Industry 5.0, Mass Media Exposure, and Human-Centric Development: Public Perceptions and Policy Alignment with Sustainable Development Goal 10

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ABSTRACT

The concept of Industry 5.0 has increasingly been articulated as a human-centred and socially responsible framework that aims to balance technical progress with respect, fairness, and inclusive development. In contrast to previous industrial frameworks that prioritise productivity, automation, and efficiency, Industry 5.0 centres development around human well-being. Although academics and international policy authorities have highlighted the concept's ethical and social foundations, little experimental research has examined how the general public interprets these principles in their daily lives. The majority of the public acknowledges development frameworks via their daily exposure to mass media and digital communication environments rather than through direct interaction with policy texts or theoretical discussions. Mediated communication is also crucial in assessing comprehension of what Industry 5.0 presents and whether it is consistent with broad social justice goals like Sustainable Development Goal 10, which is centred on reducing bias. Among 100 social media users, this study investigated the relationship between daily exposure to mass media and the general public's comprehension of Industry 5.0. Perceptions of inclusion, human relevance, social responsibility, and dehumanisation have all been examined using a standardised questionnaire with Likert-scale assessments. The findings demonstrate that, whereas exposure has increased public awareness, a deeper comprehension of human-centric principles has not always been fostered. The findings, moreover, showcase a disconnection between public understanding and policy ambitions. By highlighting the need for accessible, inclusive, and people-centred communication tactics for converting policy objectives into meaningful public understanding, the study advances research in mass communication and development.

Introduction

Technological development in the past has been known to be an indicator of societal development as well as economic development. Each and every industrial revolution, including automation, has been promising more convenience, productivity and efficiency. But, among these advantages, there exist serious social problems that have been caused by rapid technological advances. Because of various reasons such as employment loss, increasing inequality, and digital poverty, as well as the reduction of human agency, scholars and policymakers are asking whether technological improvement is good for society. Consequently, the need to humanise growth and make modernisation enrich the well-being of society rather than undermine it is a growing concern in the modern discourse.

The concept of Industry 5.0 has emerged as a redemption model that looks to reestablish balance between technology and human beings as a component of this expanded model. Industry 5.0 also focuses more on human-system co-operation as compared to Industry 4.0, which was largely interested in automation, artificial intelligence, and data optimisation. The paradigm recognizes that development must be ethical, inclusive, socially responsible and efficient. Rather than describing people as replaceable components of automated systems, Industry 5.0 also focuses on involvement, creativity, and dignity as the main values.

The European Commission states that Industry 5.0 is a resilient, sustainable, and people-oriented solution. These principles underline that social fairness and ecological soundness should not be compromised in an attempt to grow economically. Development should safeguard vulnerable societies and enhance standards of living. This approach is very compatible with global development agendas that are based on the Sustainable Development Goals of the UN. The particular target of Sustainable Development Goal 10 is to reduce inequality within and between societies. It requires fair accessibility of resources, equal participation and comprehensive opportunities. The two models appear to have a similar theme, as Industry 5.0 also focuses on inclusion and human well-being.

Although this is interrelated, human-centric development cannot be successful without understanding by people and creating policies. When development projects are confined to academic discourse or institutional language, it will not make much impact. To make these ideas impact people in their day-to-day activities, people at the grassroots have to be in a position to identify, understand, and relate with them. Nevertheless, most of the individuals do not deal directly with policy frameworks. Instead, they rely on mediated platforms such as internet forums, social networking platforms, and news media. These media are intermediaries that are used to translate convoluted ideas into readable narratives.

Therefore, the perception of Industry 5.0 is greatly influenced by the mass media. Whether or not audiences identify development with empowerment or exclusion depends on the type of communication—what is stressed, what language is used, and what examples are given. Communication that emphasises societal advantages and human experiences may make the paradigm seem inclusive to audiences. On the other hand, audiences could perceive messages as impersonal and remote if they continue to be technical or abstract. It is crucial to comprehend these interpretive procedures in order to assess how well the public has been informed about human-centric development.

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Few studies have looked at how regular media consumers comprehend Industry 5.0, despite the fact that academic literature has covered its conceptual underpinnings in great detail. Presumptions about public awareness remain conjectural in the absence of empirical support. Therefore, evaluating the practical effects of human-centric development narratives requires examining the connection between exposure to and perception of mass media.

Problem Statement

Although Industry 5.0 has been widely marketed as an inclusive and people-oriented framework, little empirical study has examined how the general public interprets these objectives. Specialised language that may not be relatable to everyday situations is commonly used in policy documents. Audiences may find it difficult to connect development concepts to their personal experiences when they are presented abstractly or technically. Disruptions like these can erode participation and undermine confidence in development projects.

Inequality may also be replicated through the lack of access to information. Some of them are omitted, and others that have more educational or online materials may find it easier to follow complicated structures. This situation contradicts the objectives of Sustainable Development Goal 10, which strives to reduce instead of widen inequality. It has therefore become important to examine how habitual exposure to mainstream media influences perceptions of inclusiveness, relevance and human value in the Industry 5.0 environment. This understanding contributes to the establishment of the fact that communication strategies contribute to the promotion of the goals of human-centred and equitable development.

Literature Review

The academic literature on the topic of Industry 5.0 has increased significantly during the last several years. The primary issue of initial discussions was to separate the paradigm and its predecessor, Industry 4.0. Industry 5.0 has been shown as a shift to human co-operation and moral accountability, with Industry 4.0 being more focused on automation, digitisation and efficiency as data. Academics believe that technological systems should make humans more creative rather than supplanting their creativity. In the newer studies, these concepts have been expanded by considering broader implications for society.

Melnyk et al. (2025) state that Industry 5.0 is a human-centred solution, that is, it links economic progress and the welfare of society. Hu, Li, and Chew (2025) highlighted that sustainability transition relates to human-oriented systems, arguing that social justice is required to achieve long-term progress. Shahidi Hamedani and co-authors (2024) demonstrated the importance of knowledge sharing and empowerment by pointing to the fact that these two elements are indispensable to human-centric development.

Ghobakhloo et al. (2025) discuss the fact that Industry 5.0 focuses on sustainability and human-centric approaches and ways of addressing societal issues, rather than Industry 4.0, which is more focused on automation and efficiency. It aims at achieving a balance between social development, environment, and economic well-being. The study found that Industry 5.0 can also be used to find a balance between sustainability, human-centred values, and technological advances. Further research and collaboration are needed, and more to achieve its potential since it is still mostly theoretical.

Parthasarathy et al. (2025) in their research work discuss that with technology serving as a major facilitator, Industry 5.0 represents a radical departure from Industry 4.0 and places an emphasis on sustainability, human-centricity, and resilience. Sustainability

ensures long-term viability by incorporating social, environmental, and economic aspects. Designing human-in-the-loop processes, addressing cognitive biases, ethics, concerns, psychological and social variables, growing human-centric hazards, and changing industry roles and skills are all areas of focus for human-centricity. Cobots and cognitive artificial intelligence are examples of technologies that act as fundamental enablers, improving resource optimisation, production efficiency, and product quality. They further argue that in Industry 5.0, resilience is a predicted result of the thoughtful fusion of sustainability and human-centeredness, made possible by cutting-edge technology.

The impact of traditional Chinese social networks on the career paths of internal migrant workers in modern-day China is examined in the paper "The Role of 'Guanxi' in the Career Development of Chinese Migrant Workers" by Ziatdinov et. Al (2024), which was published in Societies. While guanxi provides essential social capital for entering the urban labour market, it frequently traps migrant workers within narrow circles lacking the capital for high-level advancement. The study further explores whether these connections serve as a "springboard" for upward mobility or a "safety net" that confines workers to low-skilled sectors.

Industry 5.0 is a human-centred approach that incorporates social and environmental factors into industrial strategy, according to Alves, Lima, and Gaspar (2023). According to their study, the framework's core principles are sustainability and dignity. Davim (2025) went on to say that contemporary industrial paradigms need to put resilience and long-term well-being ahead of immediate productivity increases. According to these viewpoints, social results as well as economic indicators should be used to assess development.

There is still a dearth of empirical studies on public interpretation in spite of these conceptual advancements. Scholarship on mass communication sheds pertinent light on the need for this kind of study. According to framing theory, how problems are framed affects how people perceive them. By emphasising particular characteristics, media representations structure meaning rather than just transmitting information. As a result, how narratives are presented may affect how the general public views development.

Modoni and Sacco (2023), in their study titled "A Human Digital Twin-based framework driving Human centricity towards Industry 5.0", have studied human centricity led by the concept of the existence of digital twins. In order to orchestrate human-centred processes toward Industry 5.0, they proposed a paradigm based on digital twins. They said that their suggested framework went beyond the conventional paradigm of the factory's digital twin, which failed to sufficiently take into account the human element by incorporating employees and their digital copies into the digital twin's loop. The authors' overall objective is to give manufacturing companies a reference architecture for a digital-twin-based platform that monitors, simulates, and optimises human-machine (physical and virtual) interactions in order to foster harmonisation and orchestration. Furthermore, given that the digital twin is not always completely autonomous and may need human assistance, the platform improves stakeholder interactions with it. The validity of the suggested approach as a whole is demonstrated by the paper's implementation of a scenario that complies with the requirements of the suggested framework and is confirmed by an actual case study conducted at a factory plant that makes wooden furniture.

Onyemelukwe et al. (2023), in their research named "Exploring Human Centricity in Industry 5.0: A Systematic Review", examine in detail the way Industry 5.0 has influenced and shaped human centricity. They methodically assessed literature that

looks at the evolution, enabling technologies, and implications for further research of the idea of human centricity in the context of Industry 5.0. They analyze in their research how, through programs like Operator 4.0, Industry 4.0 advanced toward human-centricity after originally concentrating on technology. Also, they overviewed how the shift from Industry 4.0 to Industry 5.0 emphasises how CPS has become more human; collaboration between information systems, technology, and people is improved by HCPS.

In their analysis of how disruptive technologies might help accelerate the Sustainable Development Goals (SDGs) of the UN, Kasinathan et al. (2022) make the case for the complementary integration of Industry 5.0 and Society 5.0. The authors offer a human-centred paradigm for creating smart cities and villages in both urban and rural areas by utilising technologies like blockchain and artificial intelligence. They show how these technologies can successfully address important issues in sustainable infrastructure, economic growth, and health by emphasising the confluence of industrial efficiency and social welfare.

The unequal distribution of access to information is further highlighted by research on digital inequality. According to Van Dijk (2020), differences in access, proficiency, and usage habits have an impact on how people profit from digital communication. Development messaging may unintentionally leave out specific groups if they include a lot of technical terminology. When taken as a whole, these viewpoints emphasise the necessity of empirical research that looks at how regular exposure affects perception.

Theoretical Framework

The Digital inequality perspective, Media Framing Theory, and Social constructionism have been applied in the current research to identify the influence of mediated exposure on interpretation. These two complementary models provide a comprehensive explanation of the way in which comprehension can be formed based on the communication processes and why the perceptions of the audience may be different. The Media Framing Theory states that communication focuses on certain aspects of reality and minimises others. These frames are consumed by the audiences after they are exposed to them frequently and are used by them to make sense out of issues. The choice of development as either an issue of technology modernisation or the aspect of human empowerment will depend on its contextualisation in the context of Industry 5.0. Communication in which efficiency is valued more than inclusion can make individuals confuse the concept with impersonal progress compared to social well-being. Moreover, it is a fact that meanings are created through interaction and shared interpretation according to social constructionism and are not predetermined. The development frameworks would only be significant when individuals discuss them and relate them to real life. Under this perspective, whether Industry 5.0 indeed has taken root beyond the world of policymakers is a question that rests on the opinion of the people. Based on the introduction of theoretical frameworks, this paper has selected a multi-theoretical framework to describe the shaping of the public perception of Industry 5.0 due to mass media exposure.

The combination of Media Framing Theory, Social Constructionism and Digital Inequality Perspective has enabled the creation of a comprehensive understanding of the communicative, interpretive, and structural factors that influence perception. The Media Framing Theory states that the media messages do not reflect the objective reflection of the world. Instead, communicators selectively focus on certain aspects of subjects to emphasize at the expense of others. This is a process through which information is

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interpreted by audiences. Frames influence the things that are considered important, the things that are considered relevant, and the interpretations that are accorded to ideas. When growth is purely considered in terms of efficiency, innovation or modernisation, the viewer is able to equate progress with technological improvement. Development, on the contrary, might become morally good and people-centred when the narratives focus on social inclusion, community benefits and personal stories. One of the determinants of whether Industry 5.0 is perceived as human-centred or another abstract industry label is framing.

Consequently, exposure to the media can be studied to illuminate the paradigms that are encountered and digested by individuals. Social constructionism adds to this perspective, and it focuses on how collective meaning-making and communication create social reality. This theory assumes that ideas do not have an intrinsic or fixed meaning. Instead, mutual interpretation provides meaning to things. Industry 5.0 continues to be an academic and a political construct until people can relate it to their own lives. Talks, Internet interactions, and frequent media connections all help people gain some insight into each other. The process of public perception is thus an active process of interpretation and not simply a passive outcome of information transmission. This perspective highlights the importance of studying the audience's interpretation, rather than assuming that policy definitions are necessarily determinants of understanding for the audience.

The Digital Inequality Perspective introduces another dimension of structure. Digital media opens up unprecedented access to information, but not equal access and capacities. The education, digital literacy, and socioeconomic resources also affect how people interact with and perceive mediated content. Although certain audiences might fail due to a lack of exposure or interpretive skills, others can critically examine development narratives and uncover hidden meanings. These differences may lead to unequal awareness and cognition. More importantly, these differences contradict the SDG 10 and Industry 5.0 goals of inclusiveness. Considering this perspective, the research can recognize that not all people are affected by the media exposure in an equal manner and that the fact of differences in perception may also be a manifestation of more significant structural considerations.

These three theoretical positions can provide a powerful analysis of the influence that mediated communication has on the way people perceive human-centred development when combined. Digital inequality describes why various individuals can choose to have dissimilar interpretations, social constructionism describes how meanings are produced, and framing describes how communications are packaged. This integrated model is the reason why the study focuses on the perception of the audience, as well as supports the empirical analysis of exposure and interpretation.

Objectives of the Study
To examine how routine mass media exposure relates to public perceptions of Industry 5.0 among social media users.
To assess the extent to which these perceptions align with the human-centric and inequality-reduction principles associated with Sustainable Development Goal 10.
To analyze whether increased exposure corresponds with perceptions of inclusion, relevance, dignity, or feelings of abstraction and de-humanization.

Hypotheses
H$_1$:   Greater levels of everyday mass media exposure have been positively associated

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with perceptions of Industry 5.0 as people-oriented and socially responsible.

H₂: Overall public perceptions have demonstrated only partial alignment with the inclusion and equality principles emphasized in SDG 10.

H₃: Higher levels of exposure have been associated with perceptions of development communication as abstract or impersonal, indicating potential de-humanization effects.

Methodology
Research Design
A quantitative cross-sectional survey design was chosen for the investigation. Because the study aims to quantify perceptions and investigate connections between exposure and interpretation among a specific participant group, this methodology has been deemed suitable. Systematic data gathering, statistical comparison, and objective assessment of sample trends are all made possible by quantitative approaches.

Population and Sampling
Active social media users who frequently come up with development-related content in their online spaces have been the target market. Social media platforms are important venues for daily contact, public discourse, and the spread of knowledge. As a result, people who use these platforms are a pertinent demographic to study mediated exposure. Because of logistical and temporal limitations, convenience sampling has been used. One hundred respondents freely took part in the survey. This sample method has shown to be suitable for an exploratory study and offers valuable insight into perception trends within the chosen group, even though it cannot be fully generalised to all populations.

Instrumentation
Data have been collected through a structured questionnaire. The instrument has included nineteen Likert-scale items measured on a five-point scale ranging from strongly disagree to strongly agree. The items have been designed to assess several dimensions:
perceived human relevance
perceived inclusion and fairness
perceived social responsibility
clarity and understandability of messages
perceived abstraction or de-humanization
The items' wording purposefully steers clear of extremely specialised or technical terminology. To promote accessibility and reduce respondent confusion, statements have instead concentrated on general impressions and experiences.

Reliability and Validity
In order to test the reliability of the questionnaire, a few participants participated in a pilot study of the questionnaire before its final distribution. Unclear and ambiguous items have undergone feedback revision. Internal consistency has been assessed using reliability measures, which means that the instrument measures coherent perception-related constructs. Content validity has been demonstrated by a close correspondence of the items to the theoretical framework of the study and the goals. All the questions correspond to dimensions that were discovered in the literature, and this ensures that the tool is able to sufficiently capture the concepts under investigation.

Data Collection Procedure
Data collection has been done through online distribution. Respondents completed the

questionnaire at their own free will and anonymously. They were also requested to think about the way in which they received communication about development daily between 2020 and 2025. There has been a strict use of ethical principles such as informed consent and confidentiality.

Data Analysis
The replies received were analysed using descriptive statistics and summarised the general trends. General trends of perception, frequencies, means, and standard deviations have been calculated to determine the general trends of perception. Correlation analysis has been used to determine relationships between the exposure levels and perception factors. This type of analysis has enabled the study to determine whether exposure is correlated to the sentiments of abstraction or rather human-centric interpretations.

Findings
The results indicated that there were a few interesting trends. To start with, the way the respondents understand Industry 5.0 and the development stories surrounding it are at most mediocre. In the use of social media and the internet, most of the participants have said that they have encountered discussions on innovation, development, or social change. This implies that mediation has been prevalent as an exposure. But consciousness has not necessarily been the same thing as acute understanding. A smaller number of respondents have identified a strong association of development and inclusion, equality, or human dignity, although a lot of them have associated it with modernisation and progress. There have been mixed perceptions of clarity among the participants; some noted that the messages were clear, and others mentioned having experienced ambiguity or confusion. Also, some of the respondents indicated that development communication may sometimes appear abstract or out of touch with life. Such responses suggest that even repeated exposure to communications may not always have relatable human benefits.

According to a correlation study, exposure and awareness have modest correlations, meaning that those who are exposed to more content are more likely to recognise the notion. However, greater feelings of inclusion have not always been predicted by exposure. Higher exposure has occasionally been linked to feelings of impersonality, indicating that how a communication is framed may affect how it is interpreted.

Discussion
The findings provide important insight into the perceptions of human-centric development within a situation of frequent interaction. These results show that exposure alone is not enough, which is consistent with the media framing theory. The quality and format of communications go a long way to what is interpreted. Development stories can either appear detached or technical to the audience if they prioritise abstract progress without giving concrete human benefits. As per the social constructionist perspective, the respondents have also actively constructed meanings, not passively received. Participants have developed ideas of development based on their experiences and their background knowledge. That is why the perception of various people varies.

The digital inequality perspective also underlines the reason why the understanding has not been uniform. Differences in individual engagement, digital literacy and education can also affect the extent to which a person comprehends mediated information. These dissimilarities indicate that more accommodating and reachable methods of communication are needed.

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The trends in the data indicate that accessibility and abstraction are conflicting in the present-day development communication context. Although the participants have continued to be accompanied by development-related discourses in their daily media environments, such interactions have not necessarily led to knowledge that is insightful and humanistic.

Exposure, however, has often resulted in superficial familiarity and not in understanding. This difference is significant since, being a human-oriented paradigm, Industry 5.0 is based on the internalisation of inclusive ideals along with awareness. The low relationship between exposure and the human-centric perception offers the chance that, despite all that, generalised or symbolic language can still be an important part of communication strategies. The terms such as progress, change, or development may appear abstract when they are not connected with real experiences. Without specific examples of how development improves working conditions, social interactions, or overall health, listeners are able to interpret communications as abstract institutional discourse.

Consequently, instead of encouraging involvement, even good-intentioned communication can unintentionally encourage psychological exclusion. Nevertheless, it is also to be found that participants have not altogether dismissed development narratives. Instead, they have expressed opposing views.

Most of the respondents accepted that innovation and change are crucial to the development of society, but they did not know the effects that would be brought by these processes on ordinary citizens. This ambivalence also helps to justify the importance of aligning communication procedures with the human values represented in Sustainable Development Goal 10. It must be determined that development refers to improvement in human dignity and opportunity, and not just structural change.

Another significant factor is the role played by regular media consumption. The social media sites operate based on brief, rapid flows of information. One will not have enough time to engage in thoughtful interaction since s/he has a multitude of items to go through in a short time. Such complex concepts can be summarized into brief images or brief headlines in such environments.

Due to this, such minor concepts as equity or inclusion cannot receive as much attention as dramatic or sensational elements. The structural aspect of digital media may contribute towards the development of stories being sometimes impersonal or superficial.

These findings have empirical evidence of the integrated paradigm applied in the study, and it is theoretically sound. Media framing theory explains the manner in which selective emphasis influences the interpretation process. Social constructionism holds the view that meanings do not passively exist but they are instead negotiated by individuals. The Digital Inequality Perspective focuses on the effect of the disparity in access to interpretive resources on understanding. All these perspectives when combined together demonstrate the integration of message structure, social context and individual ability to generate perception. In sum, the discussion points out the fact that it is not sufficient to increase the volume of communication on progress. Of more concern is how such communication is structured, contextualised and humanised. Messages may focus on stories, lived experiences and societal benefits to establish a higher correspondence to the ideals of inclusion and equality.

Policy Implications

The study has various implications for communication practice and policy. To begin with, organisations that advocate for Industry 5.0 and other development projects related

to it should prioritize relatability and clarity in their communication. Bureaucratic or technical language can make other audiences bored. It is possible to understand better by replacing concrete examples with abstract terms.

Second, instead of institutional success, communication tactics should emphasise human effect. Stories on development would be more important when they focus on how policies would increase employment opportunities, social engagement and living standards. These measures conform to the objectives of SDG 10, which revolves around the empowerment of the communities that are marginalised and reducing inequality.

Third, governments should put digital literacy initiatives into consideration as a component of larger communication efforts. Increased ability of citizens to analyze the contents of media critically would reduce the misinterpretations and promote effective participation. Digital divisiveness can be reduced to enhance democracy in media systems.

Finally, a partnership with teachers, community groups, and communication experts could help in ensuring that the development messages are available to diverse audiences. The values that are human-centric could be reinforced further using a participatory communication strategy wherein communities give their perspectives and experiences.

Limitations of the Study
The important thing to note is the limitations of the study despite its contributions. The use of convenience has limited the scope of application of the results. The sample might not serve as a good representation of bigger populations that possess different demographic or socioeconomic factors, though it has provided good insight into the patterns of perceptions.

Also, the bias of response could have been established because of the utilization of self-reported data. The answers of the participants rely on their personal memories and perceptions, which are not necessarily accurate due to exposure. In future studies, the mixed methods or longitudinal method could be applied in order to enhance validity. The cross-sectional design has also been limiting in the analysis of changes across time.

With changing policy discourse and the media discourses, perceptions of development change as well. Longer-term research may allow developing a more dynamic knowledge of these processes. Being aware of such constraints enhances transparency and provides future research with a sense of direction.

Conclusion
This research has investigated the connection between popular imaginations of Industry 5.0 and habitual consumption of the media, in the broader context of Sustainable Development Goal 10. Human-centric interpretation has been highlighted over technological determinism as the study has focused on the critical role that communication can play in the construction of social conceptions of development.

Although narratives of development have been widely spread, the studies have revealed that there is still an unequal understanding. Most individuals know the concept on a shallow level and struggle to see the concept applied to the benefits of people in the real world. Such a difference means that in most cases, the process of communication gives more weight to abstraction rather than lived experience. Consequently, communication would sound unfriendly or distant, thereby lowering their capacity to foster inclusive engagement.

Consequently, the paper has highlighted that communication, which is effective and empathetic, is equally significant to the success of Industry 5.0 as innovation or policy.

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In a way that is more likely to make audiences perceive development as just and relatable, development should be introduced through stories of people, communities, and collective well-being. Media practices can be adjusted in accordance with the principles of social justice, participation and dignity to facilitate the transformation of abstract policy ideas into meaningful public realities.

Ultimately, the research contributes to the academic understanding of the relations between the media, perception, and development. It calls on legislators, educationists, and other media professionals to prioritize inclusion and clarity and be more concerned with the human side of communication. This facilitates easier achievement of the aim of a fairer and human-focused society as presented in SDG 10 and Industry 5.0.

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