The Role of Industrial Design in India's Economic Developments in the Next Decade

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Abstract:

Business growth and job creation are among the priority concerns of the government in India. The country today has the largest number of working-age people in the world, and it is expected to remain so for the next one and a half decades. The Indian economy offers a unique scenario. The majority of its industries comprise of micro, small and medium enterprises, MSMEs and are spread across the country. Its service sector is today the backbone of the economy and offers huge potential for growth and creation of jobs in the country. And it is expected that India will remain largely a rural country during the next decade.

Industrial designer's creative problem-solving approach coupled with technical expertise will help these industries improve their existing products, processes, and productivity, with a minimum of investment and resource allocations. Her user-centric approach would help the industries align their offerings with the contemporary market demands and expectations. Thus improving their manufacturing competitiveness, the design will help these MSMEs move up in value chain, from OEM to ODM. With her ability to take a holistic view designer would help the country's service sector improve its complex systems and services to create cohesive experiences. She would facilitate and coordinate various efforts and expertise to develop tomorrow's smart products, services, and systems. For the next decade, the industrial design would be crucial for the Indian industries to transit into the Industry 4.0 era and the digital and experience economies of tomorrow. The industrial design would thus be a critical component of the strategies for economic reforms in India.

Introduction:

Increasing the pace of economic reforms and hastening its integration into the global economy is the priority concern of the government in India. The reforms that began with the opening up of its economy in the year 1991, have gained momentum with the announcements of various sector-specific impetus over the last few years. Emphasis is on manufacturing-led growth by increasing the share of manufacturing in the GDP. Efforts are thus directed towards increasing the manufacturing

competitiveness of its industries and fostering and nurturing the culture of innovation within the economy. In the ranking of ease of doing business, India has moved up to 77th rank, from its 142nd rank in the year 2014 [1]. And among the world's 10 largest manufacturing countries, India's ranking has improved by three places to the sixth position in the year 2015 [2]. India has also improved its ranking on the Global Innovation Index (GII) 2019, to reach 52nd position, from 81st rank in 2015, which is the fastest growth by any major economy [3]. India is today among the most innovative economy in Central and Southern Asia [3]. The country's rate of economic growth over the last few years has been consistent and on the rise. And the government is taking proactive steps to further simplify its processes for doing business and for attracting foreign direct investments in various sectors of its economy. India is expected to be the 3rd largest consumer market in the World by 2025 [4]. With its young population, English proficiency, healthy household savings, and increasing integration into the global economy, the long-term growth prospective of the Indian economy is positive [5].

The priority areas for the government are thus fairly defined. The country today has the largest number of working-age people in the world, and it is expected to remain so for the next one and a half decades [6]. Job creation for its large young population and skill development are among the priorities of the government. The aim is to create 100 million jobs in the next five years. A series of measures have been initiated to encourage start-ups in the country and to foster innovation among the young generation. 'Start-up India', 'Stand-up India', 'Pradhan Mantri Mudra Yojana', National Skill Development Mission, setting up of Incubation Centers, etc. are some of the schemes launched and initiatives taken by the government to encourage skill development, self-employment and entrepreneurship in the country. And with the view to increase the pace of growth of its manufacturing sector, the Government of India in the year 2014 announced an ambitious national campaign, 'Make in India'. The campaign aims to increase manufacturing growth and make India a global manufacturing hub.

The manufacturing sector, it is recognized, has a multiplier effect on the creation of jobs, even in allied sectors. The industry sector in India contributes 29% of its GDP [7]. And over 90% of the industries in India are micro, small and medium enterprises, MSMEs, spread across the country [8]. The MSME sector has been creating 111

million jobs in rural and urban areas [9]. Among the other sectors contributing significantly to job creation, up-skilling and contribution to the GDP are it's IT industries. India is today the topmost offshoring destination for IT companies across the world. The country has become the digital capabilities hub of the world with around 75% of the global digital talent present in the country [10]. IT workforce is expected to touch 30 million by 2020 [11]. Along with IT, telecom, infrastructure, health and retail sectors of industries are expected to be the major sectors that will create employment in India in the future [11]. And for its majority rural population, the craft sector forms the second-largest source of employment, employing about 8.0 million people [12]. Education, healthcare, financial inclusion, agricultural productivity, and governance, etc. are some of the other priority areas identified by the government for the sustainable and inclusive growth of the country [13]. And under its 'Smart Cities Mission', the Government of India projects to build 100 smart cities across the country [1].

Economic Development and Design; the Global Scenario:

For the governments and policymakers across the world, job creation and business growth are their critical concerns [14]. Their efforts are largely directed towards finding ways to support high growth industries, accelerate innovation, foster entrepreneurship and build human capital. Design, it is now recognized, is the critical component of these strategies for growth. Design helps industries become more competitive; provides critical ingredients for innovation; catalyzes community revitalization; and can deliver a better-prepared workforce [14]. It is now established that there is a strong, positive relationship between overall national competitiveness and the use of design [15]. *Long-term growth*, it is understood, *is provided by technical innovation, and technical innovation is provided by creative mental* [16].

As an essential component of innovation, the design is used extensively by the industries, especially in Southeast Asia. Southeast Asian countries, China, South Korea, Taiwan, are today the manufacturing hubs of the world. Technology is recognized here, as the key driver of innovation and technical design expertise is highly valued. Design is rooted here in its rich heritage of crafts and culture. A creative and systematic problem-solving activity, the design is positioned here at the intersection of art, business, and technology. The focus in higher education is thus towards promoting multi-disciplinarity as a catalyst for innovation [17]. Education

programs in design have been set up and developed with collaboration as its core element; collaboration both within the institutions and with external businesses and other organizations. There is a sense that 'design is getting bigger' and the world will need a wider range of designers and design specialists [17]. These countries are thus rapidly developing their design capabilities. In China, the design is the third most popular university subject [17].

Industries around the world are now transitioning into Industry 4.0. This emerging era is expected to provide increased manufacturing flexibility, short lead-time to market, improved productivity, better quality outcomes and increased scope for mass customization [18]. The era is characterized by automation, intelligence, the Internet of Things (IoT), and smart manufacturing [19]. The smart and connected products of this era use more amount of software to make them productive, intelligent and user-friendly. Its technologies will be driven by hardware, embedded software, and application software. The Internet of Things (IoT) will help manufacturers receive information from products in the field that can then be used to further improve their products and offerings. Industries, therefore, need to now build their capabilities and expertise in data analytics and product design. The manufacturing and service sectors are now increasingly getting intertwined, creating new kinds of networked enterprises. The materials, manufacturing processes, machinery and equipment used, manufacturing methods, they are all going through a major transformation. The product development process is now increasingly powered by leading age technologies like artificial intelligence (AI), virtual reality (VR), 3D graphic visualization, real-time engineering simulation, etc. [20]. Virtual prototyping and augmented realities make it possible for the design team to be based and distributed globally. These new technologies and tools help make the design simpler and more effective. With material sensitivity, craftsmanship and product quality, industrial design is now expected to also create experiences. And ecological concerns and sustainability values are the critical factors to be encompassed within the design. Industrial Design is thus becoming more and more sophisticated [2].

Indian Economy and its need for Industrial Design Interventions:

The manufacturing sector, it is now recognized, has a multiplier effect on the creation of jobs, thereby rising income and improving the quality of life, especially for developing countries like India. The efforts are thus directed to enhance its share in

GDP from 18% at present, to 25%. Industries in India offer a unique scenario with its organized sector comprising the large, medium and small-scale industry, while the unorganized sector comprises majorly the micro-enterprises and crafts clusters. And it is expected that India will remain largely a rural country during the next decade [21]. In this context, the growth of the country's large micro, small and medium enterprises, MSMEs is vital. The MSMEs create employment opportunities at the local and regional levels; thereby help tackle the problems of regional disparity.

With the competitive pressures of globalization, today's free-market economies, and rapid changes in technologies, the manufacturing competitiveness of the MSMEs in India is today facing a major challenge. Characterized normally by their constraints of resources, labor-intensive processes, traditional methods of production, unergonomic and unhygienic work environment, old and improper tools and techniques, etc., their immediate focus would be towards tackling their day-to-day issues and challenges. These MSMEs need to improve their business, processes, products and their technology used, to survive in these rapidly changing global markets. Their products have to be improved from aesthetics, ergonomics, functionality, the addition of new feature perspectives, etc. And the products and processes have to be optimized to reduce cost and improve quality. Standardization of components, modular approach, ease of assembly and maintenance, optimized after-sale services, etc. need to be explored to improve manufacturing competitiveness. A design engineering approach would be more appropriate here to help them explore the solutions that can be immediately implemented with a minimum of investment and resource allocations, and thereby improve their existing products, processes, and productivity.

Shifting consumer preferences and the influx of cheaper substitutes are the critical challenges faced by the micro-enterprises, especially its craft clusters. The design would complement crafts to develop contemporary applications while utilizing their existing skills and resources. The design here incorporates the traditional, social, cultural and ecological aspects of the region and has the power to give a cutting edge to locally produced goods by embellishing them with a global outlook in terms of their styling, appeal, and performance. Sustaining this sector demands creative people-centric design solutions. The designer's ability to take a holistic view and her wide exposure and experience in the field helps her act as a catalyst to bring new vision and change into the industry. The Designers' problem-solving ability and their ability

to effectively communicate at various levels help transform constraints into unique opportunities.

The IT industry, the country's one of the most successful industry sectors, has proven its expertise in customized IT solutions to global clients. These solutions would comprise product/s (technology applications), their interfaces, interactions, services, and strategies, however, each of them demands different approaches of design. With the product markets now saturated, the focus has shifted to other components of the digital solution, namely interfaces, interactions, services, etc., with resultant deliverable/s as overall user experience. The solutions have to be aligned with the needs and expectations of the users and their interface/s need to be humanized to create smart, natural and adaptive interactions. Changing the approach - from the currently practiced 'inside-out' (technology application/ product-centric) approach to the 'outside-in' approach, primarily a service design approach would help these industries advance into the emerging digital and service economy.

The service sector in India contributes to around 53% of its GDP [7]. Known as the tertiary sector of its economy, the sector is among the fastest-growing service sectors in the world. Some of its key sectors include IT, health care, education, retail, railways, banking and financial services, skills, start-ups, etc. The sector has huge potential for growth and creation of jobs in the country. The Indian healthcare sector itself is expected to generate 40 million jobs in India by 2030 [22]. The design would help here develop the much-needed holistic understanding and system perspectives. Service operates within a complex system, with its elements interlinked and intertwined. With space, products, graphics, interactions, etc. as its elements, improvement of service calls for a variety of different expertise. The design would help identify opportunities and prioritize scope for interventions. The designer works here as a facilitator and coordinator to bring together all the various efforts to a positive outcome. Design helps improve touch-points, humanize interactions and create cohesive experiences, thereby improve the overall service.

These industries need to move up in the value chain, from Original Equipment Manufacturer, OEM to Original Design Manufacturer, ODM and further to Original Brand Manufacturer, OBM. These call for the change from traditional methodology to an innovative product development process and the ability to remain in the business

with a competitive advantage. A user-centric approach would help them convert their technological solutions into products and user-specific solutions thereby help create the much-needed value addition to their strengths. While developing unique solutions/products as per the markets and user needs, the design will help align the solutions to the available resources and capabilities of the individual units. With the newly designed products compatible with global trade, these interventions would certainly help develop a strong brand value for their industries. The design would also, in the process, help create and foster innovation culture within these industries. Holistic solutions thus provided through design interventions would certainly result in incredible benefits and major value additions for these industries to stand out in the competition.

Conclusions:

Business growth and job creation are among the priority concerns of the government in India. The government has initiated several proactive measures to address these critical concerns. The pace of economic reforms and thereby its integration into the global economy has now gained momentum. The country has substantially improved its world ranking in ease of doing business and is today among the most innovative economy in Central and Southern Asia. The country's rate of economic growth over the last few years has been consistent and on the rise. India is expected to be the 3rd largest consumer market in the World by 2025.

The Indian economy offers a unique scenario. It is normally classified into three broad sectors. Its industry sector contributes 29% of its GDP. Over 90% of these industries are micro, small and medium enterprises, MSMEs. And the majority of these MSMEs are unorganized and micro-enterprises and are spread across the country. Its organized sector comprises the large, medium and small-scale industries. India's service sector contributes 53% of its GDP and is the fastest growing service sector in the world. And its agriculture and allied sector contribute about 17% of its GDP. The country today has the largest number of working-age people in the world, and it is expected to remain so for the next one and a half decades. And India is expected to remain largely a rural country during the next decade.

Recognizing that the manufacturing sector has a multiplier effect on the creation of jobs, the emphasis is on increasing its share in GDP from its present 18% to 25%. To

survive and grow in today's increasingly globalized and free markets, these industries have to constantly improve and innovate their products and offerings. Their processes have to be optimized and productivity has to be improved. And its micro-enterprises, majority craft sectors have to align their offerings with the contemporary user needs, preferences, expectations, and aspirations. The country's service sector, the backbone of its economy, has to now advance their offerings from products/ technology solutions to services and further to experiences. To remain competitive in these fiercely competitive and rapidly changing markets, these industries will have to move up in the value chain; from OEM to ODM and further to OBM.

Design is now recognized the world over as a critical component of the strategies for job creation and business growth. Design helps improve the competitiveness of the industries, foster innovation and revitalize community participation. It is an essential component of the process of innovation. In the major industrial economies, design as an activity is positioned at the intersection of art, technology, and business. And technical design expertise is highly valued here. The emerging Industry 4.0 era will provide further manufacturing flexibility, shorter lead-time to market and further scope for customization. It's connected products and systems will increasingly use software with hardware. Their materials and manufacturing processes have also changed. Businesses across the world are thus going through a major transformation. Industrial design, now a sophisticated practice aided with new capabilities and leading age technologies, would help deal with these complex systems, greater responsibilities, and increased expectations.

A design engineering approach, a creative problem-solving approach coupled with the expertise of technology, would be more appropriate here in India to improve the existing products, processes, and productivity of its industries, majority of them characterized by their constraints of resources. The designer's user-centric approach would help them align their offerings with the contemporary market demands and expectations. With her ability to take a holistic view, the designer would help improve complex systems and services and create cohesive experiences. She would facilitate and coordinate various efforts and expertise to develop tomorrow's smart products, services, and systems. With a global outlook, sensitivity to local needs and aspirations, the designer would handhold these industry/craft/client to convert their technological solutions/offerings into products and user-specific solutions thereby

help the industries move up in value chain, from OEM to ODM and further to OBM. Designer, with her wide exposure and experience in the field, now aided with new capabilities and new technology tools would act as a catalyst to bring new vision and change into the industry. For the next decade, the design would be crucial for the Indian industries to transit into the Industry 4.0 era and digital and experience economies of tomorrow.

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