

## **CONCEPT PAPER**

### **NUTECH-INDUSTRY JOINT COLLABORATION FORUMS (NIJCF)**

#### **Background**

1. National University of Technology (NUTECH) is established as pioneer national technology 'University for Industry' to create, develop, implement and promote existing, emerging and future technologies and allied skills for our national industry. The university is primarily established to revive our national industry through applied research, projects, consultancies and voluntary intellectual, academic and professional services to the national industry. To develop national industry 'System Approach' for NUTECH-Industry collaboration is essential so as to make such relationship permanent feature of NUTECH academics, research and support systems. As part of its efforts to develop such system of industry support on permanent basis, the university has created various NUTECH-Industry forums which are designed to act as relevant platforms for the solution of all industry based and technology driven issues ranging from industry policies to technology research projects, industry labs development, technical advising and industry-needed technical and vocational skills.

#### **Concept of NUTECH-Industry Forum (NIF)**

2. The concept envisages assembly of relevant industry leaders, professionals, entrepreneurs and experts alongwith relevant academic and research experts of NUTECH faculty, relevant expert representatives of concerned national scientific R&D organizations and public sector entities operating under the umbrella of Ministries of Science & Technology, Commerce, Industries and Planning etc. NUTECH Office of Research Industrialization, Internationalization and Commercialization (NORIIC) is the pivot, which will act as coordination, steering and management office of all related activities of relevant forums. The concerned forums are envisaged to work on focussed aspects / issues derived specifically from the feedback / input of the national industry/ allied industrial estates on the basis of their technical needs as envisaged in the original plan. All NUTECH-Industry forums are designed to act as part/ components of comprehensive system to address issues, challenges and problems of industry within their mandate in an organized, methodical, efficient and effective manner. The concept allows specific platforms to work for the resolution of industry problems from policies to skills related to technological up-gradations, imports substitutions, value-added products development, exports enhancement and skills development, enhancement and optimization etc. The concept is conceived to promote an active involvement, participation and significant contribution of all members representing industry associations, chambers etc, through continuous valuable technical inputs which will be utilized by the academic and technical

experts of NUTECH to produce solutions for the problems of industry ranging from technologies creation, development, implementation, promotion etc to hi-tech, medium tech and low-tech skills development, enhancement and promotion as per national and international industry standards. All the prescribed forums will work proactively to generate solutions for industry in relevant domains through the work/ endeavours of NUTECH experts.

### **Design of NUTECH-Industry Forums (NIF)**

3. NUTECH has motto of voluntary service to the national industry intellectually, academically and professionally for its revival, establishment and development as value-added exports driven industrial enterprise of the future. The fundamental design envisages establishment of relevant platforms to address issues of industry policies, development, technology, skills, industrial labs, industrial processes improvement and quality enhancement of industrial products. The cardinal principles for industry success behind the design of NUTECH-Industry forums are envisaged to be the following:-

- a. Design, development and manufacture of top quality world-class industry products.
- b. Innovative industry products development in “Minimum Time”.
- c. Design, development and manufacturing at most Economical Costs.

4. The design of NIF is flexible and the forums suggested in this document are anticipated to address the challenges of above stated cardinal principles for success of industry in terms of top quality design, development and manufacturing, innovative products development in minimum time and in the most economical costs. The flexibility in NIF design allows future expansions in each forum in terms of members/ participants from industry, scientific R&D Organizations, relevant development support and regulatory bodies of Govt, national and international academia, intellectuals, professionals and relevant experts etc. Apart from this, provision is being made to introduce need-based new forums under the umbrella of NIF in future.

### **Brief Description of NUTECH-Industry Forums (NIF)**

5. To begin with, NUTECH has envisaged establishment of FIVE (05) different NIFs intended to cater for the needs of industry in particular domains through a strong and sustainable system of University-Industry partnership. The different forums and their envisaged role, functions and anticipated outcomes are briefly explained below:-

- a. **NUTECH-Industry Policies Forum (NIPF)**. For the growth of any industry, it is imperative that the Govt should devise visionary, long-term and industry-friendly policies which should accelerate the growth and development of national and local industry substantially. In all over the advanced

industrialized world, the visionary policies of Govts are actually crafted by leading Universities, which act as “Think-Tank”, bridging the gap between Govt and Industry. NIPF will have representation/ nominations from industry chambers, industrial estate associations, industry sector associations and other relevant national industry forums. NIPF will have honorary representation from Govt institutions representing Ministry of Commerce, Ministry of Industries and Ministry of Planning, Development & Reforms. NIPF will act as intellectual, academic and professional “Think-Tank” of Govt & Industry. The industry nominees will be called as “Members Industry Policy”, who are notified for a period of ‘THREE YEARS’ by NUTECH. NUTECH will manage NIPF through NORIIC, which will be assisted by selected individuals, experts from within and outside NUTECH, as deemed necessary on requirement basis. NIPF will extensively work on crafting draft Govt policies for national industry exclusively based on the following two fundamental guiding principles:-

- (1) ‘Imports Substitution’ and ‘Value-added Exports Enhancement’.
- (2) ‘Technologies Up-gradation’ and ‘Hi-tech’ finished products development.

- b. **NUTECH-Industry Technology Development Forum (NITDF)**. To make our national industry become competitive in value-added products based exports markets around the world, it is imperative to develop corresponding technologies for our industry. It is more important in the face of upcoming 4<sup>th</sup> Industrial Revolution (Industry 4.0) when overseas markets are expected to witness stiffer competition than ever among major exporters; especially those with clear edge in terms of superior quality, more economical products will likely dominate in terms of exports earnings. NITDF has nominees from industry associations and chambers as ‘Members Technology and Advising’ who are expected to be major contributors in terms of inputs from industry, different industry sectors and enterprises. All the industry members technology and skills, will generate authentic industry data about the types and use of technologies at the various industrial sectors and major industries in Pakistan. On the basis of critical inputs from industry, NUTECH experts at NITDF will conduct research studies, feasibility projects and technology development projects to design and develop technology up-gradation plans for different industries. NITDF will connect industries with different technologies based research and product development projects to make our

industry technology driven exports enabled enterprises in future. The members from industry will prioritize their respective industry sectors for technology up-gradation and development. In addition they will become part of advising system involving engagement of NUTECH faculty experts, scientists, researchers and technology experts of national scientific and R&D Organizations for joint research collaboration projects to develop industry products. NITDF will have representation from industry, different Govt institutions of Ministries of Commerce, Industry and Science & Technology. It is in addition to the reasonably large number of NUTECH PhD faculty who will join NITDF as consultants, guides, academic and intellectual partners for the R&D based solutions of technology and industry through technology up-gradation projects. NITDF is anticipated to play significant role as platform overseeing technology development research through NUTECH as follows:-

- (1) Coordination forum for integration of technology development research at NUTECH, national scientific R&D organizations and concerned industries/ associations.
- (2) Develop joint NUTECH-Scientific R&D Organizations-Industry technology development research groups for focused research on technologies for exports enhancement and value-addition of manufacturing products.
- (3) Industry and prepare Technology Development Projects (TDP) list for necessary R&D on biennial (2-year) basis to develop industry through NUTECH.
- (4) Initiate R&D projects to develop technologies for considerable reduction in the cost of manufacturing.
- (5) Initiate R&D projects for considerable energy conservation and savings to considerably cost of manufacturing.
- (6) Facilitate R&D and technology development collaborations of NUTECH experts with international industry companies for establishment of Labs and Product Development Centres (PDCs) for national industry.
- (7) Will work to develop existing technologies presently not available through prioritizing the pressing requirements of industry.
- (8) Create consortia of large and medium industrial enterprises of particular industry sectors for planning technology development

projects to enable them becoming export industries of high quality finished products.

- (9) Align NUTECH academic and research programs, projects and support systems with the technology development needs of different sectors of industry.
- (10) Make NUTECH intellectual partner of industry for developing new industrial projects, at newly established economic zones for transformation into Special Knowledge-Economic Zones (SKEZ) in the country.
- (11) Identify and prepare plans to up-grade industrial sectors in terms of technologies of 4<sup>th</sup> Industrial Revolution (Industry 4.0).
- (12) Integrate industry with disruptive Technologies and Skills Park (DTSP) at NUTECH to promote indigenous technology solutions for industry.

c. **NUTECH-Industry Labs & Projects Forums (NILPF)**. To develop national industry so as to let it compete with global industry, it is extremely essential that our national industry is well conversant with the international industry standards for high quality exports driven products. The forum will have representation from NUTECH faculty experts, relevant experts from national scientific organizations dealing with national standards for industry, representations from national academic, scientific, industrial and commercial products development labs, industry research organizations, institutions of Ministries of Industry, Science & Technology and Commerce. The forum will perform following functions:-

- (1) Develop credible data base of all types of industrial testing and quality assurance labs at different sectors of industry/ major industries in the country.
- (2) Carry out detailed conformance mapping of testing and quality control lab practices with those of international standards for exports based industrial products development.
- (3) Alignment of national scientific, research and industrial support labs with the actual needs of industry for improvement of quality of products and compliance with industry standards.
- (4) Organize, conduct and manage professional trainings for industry professionals and technical workforce on latest industry products

testing and quality assurance equipment at national scientific, research and higher academic institutions.

- (5) Identify industrial instrumentation measuring and testing equipment, test benches and quality control gadgetry for their subsequent indigenous development as NUTECH faculty and students projects.
- (6) Develop mechanism of collaboration and integration of local and national level labs of Universities, research institutions and industry for an active support to industry in terms of quality improvement of industry products and facilitation towards their compliance with international export quality standards.
- (7) Identify technical problems/ issues of industry as potential projects for NUTECH with clearly specified duration of six months to one year and their resolution by experts, researchers and students of NUTECH.
- (8) Prepare lists of urgently required development/ up-gradation of critically vital lab facilities for different industrial sectors in the country in order to plan establishment of central facility(s) for an active support to industry in improving their products through conformance to international standards.

d. **NUTECH-Industry Skills Development Forum (NISDF)**. The national industry direly needs highly competent, efficient and productive industrial workforce equipped with all the necessary tools of conventional and hi-tech skills. The skills are required to implement existing and upcoming technologies in the industry in an efficient and effective manner. NISDF will have membership of NUTECH skills experts, master trainers of hi-tech skills, representatives of NAVTTC and experts from faculty with specialization in innovative hi-tech skills of 4<sup>th</sup> Industrial Revolution (Industry 4.0). NISDF will have multiple tasks to perform including the following:-

- (1) Will develop credible database of required industrial skills sets and competency standards needed in the different industrial sectors.
- (2) Will design an effective and efficient system of skills trainings in the conventional and hi-tech domains to address the pressing needs of industry.
- (3) Will generate credible inputs from industry in the form of desired types of skills required in industry of selected sectors to facilitate NUTECH develop necessary curricula and skills education courses on the lines of best international TVET models.

- (4) Will oversee skills trainings at the industry sponsored technical and vocational training institutes at different industrial regions in the country.
  - (5) Will work to develop proper service structure for highly qualified and skilled industrial workforce trained in appropriate industry skills.
  - (6) Will facilitate NUTECH develop skills standards compatible and in conformance with the needs of industry in terms of productivity and quality enhancement.
  - (7) Will align NUTECH skills education with the exact needs of industry.
  - (8) Will suggest specialized certifications and diploma courses for youth at NUTECH and affiliated institutes to develop industrial processes with enhanced economy of resources and time.
- e. **NUTECH-Industry Coordination Forum (NICF)**. Being 'University for Industry' and with sole purpose of serving the industry in the most proficient and effective manner, it is imperative for NUTECH to establish very strong relationship with industry and become their intellectual, academic and professional partner. In this context NUTECH leadership intends to develop NICF for establishing long-term professional links with industry and make all necessary coordination to serve the interests of industry in the best possible manner. NICF will be managed by NORIIC, where apart from industry focal persons as members, there will be nominations/ representations from organizations of Ministries of Science & Technology, Education & Professional Training, Commerce, Planning and Industries supported by the relevant leadership of NUTECH. NICF will perform following functions:-
- (1) All types of intellectual, academic and professional liaison with the representative industry chambers, associations and other organizations/ institutions.
  - (2) Will work to design an effective system of integration of NUTECH-Industry partnerships for supporting industry sponsored national initiatives of strategic infrastructure.
  - (3) Will work to faster strong linkages of different industry sectors and vital industries with NUTECH, national scientific R&D Organizations and elite academic institutions to facilitate growth and development of industry.

- (4) Will organize joint NUTECH-Industry Conferences, Seminars, Symposia, Workshops, meetings with different industry sectors and organizations on focused themes and objectives.
- (5) Will work to have reasonable representation of NUTECH at different consultative and decision-making forums of industry as honorary memberships or with 'Observer' status.
- (6) Will facilitate all existing NUTECH-Industry collaboration forums for their smooth functioning and attainment of specified Objectives.
- (7) Will act as decision-making forum in case of emergence of any requirement to create a new NUTECH-Industry forum in future.
- (8) Will work to expand the mandate of any one or all NUTECH-Industry forums on as and when required basis.
- (9) Will prepare and maintain central database of all industries, industry sectors, local and regional chapters of industry associations, chambers and similar organizations associated with NUTECH.
- (10) Will take all necessary steps to develop NUTECH-Industry relationship for the best interest of the national industry and economy.

### **Conclusion**

6. NUTECH is the first national technology University created specifically to serve national industry on the lines of best international practices of world's leading universities. Through the creation of NUTECH-Industry Joint Collaboration Forums (NIJCF) NUTECH has laid the foundation of system of national industrial development for an economically strong and prosperous Pakistan. NIJCF will create a unique University-Industry-Govt linkage based triple helix model in the country which will become beacon of enlightenment for other higher education institutions to emulate and follow in future.