Indian Institute of Science

CENTRE FOR SOCIETY AND POLICY

WORKING PAPER SERIES

Policy Review: National Design Policy of India, 2007 and Science, Technology and Innovation Policy of India, 2013

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Working Paper 06A/10/2019

POLICY REVIEW: NATIONAL DESIGN POLICY OF INDIA, 2007 AND SCIENCE, TECHNOLOGY AND INNOVATION POLICY OF INDIA, 2013

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1. Introduction

The word design is used to refer to design solutions, design activity, design stage, and the domain itself. It is used as a noun and a verb. *"Design is to design a design to produce a design."*– is a line often used to show the shifts of its meaning [1]. Design cuts across various domains, while materialising as products, processes, and services. Heskett [1] categories design into five classes – Objects, Communication, Systems, Environment, and Identities[1]. Digital products, processes and services are 'designed' too. The broad categories of design are listed below:

1. Design of artefacts – engineering design, product design, industrial design, packaging design, arts & crafts, fashion design
2. Design for environment – architecture, interior design, landscape design, urban design
3. Design for communication and interaction – graphic design, interaction design, information design, user interface design, signage design
4. Design of digital products – software architecture, information architecture, user interface/interaction design
5. Design of systems – urban planning, railway/metro rail and road networks, electricity/water supply networks
6. Design of identities – branding design, logo design, typography, national identities
7. Design of services – business models for services, delivery of products as services
8. Design of processes – process design in factories, hospitals, hotel & food industry

All of the above categories of design are creative processes, and design as a methodology (also termed design thinking) is applied to arrive at solutions. Such application when it is culturally imbibed in organisations, or in other words when it is habituated as a routine activity, creates an environment for innovations. Innovations are those designs which are new, unique and provide more value to the user than the rest of the designs which meet the same requirements. Innovation is a *"new idea, creative thoughts, new imaginations in form of device or method"* [2]. Like design, innovation also refers to the object as well as the activity. An innovation in design refers to novel design solutions which does not exist, hence creating intellectual assets.

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This Policy brief aims to show the need for a holistic view of design and innovation in policy making and the need to understand the role of design in creating new businesses and wealth for the social and economic development of India. lndia's National Design Policy 2007 [3] and Science, Technology and Innovation Policy 2013 [4] is analysed here to show the lack of a holistic view or understanding of the role of design in achieving the goals of these policies.

2. Salient Points

2.1. National Design Policy, 2007

The National Design Policy (NDP) of India, 2007 was framed by the Department of Industrial Policy and Promotion (DIPP) (now Department for Promotion of Industry and Internal Trade), under the Ministry of Commerce and Industry. An Action Plan for the policy was drawn up by a Committee of representatives of various Ministries and Departments with the Director of National Institute of Design (NID), Ahmedabad as Member Secretary [5]. NID is an autonomous body under DIPP. The process of developing the National Design Policy was started after the Government of India realised the increasing importance of design in economic, industrial and societal development as well as in improving quality of products and services [3].

The National Design Policy states its vision as:

"Strategic role of design for national and industrial competitiveness is now universally recognized. Value addition through innovations in designs can play a pivotal role in enhancing the competitiveness of both manufacturing and service industries." [3].

The methods to achieve its vision are stated as:

"Strengthening quality design education at different levels, encouraging use of designs by small scale and cottage industries and crafts, facilitating active involvement of industry and designers in the development of the design profession, branding and positioning of Indian design within India and overseas, enhancing design and design service exports, and creating an enabling environment that recognizes and rewards original designs." [3].

The key recommendations of the committee were [3]:

1. *Constitution of the Design Council of India*
2. *Form a Chartered Society of Designers.*
3. *Form a Working Group for new Institutes of Design and strengthening of Design Education in Existing Institutions.*
4. *To conduct Design Awareness Programmes*

2.2. Science Technology and Innovation Policy of India, 2013

The Science Technology and Innovation (STI) Policy was drafted by the Department of Science & Technology under the Ministry of Science and Technology in 2013.

The STI Policy was framed after the Indian Science Congress of 2010, where the Prime Minister declared 2010-20 as the 'decade of innovations', and announced to bring forth a policy that builds synergy between science, technology and innovation [4, 6]. The STI policy aims to bring fresh perspectives on innovation, and to focus on 'people for science' and 'science for people' [4].

The STI policy aims for the national STI enterprises to earn a central place in national development and STI is recognized as a major driver for socio-economic development. The STI policy points the need to deliver solutions by STI systems to address the national challenges in the areas of energy and food security, nutrition, affordable health care, environment, water and sanitation. It stresses on employment as a national challenge. Therefore, 'Science and Technology for People' is coined as the new paradigm for India's STI enterprise.

The key elements of STI Policy are [4]:

1. *Promoting proliferation of scientific temper amongst all sections of society*
2. *Enhancing skill for applications of science among the young from all social strata*
3. *Making careers in science, research and innovation attractive to the brightest*
4. *Establishing world class R&D infrastructure for gaining global leadership in some select frontier areas of science.*
5. *Positioning India among the top five global scientific powers by 2020.*
6. *Linking contributions of science, research and innovation system with inclusive economic growth agenda and combine priorities of excellence with relevance.*
7. *Migrating R&D outputs into commercial applications by replicating hitherto successful models as well as establishment of new structures.*
8. *Facilitating S&T based high-risk innovations through new mechanisms.*
9. *Triggering changes in the mindset and value systems to recognize, respect and reward performance.*

India's first national policy in Science was in place in 1958, as India's Scientific Policy Resolution [4]. It aimed to cultivate science and scientific research and many scientific research institutions (CSIR labs, IITs, Engineering institutes) were established after that. After decades of technology import through foreign partnerships with public sector companies, the Technology Policy Statement of 1983 came into being which emphasized the need to attain technological competence. This was after the Indian manufacturing industry got stagnated with old imported technology that continued to be produced in India. Technology got attached to Scientific policy as late as in 2003 as Science and Technology Policy. It aimed at investment into R&D for addressing national problems and integrating socio-economic sectors [4]. It emphasized the need for technological innovation and creation of a national innovation system [4]. Following this, innovation was recognised as an important dimension for meeting the developmental goals, and thus the STI policy was framed [4].

3. Role of Design in the Two Policies – The Gaps

Both National Design Policy and STI policy have social and economic development of India as their eventual goals. But both its vision to achieve them are different, and both perceive design differently. Design must be perceived in a common understanding in its broad sense to bridge this chasm.

3.1. Science Technology and Innovation Policy

It is the first time, 'innovation' was attached to S&T policy in 2013, after it evolved over seven decades. The STI policy defines innovation as,

"Innovation is more than mere conversion of knowledge into a workable technology. It implies an S&T-led solution that is successfully deployed in the economy or society." [4].

Innovation is referred to as 'S&T-led solution' which is in fact a design solution. The policy also calls for this 'solution' to be 'deployed in the economy or society' successfully. This is certainly the domain of design where the products, processes, or services, are designed for the society that creates new businesses benefitting the economy. The paradigm of STI Policy is 'Science and Technology for People', and achieving this is not possible without design. Yet, the STI policy document does not have the word 'design' occurring in it even once. The policy refers to it without taking its name at many places. The keywords in the STI policy listed below points to that:

"Migrating R&D outputs into commercial applications", "S&T based high risk innovations", "create wealth from S&T derived knowledge", "science and technology for the people", "take science to people and people for science", "enhancing skill for application of science", "bridging gaps between knowledge and the economic sectors", "science-led technology and innovation", "discovery and solution dimensions of science and technology", "deliver solutions to address the pressing national challenges" [4].

In short, the above phrases are calling for taking science and technology to people, through 'solutions' that address India's national challenges, and make that process of 'providing solutions' economically beneficial for businesses, which in turn would lead to socio-economic development. Economic because new businesses established in the country providing 'solutions' that are in huge demand; social because it eliminates the national challenges like energy, food, unemployment etc. These 'solutions' are nothing but products (or designs) that need to be designed.

Look at another sentence from the STI policy,

"Science, research and innovation can exist separately on their own in disconnected spaces. But there are synergistic linkages……Innovative structural mechanisms and models will thus need to be evolved to balance the priorities and develop interconnections of the three sectors." [4].

It considers science, research and innovation as 'three sectors' as if these existed (or exist) separately in reality. The notion itself that these are disparate 'sectors' that need to be interconnected is what needs to be addressed. Design is the missing reference here. Science is discovery of a phenomenon or a new understanding; and technology is practical application of scientific knowledge. The translation of science to technology if done through design (engineering design activity), it can be a product that meets certain specifications or requirements with a business potential by itself. Design (activity) is also about converting technology to a product, process, system or service to be used by an end-user(s) or people. Businesses sell designs (products, processes or services) and create wealth.

For example, how is internet beneficial to people? It is beneficial to an individual, when he/she has a mobile device, or a PC, and has subscribed to an internet service – or in another words, it reaches people. These are products (mobile phones, PCs, modems, mobile towers) or systems (the cable network, Wi-Fi network) that were designed to take internet technology to society. People do not buy technology because it is an 'innovation', they buy products or services that are useful for them and improve their lives. Design (as a process) is what interfaces with society, understands a need, and provides a design (solution) that creates value.

The omission of Design and its co-existence in Science, Technology, and Innovation is a drawback of this policy. It is a not a 'sector' but an inherent activity (or a method) that is essential to meet the goals of the policy. Design process can happen at one place, in one laboratory, or at separate places through collaborative design. Using design as a method (or thinking process), is a culture that needs to be developed in S&T organisations in India and to make this happen a long-term plan is essential for cultural change, training, and awareness.
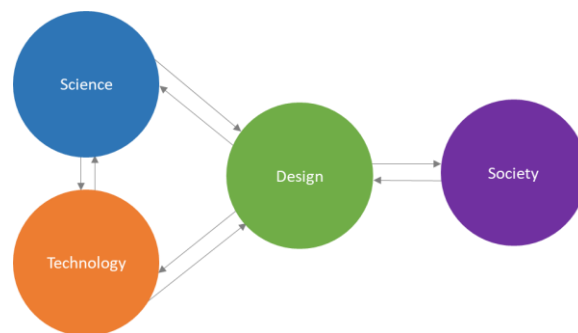

Figure 1. Co-existence of Design in Science and Technology for value creation to society.

3.2. National Design Policy

The National Design Policy, though does not define design in the document, it uses it mostly to refer to industrial design and styling, arts & crafts design, traditional Indian crafts, or branding design. It uses the word design mostly referring to the 'artefact', or as an industrial design activity. The following phrases from the policy document hint on that:

"Encouraging use of design by small scale and cottage industries and crafts", "enhancing design and design service exports", "recognises and rewards original designs", "promotion

of Indian design", "Design...providing competitive edge to products and services", "Design and brand driven value chain and Intellectual property development including design registrations...", "India...leading influencer of global design, especially Asian design", "...make India major hub for exports and outsourcing of designs" [3].

In the National Design Policy document, what demonstrates the connotation of design more is, not the above listed phrases, but the lack of two words – science and technology. The word 'science' does not exist in the policy document, and 'technology' appears only twice, where in both cases, while referring to the need for 'access to technology' to manufacture designs.

*"One key strategy of India's National Design Policy is to develop strategic alliances with design firms, institutions, associations and governments abroad. Developing strategic alliances enhances the long-term competitive advantage of a firm by helping companies leverage critical capabilities, increase innovation, **acquire access to technology** and know-how and increase flexibility in responding to market and technological changes."* [3].

*"Enable the designers in India to have **access to** global trends and market intelligence and **technology tools** for product development and innovations."* [3].

The above quotes from the policy documents demonstrate how technology and design are perceived as differently. The call for 'access to technology' shows the legacy practice of importing technologies to India, whereas the focus of a national design policy should be on 'creating new technologies' itself through design.

The main drawback of this policy is, design is seen as a differentiator for products, which hints at an industrial design activity. Though this is very important, the NDP as a national policy on design takes a narrow definition of design.

4. How Design Can Play an Important Role in the Two Policies? – Bridging the Gap

To achieve the goals of social and economic development and to address the national challenges of India, design needs to be incorporated in Science, Technology and Innovation policy and in National Design Policy in its broad definition. A joint policy across ministries of Science and Technology, Commerce and Industry, and HRD can be drafted to achieve developmental goals through science, technology and a design-led economy.

The connotation of the word design needs to be understood in its broad definition by policymakers and organisations in order to frame better policies. Munshi [7] in early 1990s also raised the need for including design in India's science and technology policy to achieve its goals. After 23 years, design is still not part of STI policy. Incorporating 'design' in STI policy, and can help improve the feasibility of its goals. If you ask how and who can create innovations, when there are no innovation schools in India, implementing the policy goals look distant. But, if you realise these are design goals, then we have a pool of design and engineering graduates who can work in such design roles.
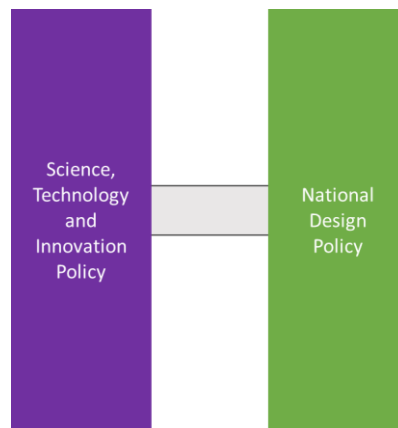
Figure 2. Bridging the gap between STI Policy and NDP

Design in innovation Strategy of the UK, explicitly states design as a methodology that can be applied in the creation of better products, services, processes and business models. The UK's design economy contributes £ 72 billion and makes 7.2% of their total Gross Value Added (GVA is the measure of the value of goods and services produced in an area) [8].It employs 1.6 million people, among these 580,000 works in the 72,340 design industry firms in the UK, with another 1 million employed in design roles across other sectors [8]. This shows the scale of economy that can be achieved through incorporating design as a methodology and the employment opportunities design can generate in non-design firms.

One of the activities of the National Design Policy is to standardise the design syllabi for all institutions in India. Design is an activity that is required in many diverse sectors and industries. The diversity in design education is therefore a necessity in order to have designers who can work in different sectors, from aviation, automobile, consumer good, architecture, and arts and crafts, etc. The policy also recommends a Chartered Society for Designers for registration of design professionals. Design as a specialist profession might be an idealistic solution, but in the context of India with 1.3 billion population [9], we would need many millions of designers to cater to the national challenges the STI policy aims to address. The UK with 5% of India's population (66 million) [10] has 1.6 million people working in design related roles [8]. India has only perhaps 30-40 design schools [11] and those schools alone cannot create the number of designers needed for our country. To tackle the lack of designers, India must leverage its large pool of engineering graduates by giving them training in design during engineering education, and as post-engineering finishing school courses. In the last six years, around 0.6-0.7 million engineers per year have been graduating in India from universities approved by MHRD [12]. This gives a lot many designers needed at the scale needed for Indian industry.

The design process involves early interactions with its users, and therefore has higher acceptance rates by potential customers and hence increased chances for businesses to survive. Design activities must start early on in science and technology development in the areas of national challenges. This is required to inculcate a culture of creating new designs and innovations in Indian organisations. The UK's design strategy also emphasises the need for early-stage design foundation in their national priority areas [8]. Early stage design activities would also help in creating more intellectual property registrations for India. The STI Policy

does not mention the need for increasing patents in India, though the need for more publications in high-impact journals are stressed. The NDP refers to promote design registrations, which is important for industrial designs, however design registrations only protect the appearance or the aesthetics. For achieving India's goals of socio-economic developments, we require more patents protecting new designs and methods, that can create wealth.

India must leverage the design culture of the country, where common people do not hesitate to innovate at grassroots level, by promotion of such innovations and attending to the needs that gave rise to it. National Innovation Foundation, under DST supports grassroot innovations [13]. National Initiative for Design Innovation by MHRD has Design Innovation Centres connecting around 60 engineering institutes across India, including IITs and IISc, to support design and start-up activities [14]. Atal Tinkering labs by Niti Ayog promotes innovation at K-12 level [15]. The Design Clinic Scheme of NDP, provides design awareness and design services to MSMEs. Diverse schemes exist with common goals across ministries. Therefore, collaboration among ministries of S&T, HRD, Commerce and Industry, and the departments DIPP, DST, Higher Education are necessary to work together to draft national policies with common goals and agendas for better policy making and action plans.

Policy makers of STI and NDP may consider the five questions below as framework. Addressing them systematically will help create better policies to create a design-led economy to meet the development goals of India.

1. What is design and innovation?
2. How to design and innovate?
3. Who can design and innovate?
4. How to inculcate design culture at an organisational level?
5. How to create new businesses from design?

5. Key Recommendations

- A broad definition for design as a method required in both STI and NDP policies.
- Incorporate design culture across industry levels, viz., high-tech manufacturing, SMEs, MSMEs.
- Incorporate design early on in organisations to create designs with business potential, and reduce time to market.
- Acknowledge and encourage design of new products for B2Bs (machine tools, computer-aided manufacturing equipment), instead of importing technologies.
- Educate and create awareness of design in scientific organisations, industries and universities.
- Collaborate among existing design and technology communities to leverage complementary knowledge and skills to promote design innovation in cross-cutting disciplines.
- Leverage existing schemes of other ministries like, Design Innovation Centres, Atal Tinkering Labs for knowledge sharing and collaboration.

- Encourage diversity of curriculum in design education programmes in universities to meet the diverse knowledge needed from designers in different sectors.
- Leverage the design culture of the country where common people do not hesitate to innovate at grassroots level, by promotion of such innovations and attending to the needs that gave rise to it.
- To tackle the lack of designers, leverage the large pool of engineering graduates in the country by giving them training in design at engineering education, and post-engineering courses. This gives a lot many designers needed at the scale needed of India Inc.
- Collaborate among ministries of S&T, DIPP, MHRD to work together to draft policies to have a broader vision.

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