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## Role Of Skilled Worker In Industry 4.0 To Improve The Quality Of Product In Manufacturing Phase In India

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**Abstract:** *The manufacturing industry plays a very important role in the development of any country. The current era is an automated phase in which many changes from the traditional method of production to new computer-controlled machines are able to perform more detailed work with minimal human intervention. But now the one-day industry known as industrial 4.0 is currently undergoing a fourth industrial revolution, better known as Industrial 4.0 where the 'real' and 'real' world will be seamlessly connected leading to what are known as cyber-physical production systems. As a result, traditional production processes undergo a major transformation that will change the way companies deal with production.*

*In their journey to embrace Industrial 4.0, each country is expected to face many challenges related to the level of skills of its workers. Valuable skills today will expire in the future and all employees are expected to have new skills in the field of information technology, data analysis, practical intelligence etc. A high percentage of jobs will prioritize cognitive skills and system skills. in addition to physical activity skills while defining job-related skill sets.*

*This study contributes to the information body by closing the gap in existing documentation by moderation and clarifying the impact of the availability of skilled workers in industry 4.0.*

**Keywords** *Industry 4.0, Automation, Skilled worker, Manufacturing*

### Introduction and Literature review

According to historians, human civilization, to date, has three industrial revolutions: the first industrial revolution (mechanization), the second industrial revolution (mass production and electricity), and the third industrial revolution (automation) [1, 2]. These changes are not the only ones influence production models and businesses: also affect the skills needed by the future workers in various industries [3]. From one industrial revolution to the next, other jobs they disappeared before the creation of others. More importantly, some skills may not work in time some became valuable. The forthcoming fourth industrial revolution is similar job transfer and skills transfer. Industrial 4.0, an approved step drive for the fourth industrial revolution, characterized by significant technological advances that require a special and skilled workers [3].

Industry 4.0 is driving the world in a global, automated, transparent, and flexible environment, results in a global competition for jobs that require special skills in digital economy and sharing [4]. The adoption of Industrial 4.0 technology enables people to work digitized and networked a work environment that enhances interaction with algorithms and robots, as well as practicality earth [5]. These changes lead to new job requirements for a set of specialized and

unique skills [6, 7]. There should therefore be a significant change in skills needs within the four quarters industrial change and the three previous industrial protests. The acquisition of appropriate skills and competencies for the country's employees will have a significant impact successful adoption of Industrial 4.0 at micro- and macro-level. In addition, the level of skills and staff qualifications will play a significant role in promoting new innovation as well institutional competition [3, 8]. On the other hand, the lack of necessary skills will lead to a significant decrease in performance and a decrease in competition in organizations. However Schallock, Rybski, Jochem, and Kohl [9] argue that Industry 4.0 is more than just technological advancement; should also prioritizing human resource development, which includes developing the skills that will be required the future [9].

Unemployment is one of the biggest challenges facing developing countries, including South Africa. Listed among the causes of high unemployment are: (a) I the discrepancy between the skills available and the skills required in the industry; (b) a high level of unskilled labor function; and (c) inadequate education [10 - 12]. Industry 4.0 offers a number of opportunities quality and productive work. The problem is that Industry 4.0 is strong increasing unemployment through the loss of handicrafts and repetitive tasks that can be easily overcome automation, unless the topic of skills and the potential of the digital economy is discussed start by developing skills development in technical and educational institutions.

Developing countries are facing an acute shortage of professionals with the required industry 4.0 set skills [13]. This makes it necessary to investigate further the essential needs of skills in this digital economy, as well as determining how these skills can be developed and integrated in existing educational structures.

Shvetsova and Kuzmina [14] show that there is a gap between the required skills and skills developed during Industry 4.0. This is because there is no clear recognition of skills that meet the requirements of Industrial 4.0. South Africa's National Development Plan prioritises job creation once and for all quality education and skills development in a sustainable manner integrated development and poverty

alleviation [15]. In the 2019 State of the Nation Address, the President South African pointed out that one of the challenges facing the nation is job creation. Continue he pointed out that the government wants to address the changing needs of skills and skills needs future by improving training in the education system [16]. This confirms the investigation In industry 4.0 skills requirements and skills development framework are essential. This paper aims to investigate the skills requirements of Industrial 4.0 in engineering work as well skills development by conducting systematic review (SLR). Test for The impact of Industry 4.0 on technical institutions, unlike educational institutions, will be discussed. This paper conducts experimental research to improve skills development a framework that aims to close the gap between Industrial 4.0 skills needs and development in South Africa. The draft paper is as follows: Section 2 introduces Industrial 4.0 framework, and Section 3 introduces how to investigate skills needs in the industry 4.0. SLR results and discussion of the results presented in Phase 4 and Phase 5 respectively. Section 6 presents the conclusion and future work.

The rapid transformation of careers has resulted in a mixture of skills, attitudes, knowledge, and requirements in Field 4.0 [17-19]. The tendency for job difficulties has increased successive industrial changes [20]. Industry 4.0, due to driving the fourth industry change, can be a major risk to employment, given the increase in complexity 91 workplace requirements. This result extends to the requirements of job skills and competencies development in educational institutions. Doing research on skills needs in the Industrial 4.0 era is important because it is valuable job seekers and skills development institutions about what they should do and what they should do wait. Adolph, Tisch, and Metternich [21], referring to production facilities, point to that technical megatrends will greatly affect the skills and competencies required. This is in sequence requires organizations to develop strategies, and skills development institutions to be innovative, in building the necessary skills and abilities.

## Industry 4.0 Technologies

Industrial 4.0 incorporates a growing trend in automation, data exchange in technology, and processes within the manufacturing industry, including:

### Internet of Things (IoT), Internet of Things (IIoT)

### Cyber-physical systems (CPS), Cloud computing, Block chain, Artificial intelligence

### Intelligent industries, intelligent production

Industrial 4.0, also sometimes called intelligent production, refers to physical production and the use of intelligent digital technology, machine learning, and big data to create a broader and more connected ecosystem for companies focused on manufacturing and procurement control.

**Robots:** Initially, it was possible for large corporations to create robots with equally large amounts of robots, but now robots are much more affordable and available to organizations of all sizes. The introduction of robots in the production system works very well as they can help in managing various things like manufacturing, manufacturing, and shipping.

**Additive manufacturing (3D printing):** As I have seen a major change over the past decade, this technology is now being used in real production instead of just prototyping. Advances in the use of metal additives have opened up many production opportunities and many new industries are in the process of implementing this new method.

**The Internet of Things and the Cloud:** The Internet of Things is an important part of Industry 4.0. Identified by connected devices. IoT is not only useful for internal operations, but by using the cloud environment in which data is stored, equipment and functionality can be improved by improving the data on the use of the same devices individually.

### Skills Needed for Success in Industry 4.0

With the development of Industry 4.0 and the transformation of the technology sector, new skill

areas are needed to succeed in this novel field. Some skills that a person can work on and develop are:

Analytical Ability

Critical thinking

Familiarity with new technologies

Eager to learn about upcoming technology

Effective Problem Solving

Both the team player and the team leader

Ideation

Composing

Pay attention to detail

Creativity and originality

### Industry 4.0 and its Qualifications

Industry 4.0 offers a comprehensive, integrated production approach. It ensures physical and digital communication, and improves the quality of collaboration across departments. Therefore, Industry 4.0 benefits industrial owners to grow their operations successfully.

Companies using this technology recognize the power of Industrial 4.0. Therefore, it can easily be understood that educational institutions and universities need to incorporate new courses (such as IoT, Cyber security, Robotics, 3-D printing, etc.) into their curriculum so that industries can easily employ this industrious and trained engineering team.

IoT-enabled technology will give the manufacturer the opportunity to realize its functionality with perfect visibility. From buying raw materials, storage, and production analysis, everything can be taken care of with this technology. In all of the above activities, a successful student with expertise in intelligent production and Industrial Automation will be able to add real value to achieving the desired goals of the industry.

### Skill development program in India

- Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
- Rozgar Mela

- Pradhan Mantri Kaushal Kendras (PMKK)
- Capacity Building Scheme
- Udaan
- School Initiatives and Higher Education
- India International Skill Centres (IISCs)
- Pre Departure Orientation Training (PDOT)
- Craftsmen Training Scheme (CTS)
- Crafts Instructor Training Scheme (CITS)
- Apprenticeship Training under the Apprentices Act, 1961
- Advanced Vocational Training Scheme (AVTS)
- Vocational Training Programme For Women
- Schemes for Up gradation of it is
- Flexi MoUs
- STRIVE
- Initiatives in the North East and LWE Regions Trade Testing
- Current Initiatives in the DGT Landscape

#### REFERENCES

[1] Schwab, K. 2018. The Fourth Industrial Revolution. [Cited 23 April 2019]; available from: <https://www.britannica.com/topic/The-Fourth-Industrial-Revolution-2119734>.

[2] Darwish, H. 2018. Expanding industrial thinking by formalizing the industrial engineering identity for the knowledge era. PhD Thesis, Potchefstroom: North-West University.

[3] Beneš, A. and Tupa, J. 2017. Requirements for education and qualification of people in Industry 4.0. *Procedia Manufacturing*, 11, pp. 2195-2202.

[4] Motyl, B., Baronio, G., Uberti, S., Speranza, D. & Filippi, S. 2017. How will change the future engineering skills in the Industry 4.0 framework? A questionnaire survey. *Procedia Manufacturing*, 11, pp. 1501-1509.

[5] Richert, A., Shehadeh, M., Plumanns, L., Groš, K., Schuster, K. and Jeschke, S. 2016. Educating engineers for Industry 4.0: Virtual worlds and human-robot-teams: Empirical studies towards a new educational age. In 2016 IEEE Global Engineering Education Conference

- Dual System of Training (DST)
- Polytechnics

Apart from government sector lot of private companies is also offering various training program such as TCS, IBM etc.

**Conclusion.** From the above study lot of effort is needed to find relevant labor for Particular work. Lot of skill development program is carried out in India to develop his manpower and improve his skill level. But to find out suitable person for suitable job is a big challenge. Advanced technology is not intended to shut people out instead of improved productivity; rather, there should be a strong interaction of the human machine. Technological and educational institutions must open the lines for lifelong learning to meet the challenge of rapid change in skills needs in Industry 4.0. The development of multi-interdisciplinary skills may be required in industry 4.0 in order to achieve efficiency of labor in engineering work

(EDUCON). Abu Dhabi, United Arab Emirates, IEEE.

[6] Kergroach, S. 2017. Industry 4.0: New challenges and opportunities for the labour market. *Foresight and STI Governance*, 11(4), pp. 6-8.

[7] Grzelczak, A., Kosacka, M. and Werner-Lewandowska, K. 2017. Employees' competences for Industry 4.0 in Poland – preliminary research results. In 2017 24th International Conference on Production Research (ICPR). Poznan, Poland, pp. 139-144.

[8] Mavrikios, D., Georgoulas, K. and Chryssolouris, G. 2018. The teaching factory paradigm: Developments and outlook. *Procedia Manufacturing*, 23, pp. 1-6.

[9] Schallock, B., Rybski, C., Jochem, R. and Kohl, H. 2018. Learning factory for Industry 4.0 to provide future skills beyond technical training. *Procedia Manufacturing*, 23, pp. 27-32.

[10] Ongbali, S.O., Afolalu, S.A. and Udo, M.O. 2019. Factors causing youth unemployment problem in Nigeria: A review.



International Journal of Mechanical Engineering and Technology, 10(1): p. 1874-1879.

[11] Government. Understanding the root causes of unemployment. 2019. [Cited 01 April 2019]; available from: <https://www.gcis.gov.za/content/resourcecentre/newsletters/insight/issue13>.

[12] Kirk, D. 2010. Causes of unemployment in South Africa. [Cited 05 April 2019]; available from: <https://twentythirdfloor.co.za/2010/12/01/causes-of-unemployment-in-south-africa/>.

[13] Pradhan, A. and Agwa-Ejon, J. 2018. Opportunities and challenges of embracing smart factory in South Africa. In 2018 Portland International Conference on Management of Engineering and Technology (PICMET). Honolulu, HI, USA, IEEE.

[14] Shvetsova, O.A. and Kuzmina, A.D. 2018. Development of engineering personnel in the era of the Fourth Industrial Revolution. In 2018 Third International Conference on Human Factors in Complex Technical Systems and Environments (ERGO) and Environments (ERGO). St. Petersburg, Russia, IEEE, pp. 45-48.

[15] Government. National Development Plan-2030 Executive Summary. 2012. [Cited 27 February 2019]; available from: <https://www.gov.za/issues/national-development-plan-2030>.

[16] Government. State of the Nation Address. 2019. [Cited 27 February 2019]; available from: <https://www.gov.za/state-nation-address#2019>.

[17] Baker of Dorking, K. 2016. The digital revolution: The impact of the fourth industrial revolution on employment and education. [Cited 23 April 2019], available from: [http://www.edge.co.uk/media/193777/digital\\_revolution\\_web\\_version.pdf](http://www.edge.co.uk/media/193777/digital_revolution_web_version.pdf).

[18] World Economic Forum. 2016. The future of jobs: Employment, skills and workforce strategy for the fourth industrial revolution. Global Challenge Insight Report, World Economic Forum, Geneva. 102

[19] World Economic Forum. 2017. Realizing human potential in the Fourth Industrial Revolution: An agenda for leaders to shape the future of education, gender and work. World Economic Forum, Geneva.

[20] Selamat, A., Taspir, S.H., Puteh, M. and Alias, R.A. 2017. Higher education 4.0: Current status and readiness in meeting the Fourth Industrial Revolution Challenges. Redesigning Higher Education towards Industry, 4: pp. 23-24.

[21] Adolph, S., Tisch, M. and Metternich, J. 2014. Challenges and approaches to competency development for future production. Journal of International Scientific Publicationsâ€“Educational Alternatives, 12(1): pp. 1001-1010.