt/Principal
Signature_____
Name_____
Designation_____

Note:

i. A claim with insufficient documentary proof will not be considered for points calculation.
ii. Publications, projects, research grants, patents, student supervision etc. related to NUST will only be considered.
iii. A nominee must have some scores in above atleast 04 categories and aggregate score of the nomination should not be less than 25% for the award.

Appendix 2H

National University of Sciences and Technology

H-12, Islamabad, Pakistan, Phone: (051) 90851213 Fax: (051) 90851202

E-mail: research@nust.edu.pk

APPLICATION FORM FOR SPONSORSHIP OF PUBLICATION CHARGES/FEE OF RESEARCH WORK/PAPER TO BE PUBLISHED IN JOURNAL

(Providing information against each column is mandatory)

1. **Publication Details:**
   a. Title of Book/Chapter/Paper:
   b. Title of Journal:
   c. ISBN/ISSN Number:
   d. Edition/Volume Number:
   e. Number of Pages Published:
   f. Address of Publisher:

2. **Indexation Details**
   a. ISI Indexed(Impact Factor)/ISI Master List/Scopus (Please attached copy of supporting documents):
   b. Indexation/Warehouse Website:
   c. URL/Visibility:

3. **Authorship Details:** (Please provide the details of all authors of the research paper)
   a. 1st Author
      (i) Name:
      (ii) Designation: (UG /MS/M.Phil /PhD Scholar/ Faculty Member/Research Staff)
      (iii) Contact No:
      (iv) e-mail Address:
      (v) Organization:
      (vi) Research Interest:
      (vii) Paper Published:

   b. 2nd Author
      (i) Name:
      (ii) Designation: (UG /MS/M.Phil /PhD Scholar/ Faculty Member/Research Staff)
      (iii) Contact No:
      (iv) e-mail Address:
      (v) Organization:
      (vi) Research Interest:
      (vii) Paper Published:

(To be continued depending upon number of authors)

4. **Confirmation of Acceptance/Publication:**
   a. Acceptance Letter:
   b. Reviewers Remarks:
   a. Copy of Camera Ready Research Paper to be provided:

5. **Invoice Details**
   a. Amount:
   b. Due Date:
   c. Details incentive/honorarium/sponsorship offered by any other Organization:

6. **Utilization/commercialization aspects of the research work at present and in future with plans and goals:**

7. **Undertaking by the Applicant**

I/we hereby undertake and affirm that

a. The publication has been checked for plagiarism. The substance of the book/chapter/research work/paper being published (as indicated in S.No.1(a) above) is based on the original research conducted by me/us. No sentence, equation, diagram, table, paragraph or section has been copied verbatim from previous work unless it is placed under quotation marks and duly cited. A verified copy of Turnitin Report is attached. In case any plagiarism in research work and fake/bogus/predatory journal is proved, apart from penalties imposed, I will refund entire amount of funds.
b. No other incentive, reward or financial assistance has been provided by any organization to me for the research work/paper.
c. I will inform Research Dte, if there is any alteration/addition or change in copy of camera ready research paper (provided with the case) for publication.
d. All the information provided above is true to the best of my knowledge and belief.
e. All the supporting documents submitted are authenticated.

_____.

Dated:_____ Name & Signature of Applicant

8. **Recommendations of Commandant/Principal of Institution:**
   a. Peer review/ objective evaluation of research work:
   b. Recommendations:

Signature_____
Name_____
Designation_____

Dated:_____

9. **Remarks/Recommendations by Director (Research), NUST:**

Signature of Dir (Research)

9. **Decision by the Approving Authority**:
Approved / Not Approved

Signature of Approving Authority

Appendix 2J

Monthly Research Update

Name of Institution _____ **For the Month of** _____

1. Project Proposals Submitted:

S.No	Project Title	Name of PI	Date of Submission	Funding Agency	Cost of Project	Duration of Project	Remarks

2. Projects Approved:

S. No	Project Title	Name of PI	Date of Approval	Funded By	Cost of Project	Approved Duration	Expected Start Date

3. Projects In-progress (All):

S.No	Project Title	Name of PI	Funded By	Cost	Progress % age	Reasons for Delay if Delayed

4. Projects completed:

S. No	Project Title	Name of PI	Funded By	Cost of Project	Research Papers		Student Produced		Product Developed	
					Prstd	Pblsd	PhD	MS	Developed	Patent

5. Equipments Procured:

S. No	Title of the Project	Name of Equipment	Model/Specs	Cost	Supplier	Remarks

6. Conference Research Papers:

S. No	Name of Authors (Please highlight NUST's authors)	Title of Paper	Title of Conference, dates, Country, Web-link etc.

7. Journal Research Papers:

S.No	Name of Authors (Please highlight NUST's authors)	Title of Paper	Title of Journal, ISSN, Volume, Number or Issue No, Pages No. and Date of Publication, Web-link

8. Book/Chapter Publication:

S.No	Name of Authors (Please highlight NUST's authors)	Title of Book/Chapter	Title of Book, ISBN, Edition No, Pages No, Date of Publication, Publisher and web link

9. Research Collaboration MoU Signed:

S. No	MoU Signing Organizations	Date of Signing	Kindly provide a copy of MoU

Signature _____

HoD (Research)

Stamp

Appendix 2K

Reports / Returns on Commercial Projects (Quarterly Return)

Name of the Institution _____

1. Project

SN	Project Title	National / International	College/School	MOUs/ Projects/Research Activities/Feasibility Study	Name of Department	Name of PI	Contact Details of PI	Collaborating Industry

2. Project Funding

SN	Project Title	Date of Submission	Date of Approval	Date of Completion	Source of Funding	Funds Approved	Funds Received

3. Projects Benefits to University

S N	Project Title	Paper Presented	Paper Published	Seminar/ Wksp / Conf Conducted	Study Reports	PhD Produced	MS/Mphil Produced	UG Produced	Any Lab Capabilities achieved	Eqpt Purchased	Qty	Cost in Rs.	Profit	Fin Benefit

4. Project Benefit to Industry

SN	Title	Benefit to Industry	Services Generated	Product Generated/Developed	IP Generated	Status	Comments

Signature _____

HoD (Research)

Stamp

Appendix 2K1

Employment Statistics of Recently Graduated Class (Biannually)

College:

Year:

Summary

Sr No	Total Graduated	Employed	Higher Education	Unemployed	

Student Details

Ser	Reg No	Name	CGPA	Email	Discp	Address	Cell No	Contact No	Organization	Status

Signature _____

HoD (Research)

Stamp

Appendix 2K2

Report/Return for HEC (On request)

Note: Annex 2, Annex 3 and Annex 4 to be filled by Schools/Colleges/Centres

Performance Matrices for ORIC
(2nd and subsequent years)

1. Name of the Institution:
2. Date of Establishment of ORIC:
3. Date of Assessment:
4. Summary of Assessment:

SN	Key Performance Indicator	Score Assigned	Scores* Obtained	Remarks
1	Work Environment and Human Resources	10**		
2	Research Support	35		
3	Capacity Building	25		
4	Commercialization of Research	30***		
	Total	**100**		

*****Based on the self-assessment at the following pages
****** Minimum mandatory score is 06 (out of 10) in Work Environment & HR Section
*******Minimum mandatory score is 15 (out of 30) in Research Commercialization Section

5. Ranking of the ORIC: **W**

Ranking Criteria

Category	Score	Performer Scale
W	75 and above	Top Performers
X	60 – 74	Satisfactory Performers
Y	40- 59	Below Average
Z	1 - 39	Poor Performers

Declaration:

This is to certify that all the information given in this form is correct and true to the best of my knowledge and belief.

Date and Stamp **Signature (Director ORIC)**

Date and Stamp **Counter Signature (Vice Chancellor/Rector)**

PERFORMANCE MATRICES FOR ORIC

SN	Key Performance Indicator	Parameters/Items	Max. Scores	Scores Obtained	Documentary Evidences	
1	**Work Environment and Human Resources (Max. Score 10)**					
(i)	Available facilities	Fully furnished office	02	02	Physical Visit Report	
		ICT facilities in ORIC (Computers, phone, internet etc.)	01	01		
(ii)	Human Resources	Director (full time)	02	02	**As per format attached**	Appointment letter/ Notification / Joining Report against each (ORIC having less than 6 scores in this section will not qualify for further assessment)
		Manager Research Operation /equivalent position (full time)	01	01		
		Manager Research Development /equivalent position (full time)	01	01		
		Manager University Industry Linkages and Technology Transfer / equivalent position (full time)	01	01		
		Administrative Assistant (full time)	01	01		
		Research Associates/ Assistant / staff (full time)	01	01		
	Sub-Total (1)		**10**	**10**		
2	**Research Support (Max. Score 35)**					
(i)	Number of research proposals approved for funding by HEC.	If the number of such proposals is equivalent to the: 1-4% of total existing faculty 5% and above of total existing faculty	 02 06	06	**As per format attached**	Copy of award letter HEC
(ii)	Number of research proposals	If the number of such proposals is equivalent to the:				Copy of award letter from the sponsoring

	approved for funding (other than HEC)	1-4% of total existing faculty 5% and above of total existing faculty	02 05	05		organization
(iii)	Number of joint research projects approved.	At national level: 1- 4 5 and above	02 04	04		Copy of award letter
		At international level: 1- 4 5 and above	02 04	04		
(iv)	Number of research links established with other HEIs	At national level: 1- 4 5 and above	02 04	04		Copy of MoU / Agreement etc.
		At international level: 1- 4 5 and above	02 04	04		
(v)	Number of research articles presented in national & international conferences & Seminars.	If the number of such articles is: 1-9 10 and above	02 04	04		Copy of the conference program and first page of the research articles as published in proceedings of the program.
(vi)	Maintain a comprehensive and centralized Research Database.	If it is maintained in Excel Sheet/ MS Access etc. If any customized software is being used for it	03 04	04		Physical Verification MS Excel Enterprise Resource Planning (ERP) Snapshots attached
	Sub Total (2)		**35**	**35**		
3	**Capacity Building (Max. Score 25)**					
(i)	No. of trainings/ workshops / seminars arranged on entrepreneurship, commercialization, innovation etc.	1-4 5 and above	02 04	04	**As per format provided**	Copy of Brochures/Leaflet / Letters/program details etc.
(ii)	No. of workshops/ seminars arranged at national or International level [other than those given	1-9 10 and above	04 06	06		Copy of Brochures/Leaflet / Letters/program details etc.

	under 3 (i) above]					
(iii)	Participation of faculty/students in training workshop /seminar on entrepreneurship, commercialization innovation etc. arranged by other institutions/HEIs	1-4 5 and above	02 04	04		Certificate of participation
(iv)	Participation of faculty in training workshop/ seminar arranged by other institutions/HEIs	If the number of such trainings attended is: 1-4% of total existing faculty 5% and above of total existing faculty.	02 04	04		Certificate of participation/copy of paper as published in proceedings
(v)	No. of training workshops/ seminars attended by ORIC personnel	1-4 5 and above	01 02	02		Certificate of participation
(vi)	University has incorporated Entrepreneurship as Optional Course in syllabi	No Yes	0 05	05		Copy of the program/syllabus etc.
	Sub Total (3)		**25**	**25**		
4	**Research Commercialization (Max. Score 30)**					
(i)	Development of Research/ Intellectual Property/ Innovation policy of the institution	If the process for preparation of draft has been Initiated If the draft has been Completed If the draft has been approved by statutory body	02 03 04	04	**As per format provided**	Notification to initiate the process/Composition of committee for the task or any other
(ii)	Webpage for ORIC reflecting all the activities	If webpage exists and contains only contact information of Director ORIC + reflects updated research activities If the webpage reflects also the updated available research expertise and equipment of each Department then If the webpage also reflects the updated success stories	02 04	06		Webpage link

			06			
(iii)	Ideas Competition/ Innovation/ entrepreneurial competition held	Ideas Competition	02	02		Copy of Brochures/Leaflet / Letters/program details etc.
		Innovation/ entrepreneurial competition	03	03		
(iv)	No. of links established with industrial & corporate sector	1 – 4 5 and above	02 03	03		Copy of MoU/ Contract/ Agreement
(v)	No. of patent/designs/ formula/approved varieties	1-4 5 and above	02 03	03		Copy of approval letter/patent grant letter
(vi)	No. of business plans developed	1 – 4 5 and above	02 03	03		Copy of the patent acceptance letter
(vii)	No. of research products/ process gone into prefeasibility/ prototype development	1-2 3 and above	02 03	03		Any relevant documents
(viii)	Establishment of Incubation Centers	If establishment in process If it is already established	02 03	03		Notification/ letter indicating date of its establishment or process initiation
	Sub Total (4)		**30**	**30**		

Table of Contents

	4-Research Commercialization		
i	Development of Research/IP/Innovation policy of the institution		
ii	Webpage for ORIC reflecting all the activities		
iii	Number of Ideas Competitions /Innovation /Entrepreneurial competition held		
iv	No. of links established with industrial and corporate sector		
v	No. of patent/designs/ formula/approved varieties		
vi	No. of business plans developed		
vii	No. of research products/process gone into prefeasibility/ prototype development		
viii	Establishment of Incubation Centers		

HUMAN RESOURCES

SN	Name	Designation	Qualification	Date of Joining	Evidence at Page No.

SN	Total number of Sanctioned Posts (Faculty only)	Total Number of Existing Faculty	Total number of vacant Posts (Faculty only)

RESEARCH SUPPORT

(i) Number of Research Proposals approved for funding by HEC

SN	Title of Research Proposal	Amount Approved (Rs.)	Date of Approval	HEC Ref. No.

(ii) Number of research proposals approved for funding (other than HEC Source/Funding)

SN	Title of Research Proposal	Amount Approved (Rs.)	Date of Approval	Sponsoring Agency	Page No. of Evidences

(iii) Number of Joint Research Projects approved

SN	Title of Research Projects	Amount Approved (Rs.)	Date of Approval	Sponsoring Agency	Collaborating Partner	Page No. of Evidences
National						
International						

(iv) Number of Research Links Established with other HEIs.

SN	Name of host Department	Collaborating Agency/Institution	Scope of Collaboration	Date of Link Established	Page No. of Evidences
National					
International					

(v) Number of Research Articles/Papers presented in National/International Conferences/Seminars.

SN	Author(s)	Title of Paper	Title of Conference	Date & Venue of Conference (Country/City)	Page No. of Evidences
National					

International					

CAPACITY BUILDING

(i) Number of Trainings/Workshops/Seminars arranged on entrepreneurship, commercialization and innovation

SN	Title of Workshop/ Training	Date of Event	No. of Participants	Major Focus Area	Audience Type (student /faculty /staff)
National Workshops/ Trainings					
International Workshops/ Trainings					

(ii) Number of Workshops/Seminars arranged at National or International level [other than those given under 3 (i) above].

SN	Title of the Training /workshop	Date of Event	Major Area of Training	Number of Participant	Audience Type (student /faculty /staff)
National					
International					

(iii) Participation of Faculty/students in Training/Workshops on entrepreneurship, commercialization and innovation etc. arranged by other HEIs.

SN	Title of the Training /workshop	Date of Event	Name of HEI	Major Area of Training	Number of Participant	Audience Type (student /faculty)

(iv) Participation of Faculty in Training/Workshops/Seminars arranged by other HEIs.

SN	Title of the Training /workshop	Date of Event	Name of HEI	Major Area of Training	Number of Participant	Audience Type (student /faculty)

(v) Number of trainings, workshops/seminars attended by ORIC personnel

SN	Name of Participant & Designation	Title of the Workshop & Venue	Date of Event	Major Area / discipline	Organized by

(vi) University has incorporated "Entrepreneurship" as optional course in syllabi

SN	Title of Course	Couse level (undergrad/ postgrad)	Credit Hours	Number of disciplines in which course is taught

MEASURES TAKEN FOR RESEARCH COMMERCIALIZATION

(i) Development of Research/Intellectual Property /Innovation policy of the Institution

SN	Title of IP/Innovations policy	Draft Status; Initiated/Prepared /Approved	Date Initiated/Prepared /Approved

(ii) Webpage for ORIC reflecting all the activities

SN	Short link for the ORIC Webpage	List of activities (including list of available expertise and equipment) being reflected on the webpage	Contact information reflected on webpage

(iii) Ideas competition /innovation/ entrepreneurial Competitions held

SN	Title of competitions	No. of Participant	Date & Venue	Page No. of Doc. Evidences
Ideas Competition				
Innovation/Entrepreneurial Competition				

(iv) Number of Links established with Industry /Corporate Sector

SN	Title of the collaboration	Name of Industrial/ Business Partner	Date of link established	Department of university with which link has been established	Major Area of linkage	Page No. of Doc. Evidences

(v) No. of Patent/Designs/Formula/approved varieties.

SN	Title of patent /designs /formula	Name of the Principal Investigator	Date of filing/approval / issue	Approving /granting authority	Major Area	Page No. of Doc. Evidences

(vi) Number of Business Plans Developed

SN	Title of Business Plan	Name designation of Developer	Date of approval	Approving authority	Major Area

(vii) Number of research products/process gone into prefeasibility /prototype development

SN	Title/Name of the Product or Process	Principal Investigator	Research project title under which product or process is being developed	Current Status

(viii) Establishment of Incubation Centers

SN	Status of Establishment (already established or in process)	If established list of Companies Incubated	List of Companies Graduated	No. of HRs Working.	Page No. of Doc. Evidences

CHAPTER 3: INNOVATION & COMMERCIALIZATION POLICY

3.1 Introduction

Vision for National University of Sciences and Technology (NUST) emphasizes its role in fostering innovation and entrepreneurship. Directorate of Innovation and Commercialization has a significant role to play towards achieving this vision. Commercialization at universities internationally is not just restricted to technology transfer. In fact, it explores various avenues to achieve the end of revenue generation through University-based technologies. Generally, the most common paths for commercialization may broadly be divided into four categories. These include:

1. Contract/Collaborative research
2. Technology and Business Incubation
3. Equity based partnerships
4. Licensing out University Technologies

The National University of Sciences & Technology has been extensively involved in exploring the first path to commercialization i.e. Contract/Collaborative Research through its Directorate of Research as far back as its nascent years. The Constituent Institutions of NUST, in their individual capacities, have also traditionally been actively involved in collaborative research projects with various entities. Similarly, NUST, through its Technology Incubation Centre has been actively involved in commercialization activities through technology and idea incubation since 2005. The University also houses within itself a holding company by the name of Science & Technology Ventures that acts as a vehicle for commercialization through equity based partnerships. However, with the creation of the Commercialization and Technology Transfer Office, the University is now also focusing on commercialization through licensing NUST technologies. The ultimate objective is optimization of commercialization activities through the creation of spin off companies, be it

through the platform of the Technology, Incubation Centre, ST Ventures or the Technology Transfer Office etc. The role of I & C Directorate is to encapsulate NUST's research and intellectual property opportunities at the earliest stage, and to translate these benefits to industry by working closely with industry through partnerships, collaborations and licensing. I & C Directorate is responsible for moving research results from the laboratory to the market place. It does so by being fully aware of the university R&D activities, R&D disclosures and market needs. The Industry Liaison Office (ILO) nurtures relationships with industry and brings knowledge about industry's problem to researchers at NUST. The Intellectual Property Office (IPO) determines the patentability of a technology and provides assistance with protection of intellectual property. Technology Transfer Office (TTO) assesses commercial potential and successfully transfers technology for commercial applications with the assistance of ILO. The current structure of I&C Directorate along with ToRs of each office is given at Appendix 3A. The work flow diagrams along with explanation of the working of I&C Directorate is given at Appendix 3B (pages (i) through (xv)

3.1.1 Objectives

Objectives of I&C Directorate are to:

1. Maintain a climate in which exploitation of Intellectual Property generated in the course of research and development activity is a normal and automatic consideration by creating awareness about the concept of commercialization at NUST constituent colleges/schools/Institutes/Centres.
2. Develop and maintain industry linkages and identify specific industry partners for the ongoing research and development at NUST.
3. Provide efficient and comprehensive services for IP management, technology transfer, and industrial relations.

4. Explore and evaluate market potential for technologies and inventions developed within and outside NUST.
5. Market technologies and inventions by seeking industry partners who are best placed to take advantage of such technologies.
6. Negotiate licensing terms to develop a mutually beneficial business relationship.

3.2 Key Challenges Expected in Achieving These Objectives and Goals

3.2.1 Delivering Integrated Solutions to Industry

Industry expects complete and integrated solution to their key problems which require minimum change in their infrastructure and processes. Technologies developed at universities are the brain child of an expert in a particular domain. There is lack of experts who can give industry, the complete integrated solution after analyzing problems faced by industry.

3.2.2 Alignment of Academic R&D with Industry's Needs

Technologies developed at universities are the outcome of some research which most of the times is not aligned with the industrial problems or needs. When such inventions are made, either they do not have market potential at all or they have entered the maturity and decline stage.

3.2.3 Industrial Problem Identification

Succinct information about key problems, bottlenecks and rate limiting factors faced by industry is not available to faculty. Industry and academia often use incompatible terminology which further accentuates the situation.

3.2.4 Commercial Scale Implementation of Laboratory Scale Solutions

Academia typically lacks facilities, expertise and resources needed to scale up laboratory scale solutions to commercial scale implementation.

3.2.5 Lack of Incentives for Faculty

Current criteria for faculty career growth heavily favors publication of research papers instead of rewarding efforts towards solving local industry's problems.

3.2.6 Lack of Incentives for Industry

Frequently there is lack of industrial willingness to incorporate indigenous solution in high cost machinery and equipment developed at local universities. Typically the risks involved in incorporating newly developed technology outweigh its benefits, especially when the cost benefit analysis is done based on current sunken infrastructure cost and projected revenue models.

3.2.7 Stretched Funding Process

At times the funding processes for development of technology are so stretched out that technology matures by the time it comes to the market. Furthermore these specialized grants are generally awarded in small amounts which fall short of the substantial cost to build a commercial enterprise or to commercialize that technology.

3.2.8 Mismatch in Timescales Followed by Industry and Academia

R&D in universities has to follow time scale set by degree awarding programs. Industry on the other hand follows market driven timescales.

3.2.9 Pool of Experts:

We face critical shortage of experienced professionals who are capable of handling the complex, multidisciplinary and meticulous work associated with University-Industry collaborations. There is an acute need for personnel with a good deal of business expertise who can handle the administrative and business work associated with University-Industry collaboration and technology transfers. Such personnel should have an understanding of science and engineering and knowledge of the law. These individuals must also

understand how two different communities, the academic and the business, operate. The challenge is to have the pool of experts from different fields to analyze the diverse technologies and their commercial potential.

3.2.10 Conflict of Interest:

The call for more University-Industry collaboration is well grounded amid trends toward intensifying global competition and the drive towards a knowledge-based economy. But these changes should not take place at the expense of the fundamental mission of universities. It remains that universities must pursue several different, conflicting goals. They must still fulfill their primary mission to teach students, and this goal cannot be compromised. While university professors are given greater freedom to work with the private sector, there should be a separation between their academic and commercial activities. There is a real risk of a conflict of interest. In general, such a conflict is defined as a situation in which a public obligation competes with a financial interest. Research priorities may be skewed towards applied research that tends to produce immediate financial benefit. Universities may inhibit intellectual freedom and thus foster public mistrust and distract faculty members from the university's essential functions of teaching and basic research.

3.3 Strategies

3.3.1 Knowledge Management System

A comprehensive, state of the art information flow and knowledge management system will be developed. This web enabled system will be designed with focus on information flow and information processing needs of all stakeholders associated with R&D, its financial support and commercialization. These stakeholders include industrial partners, faculty and researchers, funding agencies etc.

3.3.2 Develop a Pool of System Integration Experts

A pool of system integration experts will be created. Services of these experts will be acquired for analyzing industry's needs and delivering integrated solutions to industry. These experts will translate industry's needs into specifications understood by researchers and developers who excel in their own specializations. Funds for leveraging services of such experts will be made available through NUST Fund. For this, there is a requirement of "Case Managers" to work with Technology Transfer Office. The desired organization structure of TTO is given at Appendix 3D. Till the time TTO is organized, "HoD Research" (formed as per para 2.6.3) will also act as Case Managers in their particular domain.

3.3.3 Align University Research with Industry Needs

A strong Industry Liaison Office (ILO) will be developed to nurture industry linkages and identify specific industry partners for ongoing research at NUST. Support and focused knowledge exchange with NUST Corporate Advisory Council (CAC) and its subcommittees will be essential for achieving this connectivity with industry. Research Directorate and Technology Transfer Office will gauge industry needs and process match making with NUST Schools to develop R&D proposals and projects focused at solving industrial problems. Industrial relations developed by Professional Development Center (PDC) and Career Development Center (CDC) will also be leveraged to create this connectivity.

3.3.4 Incentives for Faculty

Although faculty incentives have already been described in para 2.10, it may be re-emphasized that delivery of solutions to industry through adaptation of existing or newly developed technology will be given equal recognition towards faculty career development than research and development that leads only to publication of research papers in international conferences and professional journals of repute. NUST will hold yearly conference titled "National Industrial Technology Conference "followed by "NUST Technology

Fair". This conference will be focused at solutions delivered to industry. Papers will be accepted through a peer review process. Referees will be selected from industry. Members of CAC and its subcommittees will play a significant role in evaluating submitted papers. The conference may be held in Islamabad and Karachi on alternate years. For NUST internal evaluation of faculty performance papers published in this conference will be evaluated to Impact Factor publications through evaluation. All efforts will be made to convince HEC to follow this policy for faculty performance evaluation. Furthermore every year best innovation award will also be given to recognize the efforts of our researchers/faculty members/students. Criterion of best innovation award is attached as Appendix 3E.

3.3.5 Incentive for Industry

NUST technology strengths including laboratory equipment and specialized manpower will be made available to industry to reduce industry's cost of maintaining such specialized resources. In addition, industry needs financial incentives to incorporate locally developed solutions. Providing such financial incentives is truly out of scope of NUST charter. However, NUST will join hands with CAC and other professional trade organizations to encourage government to create industry specific innovation and commercialization funds. A good example is the National ICT R&D Fund. This fund is financed by an R&D fee collected from telecommunication operators based on their revenues. In fact such funds for other industries like pharmaceuticals and energy already exist but are not functional. Similarly, HEC will be approached to aggressively promote its University-Industry Technology Support Programme (80/20 funding program), under which if industry puts 20% for funding needs HEC gives 80% of the financial requirement. A similar program for technology commercialization should be supported by HEC and MoST.

3.3.6 Provide Support for Technology Commercialization

Public funding is typically available for research and development. There are very few resources available for converting laboratory scale prototype and solutions developed as a result of R&D to commercial scale

integration, production and distribution of goods and services. Cost of commercialization of technologies developed at universities is typically higher than the cost of R&D that produces these technologies. In addition, an industry partner is needed. Following strategies will be pursued to meet challenges mentioned above:

3.3.6.1 Early involvement of Industrial Partners

Given the high cost of some forms of commercialization, a general strategy followed in the 1st world is for universities to fund discovery stage academic research and then seek industrial partnerships to continue development of potential commercial technology. In this model basic scientific discoveries or innovative engineering technologies with translational potential are identified and out-licensed to industry for further development and testing. In context of a 3rd world country like Pakistan it is much more prudent to involve industrial partners in very early stage of R&D project and proposal development. This early stage involvement of industry goes a long way in smooth industrial integration of developed technology and minimizes cost of commercialization.

3.3.6.2 Streamlining the function with Research Directorate

Projects are submitted at R & D Directorate for funding and other facilitation. The application of such projects will be shared with I & C Directorate for analysis of its commercial potential. This will encourage timely involvement of commercialization team and will also help in looking for industrial partners who are potential buyers for the technology.

3.4 Methodology for Commercialization

There are several routes to commercialization of technology created via research and development in a university. Depending on characteristics of an innovation we can chose from the methods of commercialization described subsequently.

3.4.1 Creating a New Business

The creation of a new business based on the innovation reflects situations where the innovation forms the basis for creation of a new firm to exploit the innovation. This new firm acquires or develops complementary assets needed to commercialize the innovation. Services of STV or TIC will be leveraged for this purpose, inline with their existing policies.

3.4.2 Promoting Innovations

Ongoing development and marketing of the innovation to firms that use the innovation in their business reflects situations where the right to use innovation is licensed to firms for a specified period. University/researcher will retain ownership of the innovation and will be often involved in enhancing the innovation so that it can continue to mine the innovation for additional revenues. In such situations, the innovation will be licensed to more than one entity. This will occur through non-exclusive licensing.

3.4.3 Disposition of the Innovation to an Established Firm

Disposition of the innovation to an established firm reflects situations where the innovation will be adopted by an existing firm. The established firm should have the capacity and complementary assets needed to commercialize the innovation. The innovation will be sold outright or licensed on an exclusive basis so that licensee obtains substantially all of the risks and benefits of ownership of the innovation. The university/researcher will retain no ongoing rights to the innovation or its future enhancements.

Details of commercialization process are provided in Appendix 3B. A sample of Term Sheet and Licensing Agreement is attached as Appendix 3C.1 and Appendix 3C.2 respectively.

3.5 Stake Holders

The key stakeholders of commercialization process and policy are:

a. Inventor (student, faculty or employee of NUST or researchers from other universities)
b. Institution (NUST)
c. Industry
d. Funding Entities
e. Communities, Legislators, media are all important stake holders

3.5.1 Support I&C Directorate will expect from Stakeholders

a. I&C Directorate understands and accepts that teaching, research, and publishing research results are of paramount importance, and will not ask faculty to unreasonably delay publication of research results in the interests of commercialization.

b. We expect that Inventors should be sensitive to the institutional and public interests at stake in the commercialization process and equitably balance them with their personal interests.

c. The institution has a responsibility to the public to ensure that the institution is reasonably compensated for the use of its intellectual property so that it can further support its public mission.

3.5.2 Support I&C Directorate will provide to Stakeholders

a. Manage strong relationships among licensees, the institution, and faculty.
b. Devise and implement commercialization strategy for NUST.
c. Oversee, supervise, manage and coordinate activities within the Directorate of Commercialization related to technology transfer, IP protection and industrial relations.

d. Develop relationships with public/private sector with respect to intellectual property and commercialization activities.

e. Enhance commercialization capacity of University's researchers through disseminating relevant information and conducting coaching sessions.

3.6 Ownership of Technology

Refer to NUST IP Policy.

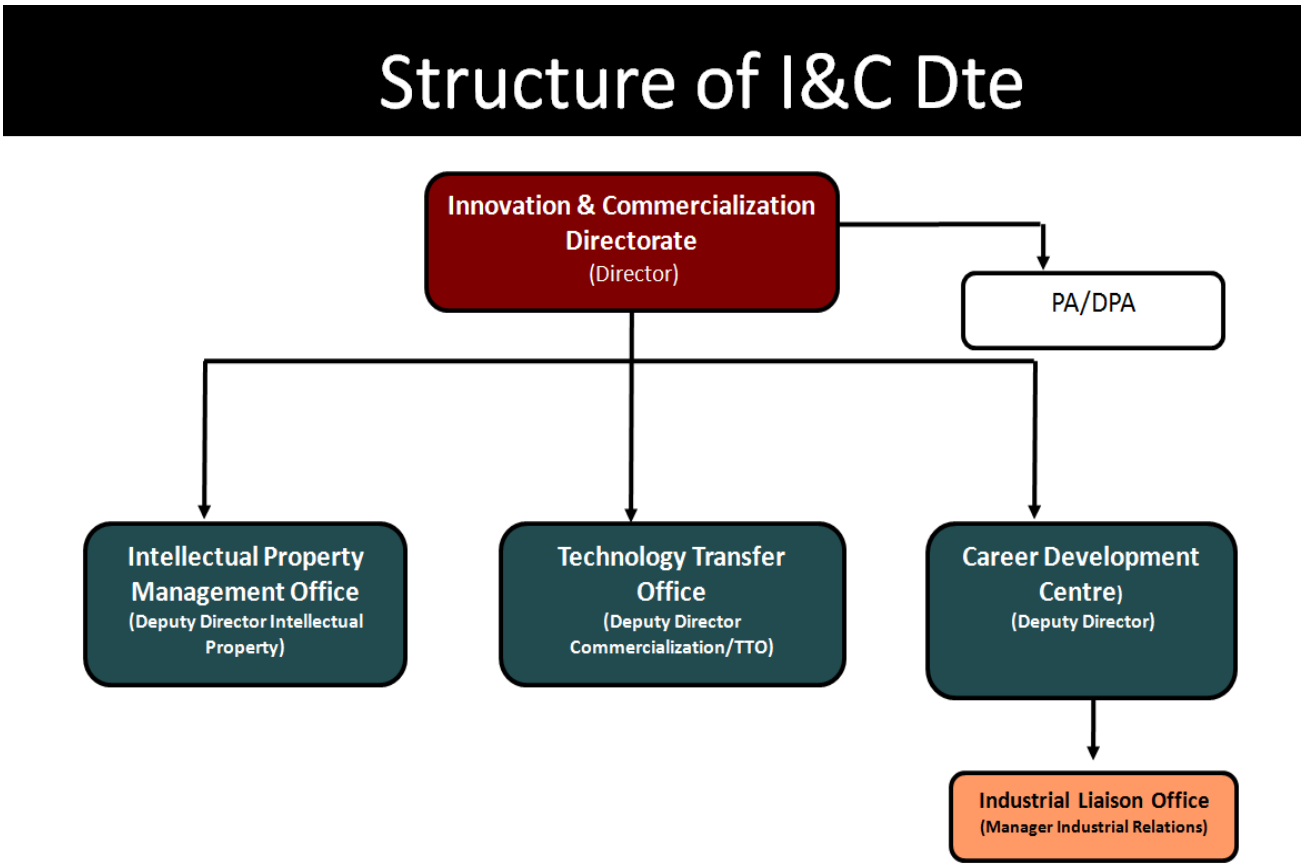
3.7 Implementation

The Innovation & Commercialization Directorate NUST shall implement this policy and maintain appropriate processes and procedures to administer it.

3.8 Review

This policy will be reviewed biennially with effect from date of its approval

Appendix 3A: Current Structure & TORs of I&C Directorate



However this policy recommends introducing case mangers concept for dealing with the tech transfer cases in their respective domains if the need may arise as shown in Appendix 3D

TORs of NUST I&C Dte Offices

The I&C Directorate is responsible for commercializing NUST owned intellectual property in particular and Non-NUST IP in general, through the following core activities:

Intellectual Property Office (IPO)

- Managing University's intellectual property portfolio.
- Continuously keep IP policy updated to meet NUST research needs and ensure its implementation in letter and spirit.
- Develop efficient processes for protection of NUST IP and ensure that NUST researchers are kept informed
- Create awareness within the University
- Participate in University open houses to identify IP related projects
- Establish a national network of Intellectual Property Rights related services
- Collaborate with International Organizations such as WIPO to facilitate the filing of Patents at international level
- Strengthen the capacity of University to develop strategies, policies and programs to meet the intellectual property needs of SMEs/incubatees

Technology Transfer Office (TTO)

- Creating clear processes for the commercialization of technology developed by NUST faculty, researchers and students

- Provide consistent set of expectations for business and industry partners who wish to commercialize NUST research, setting realistic goals for license terms and time required for completing the licensing process
- Explore and evaluate market potential for technologies and inventions developed at NUST
- Market technologies and inventions by seeking industry partners who are best placed to take advantage of these technologies, and negotiate the licensing terms to develop a mutually beneficial business relationship
- To identify commercialization potential for Non-NUST technologies of Non-NUST Entities.

Career Development Centre (CDC)

- **Career Guidance/Soft Skill Development:**
  - To organize and conduct various career guidance and soft skill development workshops including recommendations for change in curriculum.
  - Conduct of career counseling for NUST Students.
- Internships and Placement:
  - To coordinate all activities of internees allocated to NUST under Pakistan Internship Program.
  - Acquisition of job opportunities / placement from industry and handling all activities to facilitate identification and coordination for placement of NUST graduates.
  - Facilitation of internship including acquisition of internship slots and coordinating with industry as well as NUST institutions on the subject.

- Conduct of employer's sessions.

Take feedback of student capabilities from industry and apprise / advise NUST management accordingly.

Industrial Liaison Office (ILO)

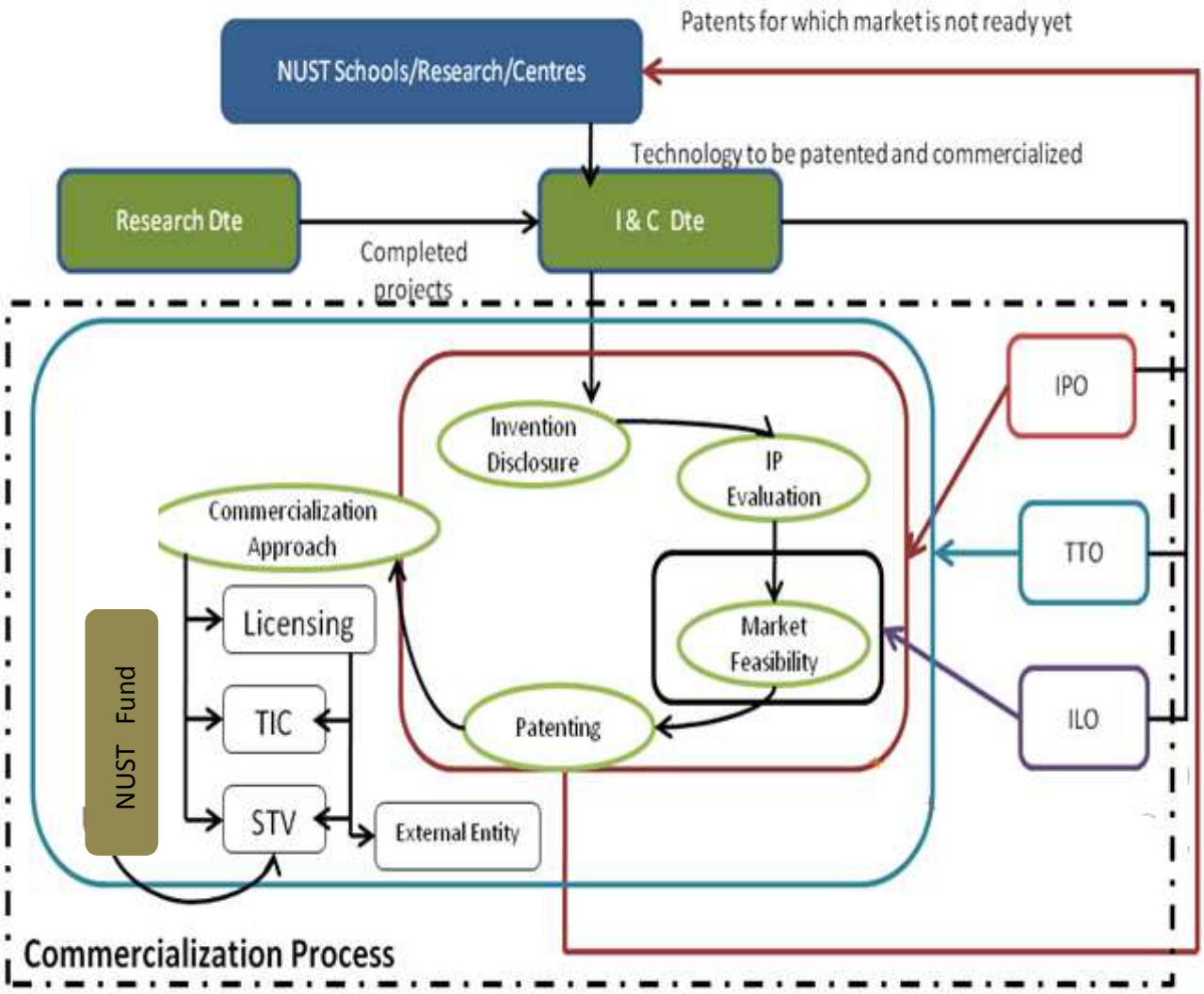
1) Industrial Relations:

- build and maintain strong Academia -Industry Linkage with the focus on promoting and making NUST graduates the premium choice for the Employers"
- Develop and maintain industry linkages and identify specific industry partners for the ongoing research at NUST
- Gauge industry needs and process match making with NUST Schools to solve industrial problems
- Assist TTO in identifying potential partners/buyers of new technology
- Assist TTO in assessing commercial potential of new invention or technologies
- Establish and nurture enduring relationships between industry, society, government and researchers, assisting in the identification, protection and enhancement of intellectual property, and developing and implementing its path to adoption. Invite industrial partners and entrepreneurs to collaborate with us in turning technologies into useful and successful products that can contribute to society
- Assist TTO to conduct workshops, symposiums and seminars to create awareness about the concept of commercialization at NUST constituent colleges/schools

2) Alumni Relations:

- Coordinate and promote alumni activities by acting as NUST Alumni Secretariat.

Appendix 3B: Workflow Roles of Offices at I&C Dte

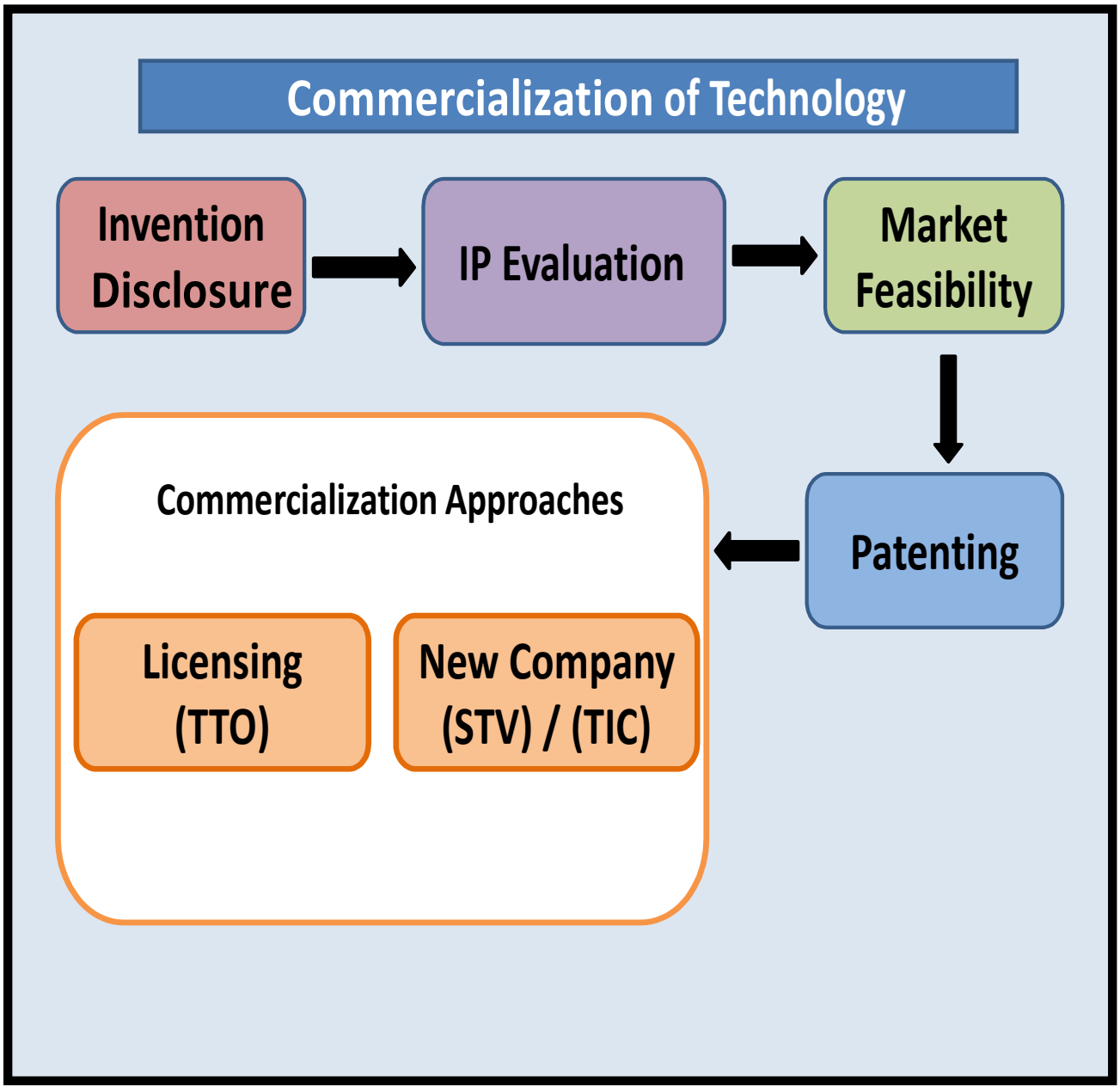


IPO: Performs the IP evaluation and understand the scope of each claim and purpose of the product/technology and analyze the patentability of that technology

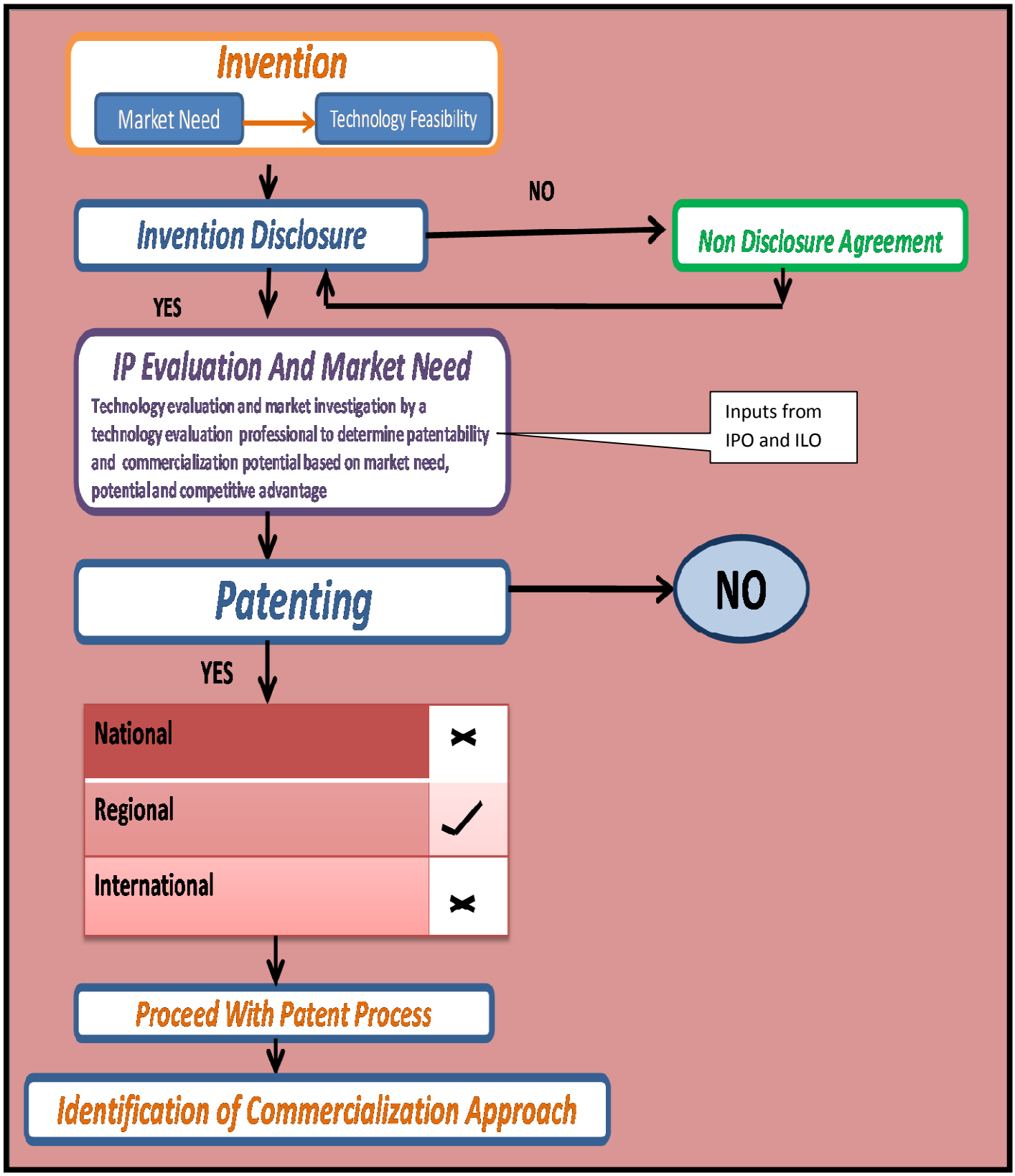
TTO: Technology Transfer office is responsible for creating clear processes for the commercialization of technology developed by NUST faculty, researchers and students. Case manager at TTO is involved throughout the commercialization process

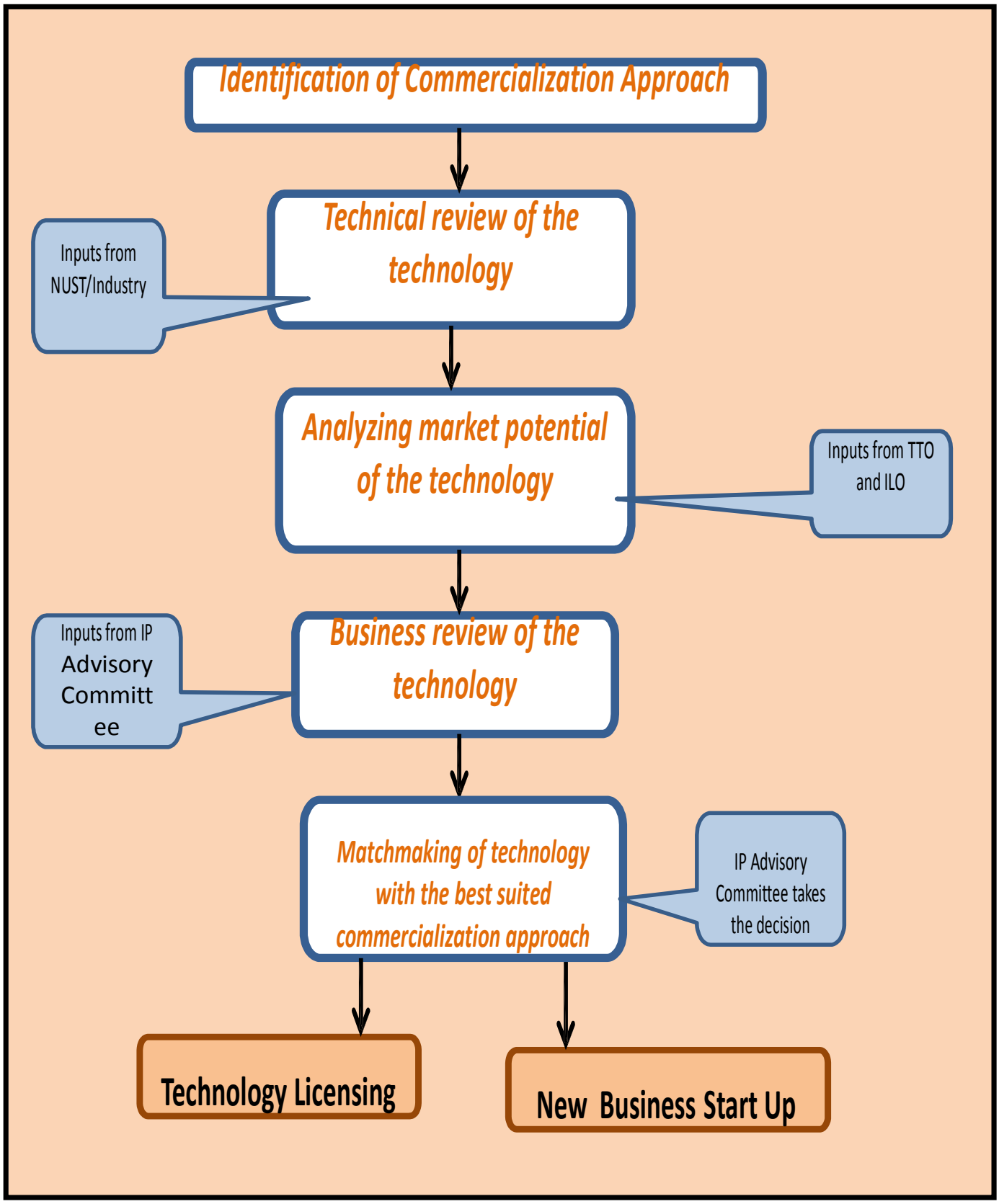
ILO supports TTO in determining the commercial potential of the technology and also in seeking potential licensee for the technology (for details see chapter 3)

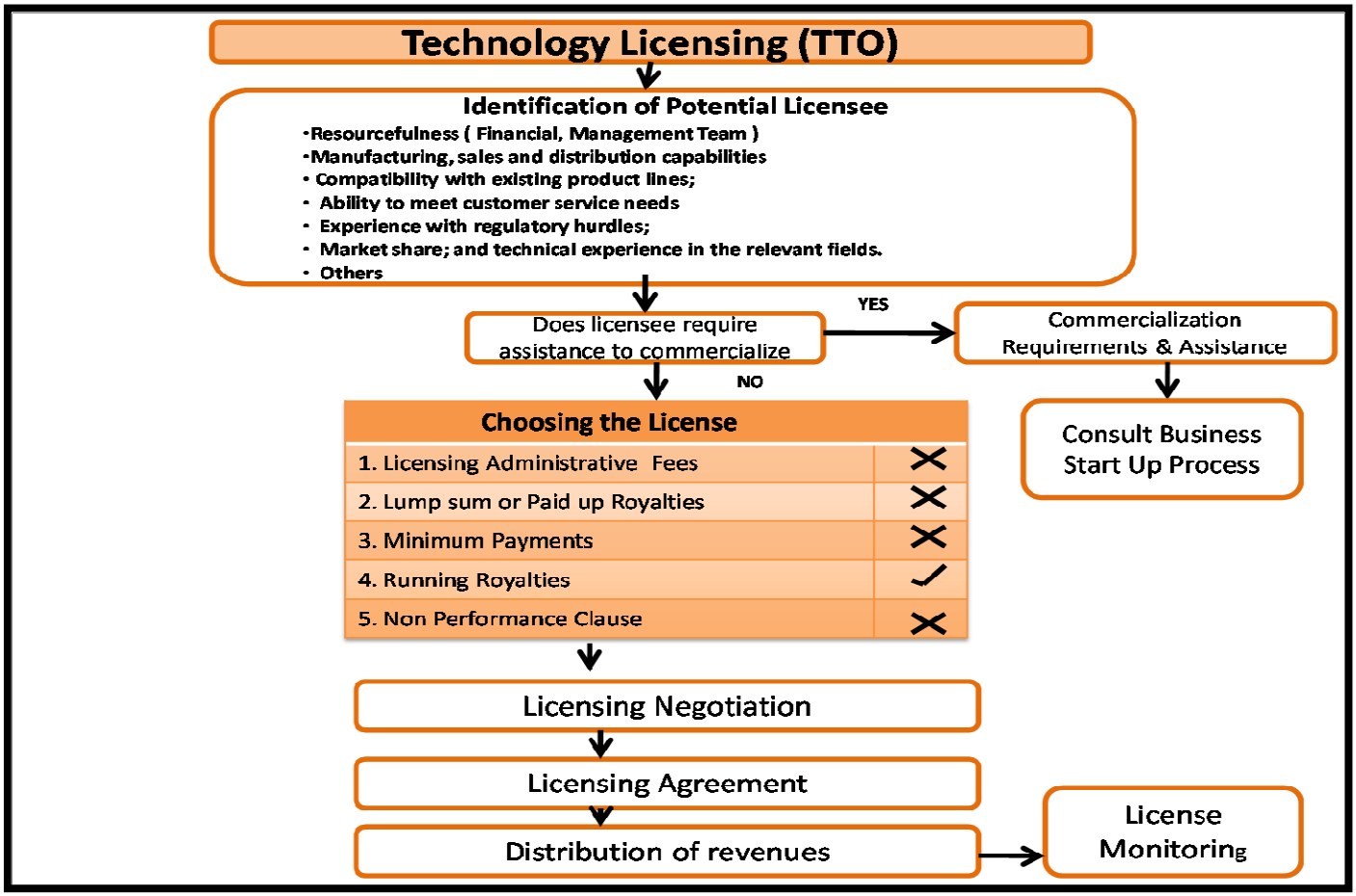
Process of Commercialization

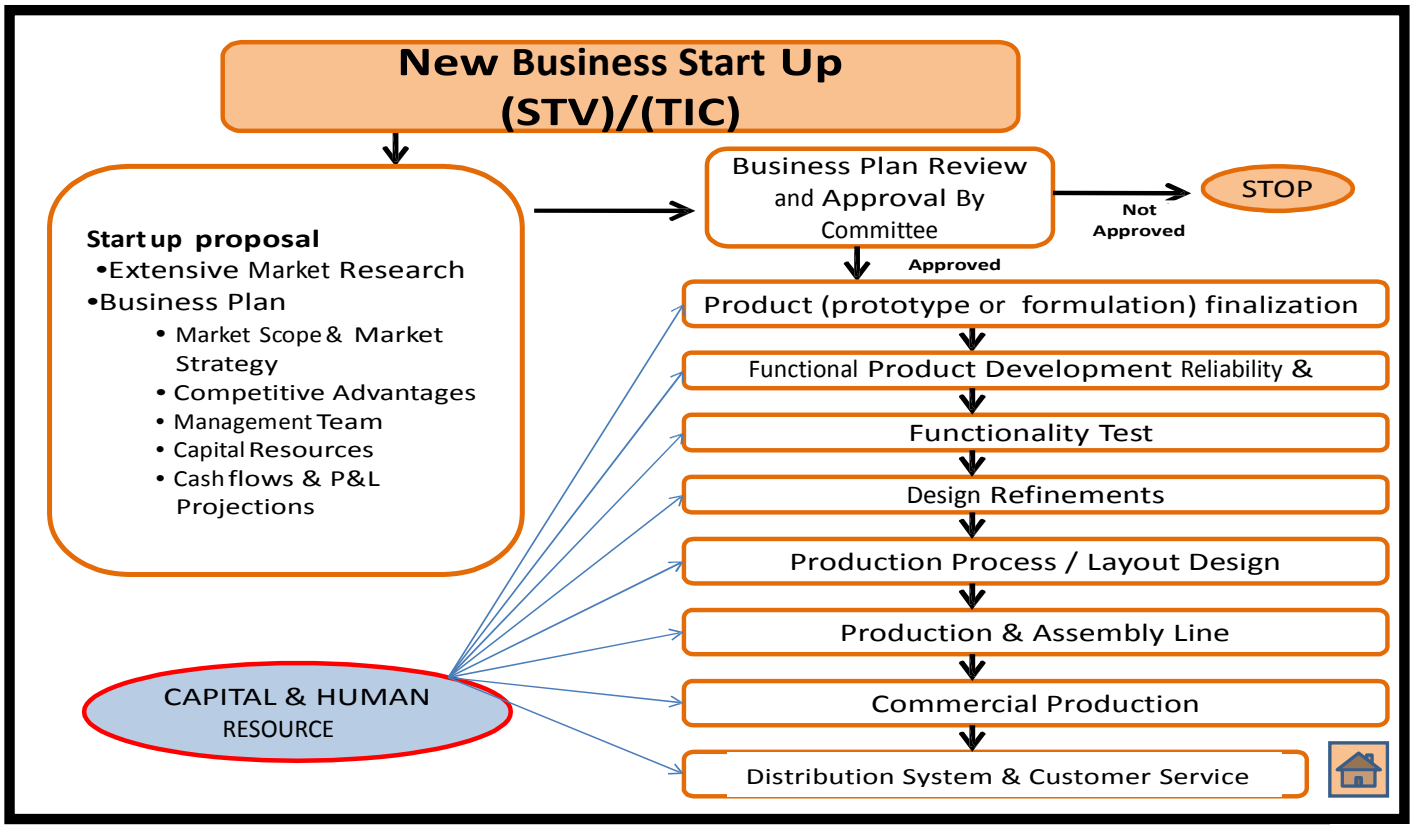


Commercialization of Technology




Identification of Commercialization Approach
Technical review of the technology
Inputs from NUST/Industry
Analyzing market potential of the technology
Inputs from TTO and ILO
Business review of the technology
Inputs from IP Advisory Committee
Matchmaking of technology with the best suited commercialization approach
IP Advisory Committee takes the decision
Technology Licensing
New Business Start Up


Technology Licensing (TTO)
Identification of Potential Licensee
•Resourcefulness (Financial, Management Team)
•Manufacturing, sales and distribution capabilities
• Compatibility with existing product lines;
• Ability to meet customer service needs
• Experience with regulatory hurdles;
• Market share; and technical experience in the relevant fields.
• Others
Does licensee require assistance to commercialize
YES
Commercialization Requirements & Assistance
Consult Business Start Up Process
NO
Choosing the License
1. Licensing Administrative Fees
2. Lump sum or Paid up Royalties
3. Minimum Payments
4. Running Royalties
5. Non Performance Clause
Licensing Negotiation
Licensing Agreement
Distribution of revenues
License Monitoring


New Business Start Up (STV)/(TIC)
Start up proposal
•Extensive Market Research
•Business Plan
• Market Scope & Market Strategy
• Competitive Advantages
• Management Team
• Capital Resources
• Cash flows & P&L Projections
Business Plan Review and Approval By Committee
Not Approved
STOP
Approved
Product (prototype or formulation) finalization
Functional Product Development Reliability &
Functionality Test
Design Refinements
Production Process / Layout Design
Production & Assembly Line
Commercial Production
Distribution System & Customer Service
CAPITAL & HUMAN RESOURCE

Stage 1: Invention Disclosure

1. The technology transfer process normally begins when an inventor(s) submits an invention disclosure to I & C DIRECTORATE. (NUST Invention Disclosure Form is attached as appendix 3C.3)
2. Every incoming invention disclosure is assigned to I & C DIRECTORATE case manager[1] who is responsible for the invention through its life cycle.
3. The Case Manager meets with the inventor(s), in order to understand the invention and also to hear which commercialization approach the inventor(s) suggests.
    - Inventor has the option of entering into a Non-disclosure agreement/ Mutual Confidentiality agreement with TTO to safeguard their interests. (Non-disclosure agreement/Confidentiality agreement is attached as appendix 3C.4)
4. The case manager also checks rights and ownership in the invention.
5. The case manager forwards the invention to IPO to perform an evaluation of invention and invention claims with the assistance from ILO as per the following process:

Guidelines for Evaluation of Invention and Invention Claims

- Procure the invention description and its claims. *Is it a "Me Too" technology or a "breakthrough"*
- Understand the scope of each claim and p*urpose of the product/technology*
- Is the idea patentable, c*an the technology be patented?*

[1] DD TTO will act as a case manager until the need arises and more case managers are hired to handle the tech transfer cases

Assist and guide inventor to investigate and search patent data bases to evaluate the patentability of the invention.

- Product Issues

Advantages your idea has over other similar products? Regulatory, safety and environmental issues?

- Skills and Competencies

Are the skills needed to manufacture the product readily available in the industry?

- Initial Funding Capabilities

*Are sufficient funds (internal or external) available to move product to **prototype stage**?*

- Licensing Risks

Several companies qualified as licensing targets? Do they have a good history of working with individuals, institutions or companies of your nature?

- Financial Resources

Does the potential licensee meet the financial needs of manufacturing and marketing the product in production quantities?

6. The case manager then performs the Commercial Potential Assessment with the assistance from ILO.

The Commercial Potential Assessment Guidelines

- Assessing the durable market need of the innovation
- Competitive advantage assessment
    - Product/technology competitive edge
    - Manufacturing economics advantages
    - Is the product unique? Will it function properly for desired duration?

- Economic feasibility of product/technology
- Product cost estimates
    - Cost that market can bear
- Facility Startup Issues
    - A production facility exists? Does it currently use similar raw materials and processes?
- Marketing Risks (Production Stage) New product tie in with your existing products and distribution channels?

System for technology evaluation that suits domestic condition will be followed. (Process for Technology Commercial potential is attached in Appendix 3C.5)

Stage 2 – Technology Transfer Homework

1. If the invention passes stage 1, it moves to stage 2. In this stage I & C DIRECTORATE makes strategic decisions regarding patenting and other legal protection, such as trade marking, as appropriate.
2. In stage 2 I & C DIRECTORATE makes decisions on the following
    - Appropriate IP protection
    - Appropriate commercial approach
3. The case manager works with ILO in order to help identify potential markets.
4. The case manager then performs the Technology Transfer Homework:
        - **Planning:** What do we want to achieve?
        - **Exclusive or non exclusive licensing**
        - **Revenue type**
            - **R&D Administrative Costs:** The fees may be negotiated to cover administrative costs, and are usually assessed up front
            - **Lump-sum or paid-up royalties:** Lump sum payment may be negotiated that must be paid by the licensee up front and not related to sales or business performance. Lump-sum payments may be determined by calculating the net present value of royalties based on projected product sales
            - **Running royalties:** These are royalty payments based on agreed upon formula for sales. Royalties are generally due on a regular schedule and the basis for calculating those amounts may vary, depending on the terms negotiated with the licensees. For example, royalties may be expressed as a percentage of gross or net sales, or adjusted rates after designated levels of sales are reached.

- **Minimum payments:** Certain guaranteed payments may be negotiated as minimum payments generally paid periodically irrespective of sales volume and may be applied against earned royalties

- **Other negotiating issues**
- Duration of the contract
- Markets (National / Regional/ worldwide)
- Performance milestones
- Clause for non-performance
- Licensing to an existing company (Ref Stage 3a)
- Create a new start up (Ref Stage 3b)

Stage 3 – Technology Transfer

3a. Licensing

1. Once the case manager has identified interested potential licensees with the help of ILO, he/she begins the process of negotiating license terms that provide fair return for the inventor and the university, while protecting the rights and ownership for all involved.
2. To set up the meeting for negotiation, case manager personally contacts the other side in writing (mail/email) or by telephone call. Be straight forward and open about the purpose of the contact.

Negotiation – Considerations and Strategy

3. The following is to be discussed and considered during negotiations:
    - The factors and the process to be employed or to be employed for evaluation of technology
    - The Cost of developing marketable product
    - Cost of competitive products at present and if possible in near future
    - The sale price of the product
    - Contribution of technology in competitive positioning of the product in the market
    - Size of the market
    - Review of standard Technology Transfer agreement
    - Review of lessons learned from administration of previous technology transfer agreements paying attention to royalty calculations, royalty payments, right to audit and indemnification clauses

- Confidence and control throughout the negotiations. This comes from knowing the product and product market
- Compromising on demands of insignificant value to achieve major objective. It is a 'GIVE &TAKE' game to reach an agreement
- Knowing negotiation limits, what is most valuable to the business, how much one is willing to give in terms of revenue, discounts, time and other conditions to reach an agreement
- Learning about what value the other team is trying to achieve and what are their key negotiation factors
- Offering certain incentives in place of demands that are not acceptable
- Make known to the other party and reservation about the product, its state of development and its marketability
- Do not rush to close the agreement if you are not satisfied with the terms and conditions
- Exit strategy must be agreed upon by both the parties as a part of the contract

At the conclusion of negotiations and arriving at agreement terms, an authorized representative of TTO will officially send the agreed upon conditions in sufficient details, these will form the legal basis for the negotiated terms. Any amendments proposed by the other party in writing and accepted by in writing, becomes part of the agreement.

4. The agreed upon terms and conditions on the standard Technology Transfer office agreement form duly signed by authorized officials on both sides will constitute the legal document.

3b. Start-up Company

- The possibility of a start up is jointly discussed between the inventor(s) and I & C Dte.

- If it is decided to start a new company then I&C Dte has the following options.
    - Inventors to start a new company
    - Inventors to set up a Joint Venture with STV
    - STV to start a new company
    - If the inventor(s) along with the advice of I&C Dte choose to start their own private venture, they have the option of becoming an incubatee company at Technology Incubation Center.

Start up process

1. Business plan development
    - Executive Summary
    - Market scope, future potential and strategy
    - Competitive advantage of technology or product
    - Manufacturing strategy
    - Sales, distribution and after sale service strategy
    - Human Resources (Management team and skilled workforce)
    - Capital resources needed
    - Cash flow and P&L projections

2. Business plan review and approval by TIC Advisory Committee (Details are in TIC Policy)
3. Funds allocation
4. Product prototype or formulation finalization
5. Functional product development
6. Reliability and performance verification

7. Final design refinements

8. Production and assembly line architecture and process design and system layout

9. Plant construction, machinery procurement, installation and trial production

10. Commercial production

Stage 4 – Administration of License Contract

1. The TTO maintains intellectual property protection and administers the licensee's performance to ensure that it is aligned with the agreement.
    - Determines what system is used to record information relating to reported technologies including the title of the invention, a unique invention or case number, the names of inventors and their percentages
    - Determines if a standard checklist or other mechanism is utilized to ensure that internal documentation requirements relating to new license agreements are met
    - Monitors if standard billings are sent to licensees on a regular basis to promote compliance with reporting and payment requirements
    - On a test basis, verifies the calculation of royalty and other payments to the institution based on rates and milestones achieved as defined in the license agreement
    - Verifies that royalty distributions to inventors, institutional departments, and sponsors are consistently calculated and paid in accordance with established policies
    - Determines that processes have been implemented for recording, monitoring, and recovering legal and administrative expenses, including the consistent application of formulas for calculating expense allocations, and the generation of timely expense billings
    - Determines whether the office performs periodic royalty examinations of licensees records, and assess the frequency, scope, and the results of such examinations
    - Verifies that financial records maintained by the licensee are periodically reconciled to the TTO general ledger and that discrepancies are resolved in a timely manner.

Appendix 3C.1: Term Sheet

Term Sheet

Subject:	
Introduction:	
Patent Rights	
Proprietorship on Manufacturing and Marketing	
Technology Transfer	
Responsibilities of parties	
Licensing Conditions	
Royalty Rate	

Financial Obligations	
Audit and Records	
Validation	
License Exclusivity	
Termination	

_____ _____

For and on behalf of _____ For and on behalf of _____

Name:_____ **Name:** _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

NIC: _____ **NIC:** _____

Appendix 3C.2: Licensing Agreement

Licensing Agreement	
01:	**Introduction :**
02:	**Definition:**
03:	**Grant :**
04:	**Royalties :**
05:	**Representations and Warranties :**

06:	**Term and Termination:**
07:	**Assignment and Transfer :**
08:	**Miscellaneous Terms:**

_____ _____

For and on behalf of _____ For and on behalf of _____

Name:_____ **Name:** _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

NIC: _____ **NIC:** _____

Appendix 3C.3: Invention Disclosure Form

Confidential

Disclosure

no: Status:

Invention Disclosure Form

NUST

Name:

Work phone numbers

Fax numbers

1. Proposed Title:

a.	

2. Field Of Invention

a.	This invention relates primarily to:

3. Background And Related Art:

a.	The technical problem addressed by the invention is as follows:
b.	The closest related art is described as follows:
c.	Advantages presented by the invention are as follows:

4. Drawing (s):

a.	Drawings for this invention are: available/not available. If available, please attach.
	Comments about drawings provided:

5. Written Description:

	The invention is described as follows: **NOTE 1: Please attach additional pages as necessary.** **NOTE 2: If you have other documents and /or drawings related to the invention, please attach copies to this form.**

6. Conception of Invention:

a.	Date of conception:
b.	Date of first written description:

7. Reduction to Practice:

a.	Has the invention been reduced to practice?
b.	Comments, if any, on conception of invention and/or first written description:

8. Technical field and category of the technology:

a.	This invention relates primarily to:					
b.	Category:					
Biotechnology:		Chemistry:		Product/improvement:		

9. Inventor (s):

Inventor {1}:

a.	Name:
b.	Residence address:
c.	Contact information: Cell: Off ph: Email:
d.	Contractual status:

Inventor {2}: Note: Add more if required:

10.

a.	Name:
b.	Residence address:
c.	Citizenship:
d.	**Comments:**

11. Dates or Product Testing and Release:

a.	Alpha testing:
b.	Beta testing:
c.	General release or sale:
d.	Offers for sale:

e.	**COMMENTS** on product testing and release:

12. Disclosure of Invention:

a.	Has there been any disclosure or use of the invention by the public?
b.	When and to whom?
c.	Under a non-disclosure agreement?
d.	Please attach a copy of disclosure.

13. Internal Disclosure (s):

a.	First internal disclosure date:
b.	Name of first person to whom invention was disclosed:
c.	**COMMENTS** about first internal disclosure:

14. Article (s):

a.	Have any articles been published?
b.	Details about publication of articles (s)
c.	**Please attach a copy of the publication article.**

15. Advertisements, Press Releases and Product Announcements:

a.	Any ads, press release or product announcements?
b.	**Please attach a copies of ads, press releases and/or product announcement :**

16. Outside Disclosure (s):

a.	Have there been any disclosures outside of NUST?
b.	Were all outside disclosures under a non disclosure agreement?
c.	Detail about any disclosure outside the NUST:
d.	**Please attaché copies of the information disclosed.**

15: Trade Shows and Conferences:

a.	Are there any upcoming trade shows or conferences where disclosure may be?
b.	Details about upcoming trade shows and/ or conferences in above regard:

Additional Comments by Inventor:

a.	

Signed: Witnessed and understood by:

_____ _____

Date; _____ Date: _____

Appendix 3C.4: Non Disclosure Agreement (Sample)

NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY

This agreement is entered into this ___ day of _____, 20____between _____ (Recipient) and _____(Discloser), with offices at _____.

WHEREAS Discloser possesses certain ideas and information relating to _____ that is confidential and proprietary to the Discloser (hereinafter "Confidential Information"); and WHEREAS the Recipient is willing to receive disclosure of the Confidential Information pursuant to the terms of this agreement for the purpose of _____; NOW THEREFORE, in consideration for the mutual undertakings of the Discloser and the Recipient under this agreement, the parties agree to the below terms as follows:

1. Disclosure. The Discloser agrees to disclose, and the Receiver agrees to receive the Confidential Information.

2. Confidentiality.

   2.1 *No Use*. The Recipient agrees not to use the Confidential Information in any way or manufacture or test any product embodying Confidential Information, except for the purpose authorized by the Discloser.

   2.2 *No Disclosure*. The Recipient agrees to use its best efforts to prevent and protect the Confidential Information, or any part thereof, from disclosure to any person other than the Recipient's

employees that have a need for disclosure in connection with the Recipient's authorized use of the Confidential Information.

2.3 *Protection of Secrecy*. The Recipient agrees to take all steps reasonably necessary to protect the secrecy of the Confidential Information and to prevent the Confidential Information from falling into the public domain or into the possession of unauthorized persons.

3. Limits on Confidential Information. Confidential Information shall not be deemed proprietary, and the Recipient shall have no obligation with respect to such information where the information:

   (a) Was known to the Recipient prior to receiving any of the Confidential Information from the Discloser;

   (b) Has become publicly known through no wrongful act of the Recipient;

   (c) Was received by the Recipient without breach of this agreement from a third party without restriction as to the use and disclosure of the information;

   (d) Was independently developed by the Recipient without use of the Confidential Information; or

   (e) Was ordered to be publicly released by the requirement of a government agency.

4. Ownership of Confidential Information. The Recipient agrees that all Confidential Information shall remain the property of Discloser and that the Discloser may use such Confidential Information for any purpose without obligation to Recipient. Nothing contained herein shall be construed as granting or implying to the Recipient any transfer of rights, any patents, or any other intellectual property pertaining to the Confidential Information.

5. Term and Termination. The obligations of this agreement shall be continuing until the Confidential Information disclosed to the Recipient is no longer confidential.

6. Survival of Rights and Obligations. This agreement shall be binding upon, inure to the benefit of, and be enforceable by (a) the Discloser, its successors and assignees; and (b) the Recipient, its successors and assignees.

IN WITNESS WHEREOF, the parties have executed this agreement effective as of the date first written above.

Discloser (Name of the Discloser)	**Recipient (Name of the Recipient)**
Signed	Signed
Name	PrintName
Title	Title
Date	Date

Appendix 3C.5: Process for Determining Technology Commercial Potential

- Inventors almost always overestimate and so I&C Directorate will check and conclude the realistic findings out of overestimations

- I&C Directorate will take decision in consultation with TIC Advisory Committee based on following:

    1) Firstly to assess the durable market need of the innovation;

    2) Secondly to assess the durable competitive advantage of the technology in subject to similar technologies being developed or already developed;

    3) Thirdly to assess the potential bottom line main market share of 10%;

    4) Fourthly to assess the time period for this market gain; and

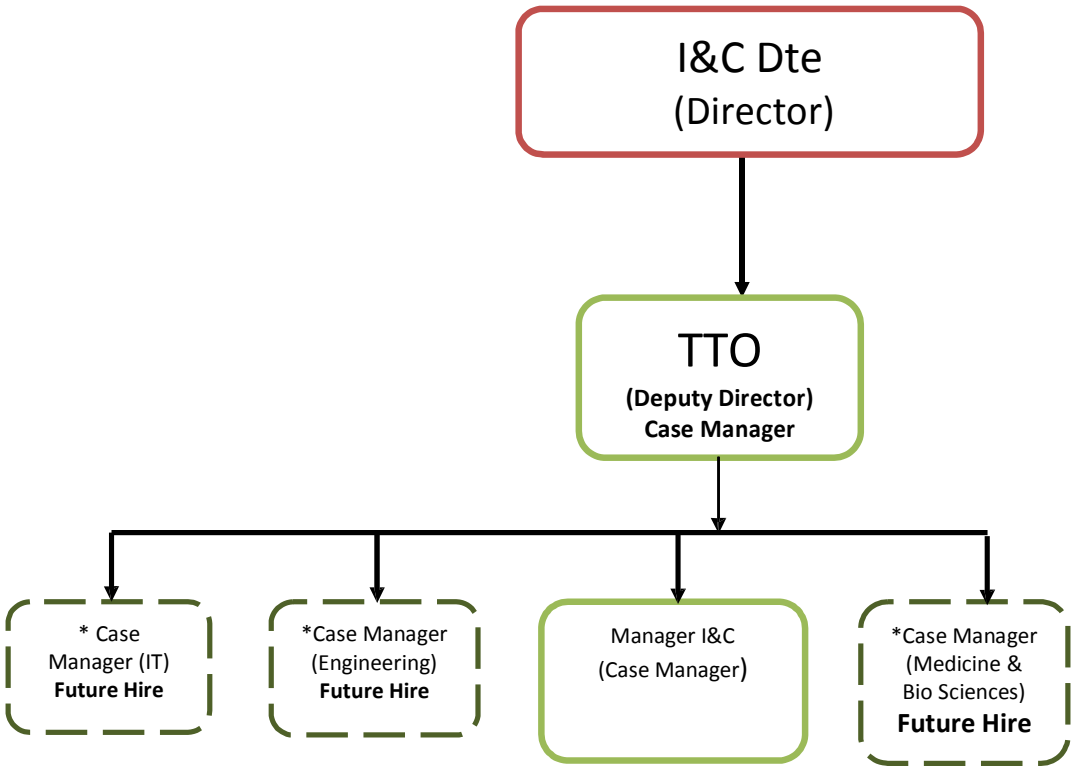
    5) And finally to assess the realistic sales estimate/licensing revenues for outside the region.

No progression to a positive decision if there is a 'NO' in answer to each of the above mentioned five stages decision making sequence

At stage two of decision making technical, economic and non-technical and non economic purchasing criteria will be considered

For the purpose market segmentation will be done and then the new technology will be compared for each purchasing criteria mentioned above.

Appendix 3D: Structure of TTO Directorate (with case managers)



*** These positions to be hired in the future when volume of work increases where above mentioned focus areas licensing expertise may be required**

Appendix 3E Best Innovation Award

Best Innovation Award (criterion is being prepared)

Associated References

S.No	Title	Reference	Dated
1	NUST Intellectual Property (IP) Policy	Working Paper No 6, 12th ECM	29th November 2011
2	Policy document for Operations and Management of NUST Technology Incubation Center	Working Paper No 7, 12th ECM	29th November 2011
3	Performance Evaluation of NUST Faculty	Working Paper No 20, 34th ACM	30th May, 2011
4	Tenure Track System	Working Paper No 09, 16th BOG	3rd Feb, 2012
5	Criteria for Appointment / Promotion of NUST Faculty	e-ION No 27548	10th Feb 2012
6	Policy on Faculty Load	Working Paper No. 30, 32nd ACM	24th Feb, 2010
7	HEC Letter regarding patents equivalence to publications	DG/QA/HEC/Policy December/2008/1140	4th Nov, 2008