



Designing Work for Human Capability: A Human Engineering Perspective on Microsign Products

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Walking across the manufacturing floor of Microsign Products on a hot May morning, Mr Nisheeth Mehta called out greetings to his staff. Machines were running smoothly, orders were steadily increasing, and the company was preparing to enter a new phase of growth. Yet, Mr Nisheeth Mehta and Microsign Products are at a crossroads.

Over the previous three decades, Microsign Products has grown from a small entrepreneurial venture into a recognized name in the fastening industry. The company's reputation for quality, reliability, and customer responsiveness in its precision-driven industry has enabled it to secure several prominent clients and establish a strong presence in the domestic market. However, the pace of growth has placed unprecedented demands on the organisation.

Advanced technology had been introduced, and much of the manufacturing process was automated. Production targets were becoming increasingly ambitious, while customers expected shorter delivery times and higher quality standards. At the same time, Mr Mehta remains deeply committed to preserving the organisational culture that had helped Microsign Products reach its current position.

For him, the challenge is not simply one of increasing production capacity. It is a question of how to scale up the organization while maintaining its current systems and processes where people and technology work together effectively. As the employer where 'persons with disabilities' make up the majority of the workforce, can Microsign maintain its people-centric values while pursuing aggressive growth?



These questions reflect a broader concern that had occupied Mr. Mehta throughout his entrepreneurial journey. Being a lifelong practitioner of *karmayoga*, he has believed that organizational success depended not merely on machines, systems, or financial resources, but on the ability to understand human capabilities and design work environments that enabled people to perform at their best; that adopting a giver's personality would lead to a better society. As Microsign Products prepares for its next stage of growth, this belief will be tested once again.

The decisions he makes in the coming months will shape not only the future of Microsign Products but also determine whether the company's distinctive approach to balancing productivity and people can continue to thrive in an increasingly competitive business environment.

Microsign Products – A History

Microsign Products, a prominent small and medium enterprise (SME) based in Bhavnagar, Gujarat, was established in 1979 by Nisheeth P. Mehta, a trained engineer and entrepreneur. The company began operations by producing plastic fasteners, clips, clamps, and closures, primarily for the electronics industry.

Over several decades, Microsign Products grew significantly and diversified. The company expanded its product line to meet the specialized requirements of the automobile, defence, telecommunication, packaging, and space research sectors; sectors that demand high precision from their suppliers as well.

By 2015, the organization had established itself as a market leader in Western India, serving as a sole seller of products like adhesive clips and cables to major corporations such as Honda, Tata Motors, and Siemens (Vohra & Saxena, 2015).

The company operated from a single three-story building for its first 35 years, until May 2015, when it transitioned to a new 2,000-square-yard facility on the outskirts of Bhavnagar. This move provided ample space for manufacturing, warehousing, and administration, as well as for future



expansion. To maintain its competitive edge and meet stringent quality standards, the company also began a technological upgradation process in 2015, including investment in high-tech, higher-capacity machines and advanced German equipment (Aggarwal & Kunwar, 2020).

History of Inclusive Employment

A defining characteristic of Microsign's history is its long-standing commitment to social inclusion. In 1988, Mr Mehta launched a unique social experiment by intentionally employing differently-abled individuals to integrate them into the mainstream business sector and promote self-reliance (Hiranandani, Kumar, & Sonpal, 2011). This initiative was undertaken nearly a decade before the Indian parliament passed the Persons with Disabilities Act in 1995.

Mr Mehta's experiment was guided by his belief in doing his bit for the betterment of society. But he does not frame his actions as those of charity. He sees this decision as a win-win for both parties. Firmly, he states his observations about the 'differently-abled' people.

Table 1: Qualities of differently-abled employees

Attribute	Behaviours of Specially/Differently-Abled Employees
Mind-set	Ownership and fighter spirit; desire to prove worth.
Commitment	100% effort; high loyalty; rarely need supervision.
Focus	Deep concentration on tasks; "extraordinary" focus.
Desire vs. Merit	Small gap between desire and deserving.

Table prepared on the basis of the author's inferences drawn from personal interactions with Mr Nisheeth Mehta

Mr Nisheeth Mehta firmly believes impairments could be overcome through appropriate job modifications and by matching specific abilities to the right tasks. And this is recognized as the 'human engineering approach'.



Human Engineering Philosophy

Traditional approaches to industrial efficiency are known to begin with the requirements of the production system and ask:

“What kind of worker do we need to perform this job?”

Human Engineering, on the other hand, adds a different question:

“How can we design this job so that a person with particular capabilities can perform it safely, effectively and productively?”

The Human Engineering Approach, also called the Ergonomics approach, is considered to be more inclusive as it is concerned with designing work, workplaces, tools, technologies, tasks and organizational systems so that they are compatible with the capabilities, characteristics and limitations of human beings.

The International Ergonomics Association (IEA) defines ergonomics or human factors (EHF) as “the scientific discipline concerned with understanding interactions between people and other elements of a system and applying principles, data and methods to design in order to optimise both human well-being and overall system performance” (What is Ergonomics?, 2026).

The central idea that of this definition is that instead of forcing the person to fit the job, Human Engineering attempts to design or redesign the job and work system to fit the person.

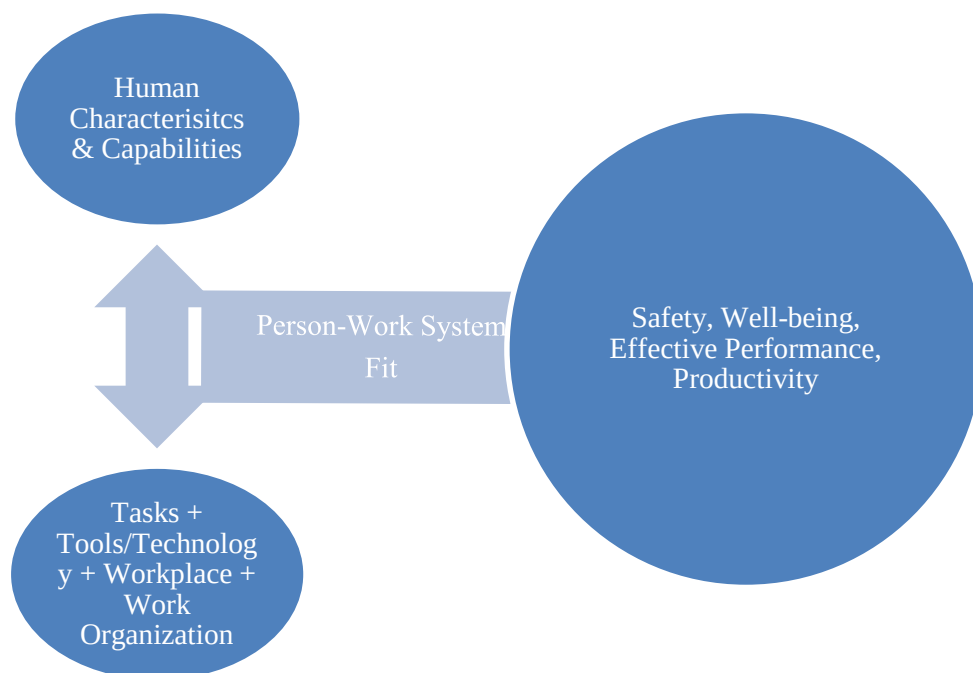
The ILO’s terminology is also helpful. The ILO uses Human Engineering as an alternative label to Ergonomics and describes them as “the optimal adaptation of the physical environment to human activity, directed toward achieving productivity while minimizing effort, fatigue and inconvenience” (ILO Thesaurus, n.d.).

Thus, Human Engineering is not simply about making employees “comfortable.” It seeks simultaneous optimization of two outcomes: human well-being and system performance

One can see how crucial both these outcomes are. A workplace intervention that improves comfort but seriously damages productivity would not represent good Human Engineering. Similarly, a production system that maximizes output while imposing unreasonable physical or cognitive demands on workers would be considered poorly designed.

The Human Engineering philosophy does not eliminate employee selection, training, or performance standards. Rather, it recognizes that performance is produced through an interaction between the person, task, technology, workplace and organization. The relationship can be depicted as below.

Diagram 1: The Human Engineering Philosophy



Human Engineering as a Systems Approach

Today, Human Engineering is not limited to simply designing a better chair, handle, machine or workstation. It adopts a systems perspective.



According to the ILO, three characteristics distinguish modern-day Human Engineering interventions:

- i. a systems approach;
- ii. a design-driven approach; and
- iii. simultaneous optimization of performance and well-being.

Therefore, suppose an employee finds it difficult to operate a machine. Human Engineering would not immediately conclude that the employee lacks ability. It would investigate the entire system:

Employee → Task → Machine → Workstation → Instructions → Work pace → Supervision → Physical environment → Organizational system

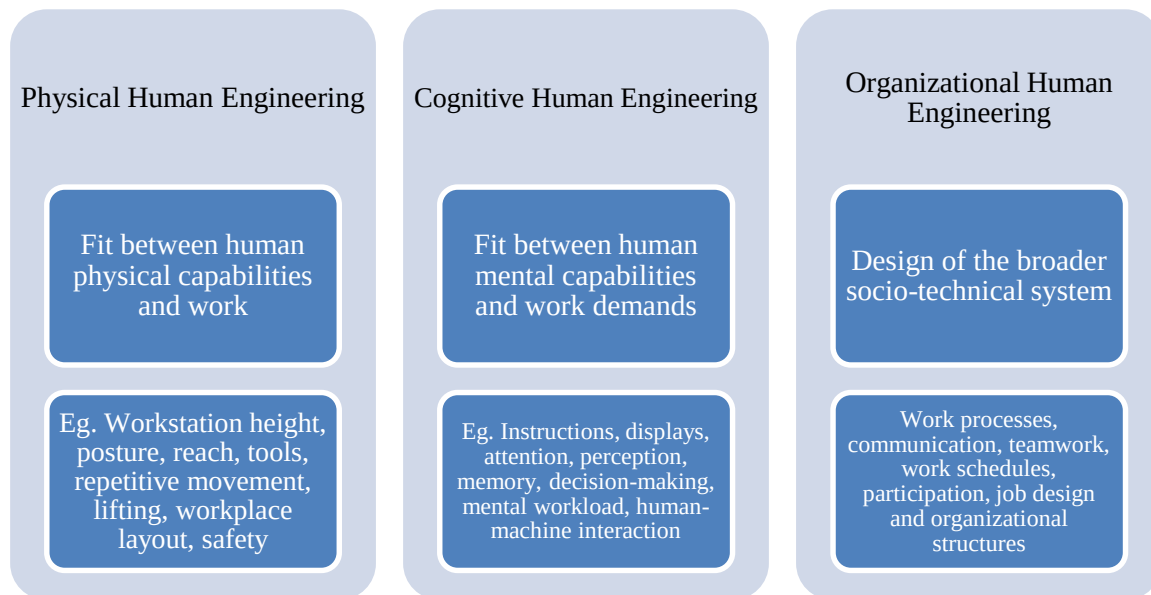
The problem might lie in the height of the machine, the force required to operate it, confusing controls, inadequate lighting, repetitive movements, excessive workload, poor training, information overload or even the way the work itself has been organized.

This perspective is highly relevant to inclusive employment, because it changes the managerial question from “Can this individual perform a conventionally designed job?” to “How might the work system be designed so that this individual can perform effectively?”

The Three Dimensions of Human Engineering

The IEA recognizes three broad domains: physical ergonomics, cognitive ergonomics and organizational ergonomics (What is Ergonomics?, 2026).

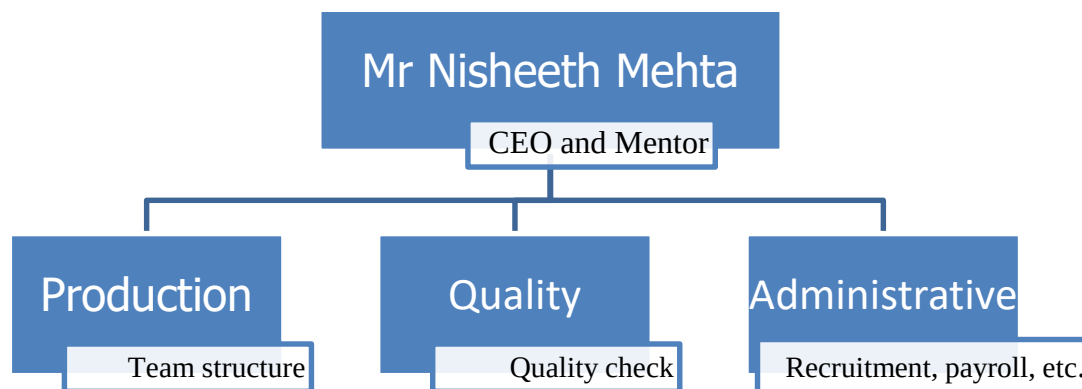
Table 2: Dimensions of Human Engineering



Application of the Human Engineering Approach at Microsign Products

Microsign Products is a small and medium enterprise (SME) and is managed as a privately held business. The structure is very simple and flat; just two levels. Mr Nisheeth Mehta and his son Mr Pathik Mehta are at the top, and Production, Quality Check, and Administration, at the next level.

Diagram 2: Microsign's organizational structure



Microsign Products currently has between 75 and 80 employees, spread across the three departments. 37 of these employees are persons with disabilities.

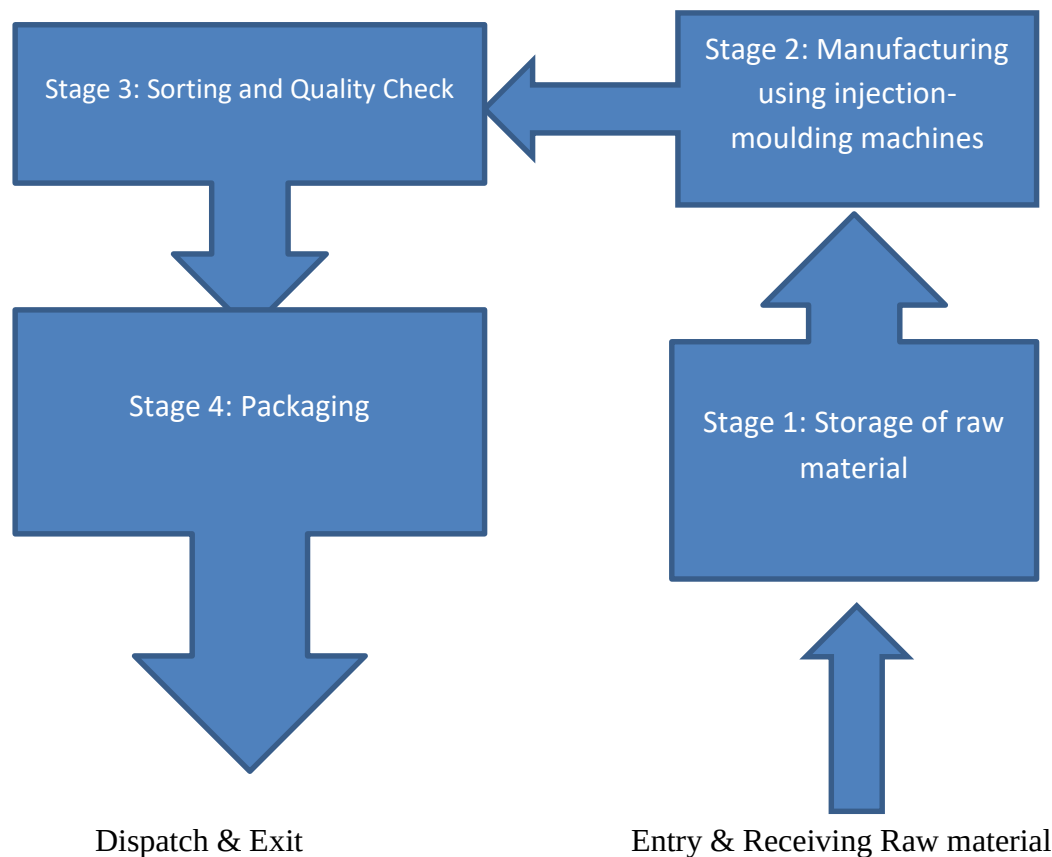
Table 3: Manpower composition at Microsign Products

Category	Number of employees
Normal employees	39
Employees with orthopaedic disabilities	22 - 24
Speech & Hearing Impaired employees	8
Mentally challenged employees	6
Visually impaired employees	1

Table prepared on the basis of personal interactions with Mr Nisheeth Mehta

Microsign's manufacturing system has injection-moulding machines imported from Japan and the plant has the functional layout, where similar functions are grouped into specific departments. These are on the ground floor with ramps making this floor completely accessible to wheelchairs. Staff with orthopaedic disabilities and visual impairment, works at the ground floor.

Diagram 3: Microsign's layout of the manufacturing floor at the ground level





The first floor houses the administrative offices, conference hall, and offices of Mr Nisheeth Mehta and Mr Pathik Mehta.

The Japanese machines are very sophisticated each machine has a small team of 4 – 6 employees working on it. More employees are required at the sorting and packaging departments.

Recruitment is also straightforward. References from current and former employees, and Microsign's reputation as an employer of the differently-abled who are treated with dignity and respect, translate into a steady supply of manpower. A local school for the differently-abled, is also their source of recruitment.

Literacy and strength of the upper limbs are the criteria for selection. Senior, 'normal' employees provide on-the-job training and mentor the new 'differently-abled' recruits.

Tasks are assigned to employees, taking into consideration their physical and mental capabilities. For instance, the hearing-impaired employees are assigned to high-noise injection moulding machines where the sound does not affect their productivity. Orthopaedically challenged employees were placed at stationary workstations for sorting and packaging tasks.

The mentally challenged employees are given repetitive tasks involving minimal concentration, such as separating fasteners from runners.

Heights at which tools, equipment, and signage are kept, water facilities are arranged, and knobs and handles of doors are placed all display consideration towards the needs of the different employees. Instructions and signs are in the local language. Images and pictures are also used. For the visually impaired employee, verbal communication is used, while with the hearing and speech impaired, communication happens by 'signing' and using gestures as well.



Organizational Impact and Recognition

Microsign's impact has gained international academic and professional recognition, serving as a case study for institutions such as the Indian Institute of Management Ahmedabad (IIMA) and being presented at global forums like the International Labour Organization (ILO) in Geneva. They have received accolades from the Federation of Indian Chambers of Commerce and Industry (FICCI), and other Government and Private organizations, for their exemplary work.

Today, the company is viewed as a successful model of purpose-driven branding, demonstrating that social responsibility can coexist with economic viability and market leadership

At the crossroad

Mr Nisheeth Mehta and his family have remained true to themselves and have lived by their conviction towards *karmayog*. They endeavoured to understand human capabilities and designed the work environment at Microsign Products such that it enabled people to perform at their best; out of the belief that adopting a giver's personality would lead to a better society.

Now they are at a cross road. Automation by investing in the Japanese machines has helped them speed up production. But to truly meet their clients' requirements and match supply with demand, Mr Nisheeth Mehta has to find a way to increase the speed of packaging done manually by the differently-abled workforce, without increasing manpower and without giving up his beliefs and convictions.

Questions for discussion:

1. Discuss how performance at Microsign Products is derived through an interaction between the persons, tasks, technology, workplace and the organization or work.
2. Based on the case description, which of the dimensions of Human Engineering do you see applied at Microsign Products? How?



3. At Microsign Products, how are jobs designed and how is communication managed, fulfilling the principles of human engineering?

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