

## EXPLORING EMPLOYEE'S DIGITAL LITERACY IN THE MANUFACTURING INDUSTRY SECTOR OF GUJRANWALA FOR INDUSTRY 4.0 IMPLEMENTATION

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### ABSTRACT

*In the era of technology competition and sustainability digital skills and grip over essential tools to increase the employee productivity is the need of the hour to compete in the market and maintain the sustainability. In order to achieve the status of a leading manufacturing organization in low Income countries of Pakistan digital literacy level assessment is necessary for unveiling human resource related challenge in the era of industry 4.0. In order to align with the focus of this study, a qualitative case study approach used which investigated the experiences and perception of employees who are using digital tools and technology leading advanced skilled comparable to their lower level hierarchy. Top level employee projected advanced skills as compared to low level. The main focus included technology integration and digital strategies which has practical implications of digital tools. After the thematic analysis the study encouraged for training & organizational support to bridge the digital literacy gap which in turn boost a more inclusive and digitally competent workforce.*

### INTRODUCTION

In the modern manufacturing environment, digital technology integration is now essential for organizational development and competitiveness rather than a luxury (Thummasena et al., 2024). Sustainability, innovation, and operational efficiency now depend critically on employees' ability to use digital tools and navigate them (Lim, 2023; Martínez-Peláez et al. 2023). Still, even with the obvious benefits of digital literacy, determining the level of competency that workers in manufacturing companies currently possess is a difficult task (Muzam, 2023).

The industry 4.0 has shift the era of conventional manufacturing to widespread automation which needs significance level of digital literacy for the manpower as competitive advantage. (Malik,

2021) . So it's essential to explore the digital literacy level of manufacturing sector of Gujranwala to assess the maturity level for industry 4.0 implementation.

Digital literacy is considered to give potential sustainability in almost all the industries irrespective of their types globally and the organizations have started to reap the advantages of digitalization for sustainability in the market . (Ms.Anitha, 2021) A research projected that digital literacy is value profile and must be in align with strategic goals for rich HR competencies and cause the retention of employees (Ms.Anitha, 2021)

The issue at hand is the requirement for a thorough grasp of the degrees of digital literacy

within a particular manufacturing sector. This study aims to elucidate the subtleties of employees' digital competency, pinpointing areas in need of development as well as their strong points. The ultimate goal is to offer practical insights that can guide initiatives and specialized training plans aimed at improving the organization's digital capabilities.

## 2. Literature Review:

Academic writing has started to emphasize how crucial digital literacy is to the manufacturing industry. Studies conducted by Ramli and Arsad, (2023) demonstrate that digital literacy includes the ability to critically evaluate and apply digital information in a context-specific manner, in addition to basic technical skills. Technical proficiency is often a cornerstone in the manufacturing context, as evidenced by the writings of Roberts and Cullinane (2023) and Siemon and Kedziora (2023), who argue that employees must be skilled in using industry-specific digital tools for optimal performance.

The new era of forth industrial revolution which includes both AI , Internet of things ,Cyber physical systems and big data analysis revolutionized the overall industry paradigm which shows huge shift from the conventional work force to the work force with digital literacy.

The emergence of digital workspace as the new game changer and make the worker to work both conventional workstation as well as cyber physical systems this work space will enable the worker in increase their productivity and flexibility and also help them to manage their work. (Koslowsky, 1996)

The information literacy is a critical component of digital literacy. Workers in the manufacturing sector need to be proficient in navigating, evaluating, and utilizing digital information sources because staying informed is crucial to being competitive in this rapidly evolving industry (Sun, et al., 2023). Additionally, Ahmad, et al.'s (2020) study highlights the significance of information literacy for manufacturing organizations' decision-making procedures.

The role of digital innovation and collaboration in manufacturing companies has remain a topic of interest for many scholars (Moreno et al., 2024).

This work argued that when workers actively engage in digital collaboration and assist in identifying and implementing digital solutions, they are critical to enhancing organizational effectiveness and encouraging innovation.

With reference to Pakistan, the main issue which literature is showing is the budget allocation. Planting technology and building resources for its effective use requires a handsome amount of financial resource. Which isn't a suitable and manageable option for many industries (Aijaz, Lodhi, Shamim, & Mughal, 2024).

Researches have also identified the gap between the available services and human literacy required to avail and utilize these services especially in the field of medicine. This discrepancy has created the gap in establishing latest technologies in many prominent domains (Waheed, 2024).

### 2.1 Research Question:

The following research issue is intended to be addressed by this study:

- a. What are the experiences and perceptions of employees manufacturing sector of Gujranwala regarding their digital literacy, for implementation of industry 4.0?
- b. Is there any discrepancy regarding digital literacy level in management tire?

### 2.2 Research Objectives:

In order to achieve the overall purpose of this study, the following particular goals have been determined:

- To explore employees' technical competence in using digital tools related to manufacturing processes
- To examine employees' proficiency in interpreting and utilizing digital information for informed decision-making

## 3. Methodology

To conduct this research, we choose qualitative approach the reason to choose this approach is that it helps us to get rich information about the employee's experiences, expectations and perceptions about the digital tools. This approach can provide a comprehensive view that can guide

the development of customized training programs and strategies

### 3.1 Sample & Population:

The target audience for this study is employees of manufacturing sector Gujranwala. A convenient sampling technique will be applied to ensure representation from a range of departments, roles, and responsibilities. By doing this, as opposed to focusing on a specific subset, the research seeks to acquire a comprehensive image of the levels of digital literacy across the entire enterprise.

To collect data, the researcher conducted these interviews from the following groups in manufacturing sector and get this data by directly approaching to the employees as it is the primary data and the accuracy of data is very important: -

| S/No | Population                    | Number of participant |
|------|-------------------------------|-----------------------|
| 1    | Top Level management          | 3                     |
| 2    | Middle level management       | 4                     |
| 3    | Lower level /Supporting staff | 3                     |

### 3.2 Data Collection:

The primary instrument for data collection will be a semi structured interview. The carefully thought the main aspect of these interview question to get insight of the organization as whole about their perception of digitalization and understanding their readiness for it.

The data was collected using purposive sampling from Industrial sector of Gujranwala. Audio data was recorded

### 3.3 Data Analysis:

After transcription, member checking technique was used to establish the reliability and validity of the qualitative study. Then data was read out to be familiarization with data. After transcription the key words were coded to generate the themes. After coding following key themes were identified: -

## Findings

### Theme 1: Technological Integration

#### Description:

This theme mainly explores the level in which digital tools and technology are integrated in day to day operations of organizations.

#### Sub-Theme 1.1: Types and Mediums of IT Gadgets

##### Supporting Data:

- *Management Perspective*: “We have been using different types of digital devices like desktops, laptops, tablets and smart phones which are quite integral part in managing the complex operations like SAP System to perform real time data analysis”
- *HR Perspective*: “Our main operation no mostly dependent on computer and smart phone for conducting our operations smoothly which include hiring, salaries and employee’s data management”
- *Supervisor Perspective*: “we mainly use the modern digital devices like computers and smartphones for the purpose of communicating and entry of data in organizations database systems”
- *Office Boy Perspective*: “we use the digital tools for very basic purpose like for doing telephonic conversations and may be some little bit work related to office”

#### Analysis:

Digital technology integration across the various management and HR roles showed quite high level of dependency on latest digital devices ,while the lower level management showed very low level of technological engagement .This disparity indicates the uniform assess and according to digital literacy level related training programs for proper implementation of digitalization.

#### Sub-Theme 1.2: Determining Digital Tools and Configurations

##### Supporting Data:

- *Management Perspective*: “we try to be very careful while obtaining any digital



device mainly focusing on its configuration based on the task requirement and we do this by having very close collaboration with the IT team to achieve best output”.

- *HR Perspective*: “Our dependency is typical on IT for the configurations needed related to the digital devices and software required to perform our administrative tasks”
- *Supervisor Perspective*: “We need IT team guidance for the device configurations”
- *Office Boy Perspective*: “Our all dependency is on the supervisors and IT team for selection and installation of digital devices.”

#### **Analysis:**

The role of management in active participation for prescribing the digital tools needed for the tasks assigned to them while other depends more on the IT support team. This identify a gap of low digital literacy level among which could be solved by designed trainings and resources.

#### **Theme 2: Digital Literacy and Online Behavior Description:**

This theme focus on the digital literacy level and employees online actions of all the organizational level employees to see their internet usage ethics and how they see plagiarism.

#### **Sub-Theme 2.1: Observing Internet Etiquette and Social Conventions**

##### **Supporting Data:**

- *Management Perspective*: “We mainly focus on the ethical, professional and constructive online communication and strictly follow internet ethics”
- *HR Perspective*: “Our focus is on ethical, brief and qualified comments for all the professional online interactions.”
- *Supervisor Perspective*: “We have very elementary level of understanding of applicability and rightness of the comments.”
- *Office Boy Perspective*: “We have very limited online interactions but we try to use genital and simple language.”

#### **Analysis:**

Its observed that the management and HR has shown very strong commitment to professional online interaction while others have very basic understanding of internet ethics which identified the gap for the digital literacy training programs for the employees.

#### **Sub-Theme 2.2: Abstaining from Plagiarism**

##### **Supporting Data:**

- *Management Perspective*: “Our policy is to follow the all ethical principles and copy rights so that due credit should be given to online resources.”
- *HR Perspective*: “We promote right and proper usage of reference for all reporting systems.”
- *Supervisor Perspective*: “Our understanding of referencing and giving due credit is very limited.”
- *Office Boy Perspective*: “Our Usage of online interaction is very seldom we mainly depends on our supervisors.”

#### **Analysis:**

As the management and HR show great knowledge about the copy rights and plagiarism, the supervisors and office boys has very basic level of understanding about these concepts. This shows the need of a training program on the ethical use of digital channels.

#### **Theme 3: Digital Strategy and Adaptation**

##### **Description:**

This theme explores how different roles within the organization engage with digital strategies, including online search techniques and leadership communication of the digital agenda.

#### **Sub-Theme 3.1: Online Search Strategies and Big Data Analysis**

##### **Supporting Data:**

- *Management Perspective*: “We use very advance and latest search techniques and utilize SAP for all data related quarries and also do adjustment in our strategies too when needed.”

- *HR Perspective*: “Our main focus is to work on effective search strategies and use analytical tools for getting insight of things and be able to make good decisions.” *Supervisor Perspective*: “We usually take all necessary help from the colleagues whenever we needed certain information.”
- *Office Boy Perspective*: “Our dependency is on the supervisors if needed any information.”

#### **Analysis:**

Latest digital search strategies are mainly used by Management and HR on the other hand the supervisors and office boys mostly depend upon external support for all online information. This imbalance indicated the need of training for the enhancement of digital skills.

#### **Sub-Theme 3.2: Leadership Communication of Digital Agenda**

##### **Supporting Data:**

- *Management Perspective*: “Leaders have the responsibility spread the digital agenda through meetings.”
- *HR Perspective*: “HR leaders are pivotal in digital transformation by arranging necessary training programs for employees.”
- *Supervisor Perspective*: “We usually attend the meetings to understand the digital agenda.”
- *Office Boy Perspective*: “Our learning about the digitalization come through the trainings from the leadership.”

#### **Analysis:**

Leadership has very pivotal role in promoting the digitalization through constant interaction and training. But the level of engagement is different across the different roles. The office boy shows less participation so need of specific purpose training program is necessary for the understanding of the goal.

#### **Theme 4: Practical Implementation and Training**

##### **Description:**

This theme focuses on the practical application of digital tools in daily tasks and the training provided to support their effective use across different roles.

#### **Sub-Theme 4.1: Use of Digital Tools in Daily Tasks**

##### **Supporting Data:**

- *Management Perspective*: “We integrate SAP and related digital tools to enhance efficiency and productivity.”
- *HR Perspective*: “HR uses ATS and payroll software, integrated with other digital tools, to perform various functions.”
- *Supervisor Perspective*: “Supervisors use digital tools mainly for communication and data entry, relying on IT for training.”
- *Office Boy Perspective*: “We use minimal digital tools, with basic training provided by supervisors.”

##### **Analysis:**

The integration of digital tools is most evident among Management and HR, while Supervisors and Office Boys use fewer tools and rely on IT support. This suggests a need for comprehensive training to empower all employees to use digital tools effectively in their daily tasks.

#### **Sub-Theme 4.2: Training and Support**

##### **Supporting Data:**

- *Management Perspective*: “Continuous training and IT support are crucial for sustaining digital capabilities.”
- *HR Perspective*: “HR organizes training sessions and workshops to ensure proper use of digital tools.”
- *Supervisor Perspective*: “Supervisors receive training and support to understand and utilize necessary digital tools.”
- *Office Boy Perspective*: “We receive basic training and guidance for minimal digital tool usage.”

### Analysis:

Training and support are recognized as essential across all levels, with Management emphasizing ongoing learning to maintain digital competency. However, the basic nature of the training provided to Office Boys suggests a need for more advanced, role-specific training to fully integrate them into the organization's digital framework.

### Discussion

The thematic analysis reveals key insights into the digital practices at Master Tiles & Sanitary Gujranwala. Technological integration is uneven, with managerial roles embracing a broader range of tools than non-managerial staff. Digital literacy and online behavior are commendable across the board, but there is room for improvement in terms of digital engagement among less technical roles. Leadership's commitment to a robust digital strategy is evident, yet the pace of adaptation varies among employees. Finally, practical application and training emerge as critical areas where further investment could significantly enhance the organization's overall digital competency.

### 4. Discussion:

After the thematic analysis significant disparity was identified in connection with digital literacy and technological integration in various roles at manufacturing sector of Gujranwala. Going through the data, it was found that lower level employees are confronted with challenges due to limited access and lack of digital knowledge. While answering about the perception of employee's majority expressed that digital well improved infrastructure training modules are important to be able to use latest technology to sustain in marathon without finish line in the market. The aforementioned thematic analysis revealed that the experiences and perceptions of employees manufacturing sector of Gujranwala is highly encouraging regarding their digital literacy, for implementation of industry 4.0.

In order to fill this gap, the targeted training and support by the organization is crucial to address this challenge which may lead to the productivity of the HR. The training modules will not only increase the productivity knowledge but also will

lead toward the success of the organization. The leadership's proactive approach to communicating and evolving the digital agenda plays a vital role in fostering an inclusive, digitally literate workforce.

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