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Conscious Industry 5.0 A Framework for Human-Centred and Regenerative Transformation

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Abstract

Industry 5.0 extends the technology-oriented logic of Industry 4.0 by placing human-centricity, sustainability and resilience at the centre of industrial development. However, these three principles do not fully explain how industrial organisations should develop ethical awareness, higher purpose, stakeholder sensitivity and responsibility for the long-term consequences of their decisions. This exploratory conceptual paper proposes **Conscious Industry 5.0 (CI 5.0)** as an expanded version of Industry 5.0. Conscious Industry is defined as an industrial system that uses advanced technology with deliberate awareness of its purpose, impacts and responsibilities toward employees, customers, investors, supply-chain partners, communities, future generations and the natural environment. The study uses an integrative and exploratory review of Industry 5.0, stakeholder theory, conscious capitalism, responsible innovation, circular economy, shared value and planetary-boundary literature. Based on conceptual synthesis, the paper proposes six dimensions of CI 5.0: higher purpose and ethical orientation, human flourishing, stakeholder co-creation, responsible human–technology symbiosis, regenerative circularity, and adaptive resilience with reflective learning. A five-stage Conscious Industry Maturity Model is also proposed, ranging from efficiency-driven automation to conscious ecosystem leadership. Seven research propositions explain how the dimensions may influence trust, innovation, employee well-being, ecological performance, resilience and long-term competitiveness. The paper contributes to conscious business management by providing a researchable framework through which Industry 5.0 may be transformed from a mainly human-centred industrial policy into a purpose-led and systemically responsible business paradigm.

Keywords: *Industry 5.0; Conscious Industry; conscious business; human-centricity; stakeholder value; responsible technology; regenerative business; industrial sustainability*

1 Introduction

Industrial development has historically been explained through changes in production technology.

Mechanisation shaped the first industrial revolution, mass production the second, automation and computing the third, and cyber-physical systems, artificial

intelligence, the Internet of Things and advanced analytics became the foundation of Industry 4.0. These technologies improved productivity and connectivity, but also raised concerns regarding employment displacement, surveillance, skill inequality, environmental pressure and algorithmic opacity.

Industry 5.0 emerged as a response to these limitations. The European Commission presented Industry 5.0 as a complementary development to Industry 4.0, organised around three broad principles: human-centricity, sustainability and resilience. It shifts industrial attention from shareholder value alone toward broader stakeholder value and places worker well-being and planetary limits within the industrial transformation agenda (Breque et al., 2021). Researchers similarly distinguish Industry 4.0 as mainly technology-driven and Industry 5.0 as increasingly value-driven (Xu et al., 2021). Industry 5.0 therefore represents an important correction to industrial strategies that treat technological advancement as an end in itself.

Nevertheless, a conceptual limitation remains. Human-centricity may improve job design without questioning

the wider purpose of production. Sustainability may be reduced to compliance, efficiency or carbon reporting rather than ecological regeneration. Resilience may protect the continuity of an organisation even when its products, business model or supply chain create undesirable social consequences. An organisation may therefore appear human-centred, sustainable and resilient while remaining ethically passive, narrowly profit-oriented or unaware of the indirect effects of its decisions.

This paper argues that the next development within Industry 5.0 should be a **consciousness layer**. Consciousness in this context does not refer to an abstract spiritual claim. It refers to an organisation's disciplined capacity to remain aware of why it exists, whose interests it affects, what consequences it creates, which values guide its choices, and how it learns from changing social and ecological conditions. On this basis, the study proposes Conscious Industry 5.0 as a new conceptual version of Industry 5.0 suited to the field of conscious business management.

2 Literature Review and Conceptual Foundations

2.1 From Technology-Driven Industry 4.0 to Value-Driven Industry 5.0

Industry 5.0 does not reject Industry 4.0 technologies. Instead, it reorients their use. Artificial intelligence, robotics, digital twins, additive manufacturing, blockchain, edge computing and advanced analytics remain important, but their legitimacy is judged by the human, social and ecological value they create. Nahavandi (2019) described Industry 5.0 through cooperation between humans and intelligent machines, in which robots act as collaborators rather than simple replacements for labour. Maddikunta et al. (2022) examined its enabling technologies and applications across manufacturing, healthcare and supply chains.

The European understanding broadened the concept beyond human-robot collaboration. Human-centricity requires technology to serve people and strengthen human capabilities. Sustainability requires industrial activity to operate within ecological limits and support resource-efficient systems. Resilience requires organisations and supply chains to anticipate, absorb and adapt to disruptions. Ivanov (2023) integrated these three principles within a viability-based framework for operations and supply chains. Adel (2022) similarly recognised Industry 5.0 as a societal industrial transition involving human-centred solutions as well as technological and governance challenges.

Industry 5.0 scholarship has therefore moved from a narrow discussion of collaborative robotics toward a broader socio-technical model. Yet recent research also identifies tensions within human-centricity. These include conflicts between productivity and worker autonomy, technological assistance and surveillance, personalisation and privacy, and human oversight and algorithmic speed (Pacheco & Iwaszczenko, 2024). Human-centric artificial intelligence architectures have been proposed to strengthen trust, explainability, user feedback and humans-in-the-loop (Rožanec et al., 2023). Such developments show that values must be embedded in technology design rather than added after implementation.

2.2 Stakeholder Value, Conscious Capitalism and Shared Value

Stakeholder theory provides an important foundation for expanding Industry 5.0. Freeman (1984) argued that strategic management should consider the groups that affect or are affected by the organisation. This perspective challenges the assumption that the firm exists only to maximise shareholder returns. The European Commission's Industry 5.0 approach follows a related shift from shareholder value to stakeholder value.

Conscious capitalism develops this argument through four connected ideas: higher purpose, stakeholder orientation, conscious leadership and conscious culture (Mackey & Sisodia, 2013). Its central premise is that profit remains necessary but should be treated as an outcome and enabling condition of value creation rather than the exclusive purpose of business. Porter and Kramer's (2011) concept of shared value likewise argues that business competitiveness and social improvement can be pursued together when organisations redesign products, markets, value chains and local ecosystems.

2.4 Research Gap

These perspectives contribute something that is not sufficiently explicit in Industry 5.0: organisational intention. Two firms may use the same clean technology and employee-friendly automation, but their deeper purposes, governance practices, stakeholder relationships and willingness to accept responsibility may differ significantly. Conscious Industry therefore requires not only beneficial outcomes but also an aware and accountable process through which priorities are selected.

2.3 Sustainability, Circularity and Responsible Innovation

The triple-bottom-line approach encouraged organisations to consider economic, social and environmental performance together (Elkington, 1997). Circular-economy research later defined industrial sustainability through the slowing, narrowing and closing of material and energy loops (Geissdoerfer et al., 2017). However, circularity can still be pursued mainly as a cost-saving or resource-security strategy. A conscious industrial model should move beyond reducing harm toward regenerative value creation, where industrial activity contributes to restoring ecological and social systems.

The planetary-boundaries framework demonstrates why incremental improvement alone may be insufficient. It identifies biophysical thresholds within which human societies can operate more safely (Rockström et al., 2009). Responsible innovation adds a governance perspective by requiring anticipation, reflexivity, inclusion and responsiveness in the development of science and technology (Stilgoe et al., 2013). These ideas support a deeper version of Industry 5.0 in which organisations consider foreseeable consequences, affected groups, alternative technological pathways and the reversibility of harm before decisions are locked into industrial systems.

Existing Industry 5.0 literature provides strong foundations in human-centricity, sustainability, resilience and advanced technology. However, three gaps are visible. First, the literature gives limited attention to higher organisational purpose and conscious leadership as antecedents of Industry 5.0 practices. Second, it does not clearly distinguish between instrumental stakeholder management and genuine stakeholder co-flourishing. Third, the

framework lacks an explicit mechanism of organisational self-awareness through which firms examine hidden assumptions, ethical trade-offs, externalised costs and unintended consequences.

As a result, Industry 5.0 may become a technical checklist rather than a transformation in industrial consciousness. The present paper addresses this gap by proposing Conscious Industry 5.0 as an integrative business-management framework.

3 Research Objectives and Questions

The study has the following objectives:

1. To explore the conceptual limitations of the present Industry 5.0 framework.
2. To integrate Industry 5.0 with conscious business, stakeholder theory, responsible innovation and regenerative sustainability.
3. To propose dimensions, maturity levels and research propositions for Conscious Industry 5.0.

The paper addresses the following research questions:

RQ1: How can Industry 5.0 be extended into a consciously governed industrial paradigm?

RQ2: What dimensions distinguish Conscious Industry 5.0 from conventional Industry 5.0 implementation?

RQ3: How can Conscious Industry 5.0 be operationalised and empirically examined in future research?

4 Research Methodology

The study follows an exploratory conceptual research design. This design is appropriate because Conscious Industry 5.0 is proposed as an emerging construct rather than tested as an established theory. An integrative literature-review approach was used to connect research streams that are usually studied separately. The conceptual base included Industry 5.0, human-centred artificial intelligence, stakeholder theory, conscious capitalism, shared value, circular economy, planetary boundaries and responsible innovation.

The analysis involved four stages: identifying the assumptions of Industry 5.0; comparing them with

purpose-led, stakeholder-oriented and ethically governed frameworks; synthesising related constructs into a definition and dimensional structure; and developing research propositions and a maturity model.

The paper does not claim statistical generalisation. Its contribution is analytical generalisation: the creation of a logically integrated framework that can be examined through case studies, expert interviews, scale development, structural equation modelling and cross-industry comparative research.

5 Proposed Concept of Conscious Industry 5.0

Conscious Industry 5.0 is defined as a purpose-driven, human-centred, technologically responsible, stakeholder-oriented, regenerative and resilient industrial system that maintains deliberate awareness of

the short-term and long-term consequences of its decisions and continuously aligns value creation with human dignity, social well-being and ecological integrity.

The proposed concept expands the three established pillars of Industry 5.0. Human-centricity becomes human flourishing, because merely placing a person at the centre does not guarantee meaningful work, autonomy, fairness or development. Sustainability becomes regenerative circularity, because reducing negative impact is different from restoring natural and community systems. Resilience becomes adaptive and reflective resilience, because the capacity to survive a disruption should include learning, ethical reconsideration and transformation.

A fourth area, responsible technology, makes explicit the need for explainability, privacy, safety, accountability and human agency. Two additional areas, higher purpose and stakeholder co-creation, provide the strategic and relational foundations of conscious industry.

Conscious Industry 5.0 is not presented as Industry 6.0. It is a value-deepened version of Industry 5.0. The numbering remains 5.0 because the principal

technological and human-machine infrastructure remains consistent with Industry 5.0. The difference lies in the level of awareness governing that infrastructure. For this reason, CI 5.0 should be understood as an evolutionary layer within the fifth industrial paradigm.

The concept also distinguishes consciousness from corporate communication. Sustainability reports, ESG terminology and social-purpose statements are insufficient without consistency across strategy, product design, employment, supply chains, governance incentives and measurable outcomes. A conscious organisation recognises tensions rather than hiding them.

For example, a firm may face a genuine trade-off between automation efficiency and local employment. A conscious firm makes the trade-off visible, includes affected stakeholders, examines alternatives, supports transition and accepts accountability for the final decision.

6 Dimensions of the Conscious Industry 5.0 Framework

6.1 Higher Purpose and Ethical Orientation

The first dimension concerns why the industrial organisation exists and how purpose influences resource allocation. Higher purpose does not eliminate profitability; it provides a wider reason for generating profit and guides its use. In CI 5.0, purpose should be specific enough to influence product selection, technology investment, market conduct and relationships with society. Ethical orientation requires explicit decision principles, transparent responsibility and the willingness to reject profitable actions that create unacceptable harm.

A conscious organisation repeatedly asks whether its products meet legitimate human or social needs, whether benefits and risks are fairly distributed, and whether its decisions would remain acceptable if their indirect effects became publicly visible. Purpose

therefore functions as a strategic filter rather than a promotional statement.

6.2 Human Flourishing and Meaningful Work

Industry 5.0 correctly places the worker at the centre, but CI 5.0 defines the expected result more clearly. Human flourishing includes physical safety, psychological well-being, dignity, autonomy, inclusion, continuous learning, fair reward and meaningful participation. Technology should augment human capability, remove dangerous and monotonous work, and create opportunities for judgement, creativity and skill development.

The dimension also includes contract labour, logistics providers, informal workers and employees of lower-tier suppliers. A firm cannot be considered conscious when good conditions at its own facility depend on hidden exploitation elsewhere.

6.3 Stakeholder Co-Creation and Equitable Value Distribution

Conventional stakeholder management may treat stakeholders as risks that must be controlled. CI 5.0 treats them as participants in defining and creating industrial value. Employees, customers, suppliers, investors, communities, regulators, knowledge institutions and ecological representatives should be involved according to the significance of the decision and the effects they experience.

Co-creation requires worker participation, supplier-development partnerships, community consultation and transparent grievance systems. Equitable distribution does not mean equal returns; it means that one group should not repeatedly bear disproportionate costs while another captures most of the benefits.

6.4 Responsible Human–Technology Symbiosis

Technology is central to CI 5.0 but is neither morally neutral nor automatically beneficial. Algorithms influence hiring, work allocation, quality control, credit, pricing, monitoring and access to opportunities. Responsible symbiosis requires human oversight, explainability proportional to risk, privacy protection, cybersecurity, bias testing, safe system design and clear accountability when automated decisions cause harm.

Symbiosis implies mutual enhancement: human knowledge improves technological interpretation, while technology strengthens human capacity. Meaningful human control must replace symbolic oversight of decisions employees cannot understand or challenge.

6.5 Regenerative Circularity and Planetary Responsibility

7 Conscious Industry 5.0 Maturity Model

The proposed Conscious Industry 5.0 Maturity Model contains five stages.

Stage 1: Efficiency-Driven Industry

CI 5.0 requires industrial systems to move from linear extraction and disposal toward circular and regenerative value creation. Circularity includes durability, repairability, reuse, remanufacturing, recycling, industrial symbiosis and product-service models. Regeneration goes further by seeking a net-positive contribution to ecosystems and communities, such as restoring soil, water, biodiversity, local capabilities or livelihood systems.

Planetary responsibility requires firms to consider absolute ecological limits, not only relative improvements per unit of production. A factory may become more energy-efficient while its total resource use continues to rise. Conscious industry therefore evaluates scale, rebound effects, cumulative impact and the full life cycle of products.

6.6 Adaptive Resilience and Reflective Learning

Resilience in CI 5.0 includes the capacity to prepare for disruptions, continue essential functions, protect vulnerable stakeholders, recover fairly and transform when the previous model is no longer acceptable. Redundancy, diversified sourcing, modular production, data visibility and local capabilities support operational resilience. However, reflective learning is equally important.

A conscious organisation does not ask only how to return to normal after a crisis. It asks whether the earlier normal was desirable. Learning processes should examine failures, near misses, employee concerns, community feedback and environmental signals. This converts resilience from defensive continuity into adaptive renewal.

Technology is primarily adopted to reduce cost, increase output and strengthen managerial control. Social and environmental matters are treated mainly as compliance requirements. Decisions are dominated by

productivity, profitability and operational-efficiency indicators.

Stage 2: Human-Aware Industry

The organisation improves worker safety, usability, training and human-machine collaboration. However, most decisions remain management-directed, and employees have limited participation in determining how technologies are introduced or used.

Stage 3: Responsible Stakeholder Industry

Ethical technology, stakeholder engagement, ESG integration, supply-chain responsibility and transparent governance become formal management practices. The organisation develops systems for consulting affected stakeholders and monitoring social and environmental risks.

Stage 4: Regenerative and Purpose-Led Industry

8 Research Propositions

The exploratory framework leads to seven propositions for future empirical examination.

P1: Higher-purpose alignment is positively associated with the consistency of social, environmental and economic decisions in Industry 5.0 organisations.

P2: Conscious leadership and culture positively influence the adoption of human-flourishing practices and responsible technology governance.

P3: Human-flourishing practices positively influence employee trust, engagement, learning behaviour and innovation performance.

P4: Stakeholder co-creation positively influences organisational legitimacy, relationship quality and the equitable distribution of industrial value.

P5: Responsible human-technology symbiosis positively influences technology acceptance, decision quality and operational performance while reducing ethical and social risk.

Purpose directly shapes strategy and investment. Circularity is designed into products and operations, employees participate meaningfully in decision-making, and the organisation aims to create net-positive social and ecological value.

Stage 5: Conscious Industrial Ecosystem

The organisation collaborates across sectors to transform complete value chains. It shares knowledge, supports common standards, distributes value more fairly and contributes to the resilience and flourishing of the larger socio-ecological system.

The stages are cumulative but not perfectly linear. A firm may be advanced in circular production yet weak in worker participation, or strong in purpose but weak in data governance. Future measurement should therefore assess both overall maturity and dimension-specific maturity.

P6: Regenerative circularity positively influences ecological performance, resource security and long-term competitiveness.

P7: Reflective learning mediates the relationship between organisational resilience and long-term conscious-industry performance.

These propositions may be tested by developing a multidimensional CI 5.0 scale. Possible indicators include purpose clarity, ethical consistency, employee voice, meaningful work, supply-chain fairness, stakeholder participation, AI explainability, privacy protection, circular design, regenerative impact, crisis fairness and institutional learning.

Structural equation modelling may be used to examine relationships between antecedents, CI 5.0 practices and organisational outcomes. Qualitative case studies may first be required to refine the dimensions and identify context-specific indicators.

A future empirical model may classify conscious leadership, conscious culture, stakeholder participation and responsible innovation capability as antecedent variables. The six CI 5.0 dimensions may be treated as

9 Theoretical and Managerial Implications

The paper contributes theoretically by connecting industrial-transformation research with conscious business management. Industry 5.0 explains what a desirable future industrial system should broadly achieve, whereas conscious business theory helps explain the purpose, leadership and culture required to achieve it. Responsible innovation explains how technological choices should be governed, while circular and regenerative frameworks clarify the ecological direction of industrial value creation.

CI 5.0 also changes the unit of analysis. Industrial performance is normally assessed at the level of the firm, plant or supply chain. Conscious Industry requires an ecosystem view because many industrial impacts occur outside formal organisational boundaries.

For example, a company may reduce its direct emissions while transferring carbon-intensive work to suppliers. It may introduce automation safely within its own facility but weaken regional livelihoods or increase insecurity among contract workers. Ecosystem-level analysis reduces the possibility of presenting displaced harm as genuine improvement.

For managers, the framework provides a practical sequence. First, the organisation should clarify its higher purpose and non-negotiable ethical principles. Second, it should map stakeholders and material

10 Limitations and Future Research

The paper is conceptual and does not empirically validate the proposed dimensions. Consciousness is also a complex construct that may be interpreted differently across cultures, industries and ownership structures. Future studies should conduct expert

mediating or multidimensional organisational practices. Employee flourishing, stakeholder trust, ecological performance, resilience, innovation and long-term competitiveness may be treated as outcome variables.

impacts across the product life cycle. Third, it should assess the six CI 5.0 dimensions and identify maturity gaps. Fourth, technology and operations should be redesigned through employee and stakeholder participation.

Fifth, the organisation should develop balanced indicators covering economic value, human flourishing, stakeholder trust, technology responsibility, ecological regeneration and resilience. Finally, governance systems, incentives and leadership evaluations should be aligned with these indicators.

For policymakers and industry associations, CI 5.0 suggests that industrial incentives should not be based only on automation, investment, exports and productivity. Public support may be linked to job quality, worker development, explainable high-risk AI, circular design, regional resilience, supply-chain fairness and measurable ecological restoration.

Standards and reporting systems should reward transparent progress while reducing opportunities for purpose-washing, greenwashing and superficial stakeholder consultation. Industrial policies should encourage firms to disclose not only positive outcomes but also unresolved tensions, negative externalities and transition risks.

interviews, Delphi analysis and multiple case studies before developing a standard measurement scale.

Comparative research may examine whether CI 5.0 differs across manufacturing, agriculture, healthcare, energy, digital services and small enterprises. Studies

may also compare public companies, private enterprises, cooperatives, social enterprises and family-owned organisations.

Longitudinal studies are necessary because conscious transformation involves changes in leadership behaviour, organisational routines and stakeholder relationships that may not be visible in cross-sectional data. Researchers should also examine possible negative effects, including managerial opportunism, symbolic purpose statements, excessive consultation,

11 Conclusion

Industry 5.0 has made an essential contribution by moving industrial transformation beyond automation and placing human-centricity, sustainability and resilience at its centre. However, the quality of industrial transformation ultimately depends on the awareness, purpose and responsibility with which these principles are interpreted. Conscious Industry 5.0 adds this missing layer.

CI 5.0 proposes that industrial organisations should not only become technologically intelligent but also purpose-aware, ethically reflective, stakeholder-sensitive and ecologically responsible. Its six

decision delays and conflicts between stakeholder claims.

Future studies can statistically test whether CI 5.0 produces stronger long-term performance than conventional Industry 5.0 practices. Researchers may also investigate moderating factors such as organisational size, industry type, regulatory pressure, technological intensity, leadership commitment and national culture.

dimensions and five-stage maturity model provide a foundation for future theory development and empirical validation.

Conscious Industry does not weaken competitiveness. It redefines competitiveness as the long-term capacity to create economic value while advancing human dignity, stakeholder trust, ecological integrity and collective resilience. The movement from Industry 5.0 to Conscious Industry 5.0 therefore represents a transition from the intelligent use of technology to the wise, responsible and purposeful governance of industrial systems.

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