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Enhancing Employee Innovation through Digital Talent Development: The Mediation of Digital Competency, Leadership and Culture in the Telecom Industry

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Abstract: In the digital economy, innovation is a strategic imperative for sustaining organizational competitiveness, with employees' innovative work behavior serving as a crucial micro-level foundation. Accelerated technological change and skill disruption have intensified the need for systematic digital talent development. Despite increasing scholarly attention to digital talent management, empirical research remains limited in explaining how digital talent development interacts with digital leadership, digital competence, and digital culture to shape innovative work behavior. This study addresses this gap by examining the structural relationships among these digital enablers within the context of digital transformation in the telecommunications industry. This study adopts a quantitative approach using survey data collected from 189 certified digital talents across PT Telkom Indonesia. Structural Equation Modeling–Partial Least Squares was employed to test the hypothesized relationships and mediating mechanisms. The results demonstrate that digital talent development influences innovative work behavior through an integrated mediating mechanism involving digital leadership, digital competence, and digital culture. This study advances the digital transformation literature by clarifying the systemic role of organizational enablers in translating digital talent investments into employee-level innovation. It emphasizes the necessity of aligning talent development with leadership capability, competency, and cultural reinforcement to support sustainable innovation in digitally transforming organizations.

Keywords: Digital Talent, Innovative Work Behavior, PLS SEM, Telecommunication Industry.

INTRODUCTION

In the digital era, innovation is widely recognized as a critical determinant for sustaining a firm's competitive advantage. It not only strengthens organizational adaptability but also ensures long-term survival within a dynamic and rapidly evolving economic landscape (Bos-Nehles et al., 2017). Moreover, innovation today is increasingly understood beyond the

organizational level, emphasizing the role of individual contributions. Hence, organizations need to actively foster and support employees in exhibiting innovative work behavior (IWB) (A. Agarwal, 2014).

Research on innovative work behavior has continued to grow and gain increasing scholarly attention. The focus of IWB studies has shifted from early approaches centered on individual traits and innovation outcomes (Korzilius et al., 2017) toward behavioral and output-oriented perspectives of work behavior (De Jong & Den Hartog, 2010). Despite this growing interest, existing IWB research remains fragmented, highlighting the need for systematic reviews to better support managerial decision making. This gap provides the primary rationale for the present study.

However, organizational efforts to foster innovative work behavior are often constrained by limitations in digital talent, particularly in terms of competencies aligned with current technological developments. At the workforce level, skill disruption is becoming increasingly evident. According to World Economic Forum (2024), global companies estimate that 39% of workers' core skills will change by 2030, reflecting the growing demand for digital readiness across industries. In particular, the telecommunications and information technology services sector is projected to face substantial training needs, with more than 60% of its workforce requiring additional skill development to remain competitive.

While previous studies have emphasized the importance of digital talent management in promoting innovative work behavior, the specific role of digital talent development remains underexplored. Digital talent development goes beyond technical skill enhancement, focusing on fostering a supportive digital culture, developing digital leadership, and building collaborative competencies that drive innovation. Building on this perspective, prior research has not adequately explained the stimultenous mediating mechanisms through which digital talent development influences innovative work behavior.

Digital competency encompasses an individual's knowledge, skills, and attitudes in accessing, utilizing, creating, and sharing digital resources efficiently, as well as in communicating and collaborating with others through digital technologies to achieve specific objectives (Perifanou & Economides, 2019). Moreover, the role of digital talent development in fostering innovative work behavior cannot be separated from the influence of digital culture and digital leadership. According to Fathony & Hendarman (2023), companies that successfully achieve digital transformation through innovation need to leverage strategy, culture, and leadership.

In communicating and promoting such strategies, organizations require skilled leaders to ensure their realization. The role of digital leadership, which encompasses innovation-oriented cognition and social capital, is crucial in advancing these initiatives (Qiao et al., 2024). Furthermore, leadership cannot be separated from the organizational culture it creates, particularly the establishment of a digital culture. In the digital era, digital culture is regarded as one of the most essential pillars of digital transformation strategies (Duma et al., 2020).

The rapid advancement of technology and digitalization has given rise to the digital economy, The telecommunications sector plays a strategic role in supporting the acceleration of ICT infrastructure development in Indonesia. One of the state-owned enterprises (SOEs) operating in the field of information and communication technology services, as well as telecommunication networks, is PT Telkom Indonesia. PT Telkom Indonesia is currently transforming into a digital telco. This transformation serves as a strategic response to the evolving digital ecosystem, particularly driven by the increasing demand from society for faster, more flexible, and more innovative digital services. These shifts present significant challenges for the organization in ensuring the effective development of digital talent. Consequently, this study investigates the effects of digital talent development, digital culture, digital competence, and digital leadership on employees' innovative work behavior.

METHODS

Sample / Participants

The primary data were quantitative in nature and collected through an online questionnaire distributed to the research sample. The sampling technique employed was non-probability sampling with purposive sampling, namely the selection of respondents based on specific criteria (Sugiyono, 2020).The criterion applied was employees who have been certified as digital talents by the company. The sample size was determined by referring to Hair et al. (2022), considering the number of measurement indicators, significance level, and the assumed R^2 value, resulting in a total of 189 respondents. Data collection was conducted from June to August 2025 through the distribution of questionnaires to employees across Telkom Holding and its subsidiaries.

Instrument

The questionnaire administered in this study was first subjected to validity and reliability assessment. Instrument validity refers to the extent to which an instrument accurately measures the constructs it is intended to assess (Creswell, 2014). An item is considered valid when its correlation coefficient (r-value) exceeds the corresponding critical value in the r-table. Validity testing in this study was performed using IBM SPSS Statistics 26. Reliability testing was conducted to evaluate the internal consistency of the instrument, ensuring that the measurement yields stable and consistent results across repeated applications (Creswell, 2014). Reliability was examined through the Cronbach's alpha coefficient, where a value greater than 0.6 for each variable indicates acceptable reliability (Ghozali, 2015).

Data Collection Analysis

Data analysis was carried out using Structural Equation Modeling–Partial Least Squares (SEM-PLS), a method that combines factor analysis, structural modeling, and path analysis (Hair et al., 2022). SEM-PLS was employed to examine the influence of digital talent development, digital leadership, digital competence, and digital culture on the innovative work behavior of employees at PT Telkom Indonesia Tbk.

The evaluation of PLS-SEM results consists of two stages, namely the assessment of the measurement model and the evaluation of the structural model. The evaluation of the measurement model (outer model) includes convergent validity, discriminant validity, and construct reliability. Convergent validity refers to the extent to which a measurement indicator demonstrates a positive correlation with other indicators measuring the same construct (Hair et al., 2022). Discriminant validity assesses the degree to which a construct is empirically distinct from other constructs. In this study, discriminant validity was evaluated using cross-loadings and the heterotrait–monotrait ratio of correlations (HTMT). Cross-loadings were examined by ensuring that each indicator's outer loading on its associated construct is higher than its correlations with other constructs (Hair et al., 2022).

The structural model evaluation aimed to assess the magnitude and significance of the relationships among latent variables, particularly the effects of exogenous constructs on endogenous constructs. This was conducted by examining the coefficient of determination (R^2) and the t-statistics obtained from bootstrapping. The R^2 value reflects the extent to which exogenous variables explain the variance of endogenous variables, indicating the model's predictive capability. Meanwhile, the significance and strength of the hypothesized relationships were determined based on the path coefficients and their corresponding t-values, providing empirical support for the proposed structural framework.

RESULTS AND DISCUSSION

Demografic profile of respondents

The demographic profile of respondents reveals that the majority were male (66,7%), while female respondents accounted for 33,3%. This composition is consistent with the overall employee structure at PT Telkom Indonesia, which remains male-dominated. In terms of age, most respondents were within the 26–30 year range (27,5%), reflecting that digital talents are largely in the early to mid-career stages and positioned within a highly productive age group.

With respect to educational attainment, most respondents held a Bachelor's degree (69,3%). This outcome reflects the company's recruitment standards, which generally emphasize undergraduate qualifications as the minimum requirement. The dominance of respondents with higher education backgrounds suggests sufficient intellectual capacity and learning ability to support continuous digital talent development initiatives.

Table 1. Respondents Demographic

Characteristics		Frequency	Percentage (%)
Gender	**Male**	**126**	**66,7**
	Female	63	33,3
Age	<25 Years	6	3,2
	26 - 30 Years	**43**	**27,5**
	31 - 35 Years	35	18,5
	36 - 40 Years	16	8,5
	41 - 45 Years	34	18,0
	46 - 50 Years	8	4,2
	> 50 Tahun	38	20.1
Education Background	**Bachelor**	**131**	**69,3**
	Master	57	30,2
	Doctoral	1	0,5
Division	**Business**	**107**	**56,6**
	Tecnology	29	15,3
	Unit Supporting	53	28,0
Job Position	Band 1	4	2,1
	Band 2	47	24,9
	Band 3	46	24,3
	Band 4	44	23,3
	Band 5-6	**48**	**25,4**
Work Tenure	**1-5 Years**	**62**	**32,8**
	6-10 Years	36	19,0
	11-15 Years	22	11,6
	16-20 Years	19	10,1
	> 20 Years	50	26,5
Employment Status	**Permanent Employee**	**169**	**89,4**
	Pro Hire	20	10,6

Source: Processed Data (2025)

Regarding organizational distribution, respondents were drawn from three key divisions: Business, Technology, and Supporting Units. The Business division accounted for the largest share (56,6%), followed by Supporting Units (28%) and Technology (15,3%). This indicates that a substantial proportion of digital talents are positioned in roles that directly contribute to business development and customer-oriented digital services.

In terms of hierarchical position, respondents were concentrated in Band 5–6 (25,4%) and Band 2 (24,9%). The representation across these bands demonstrates a relatively balanced distribution between operational-level employees, who are expected to apply digital

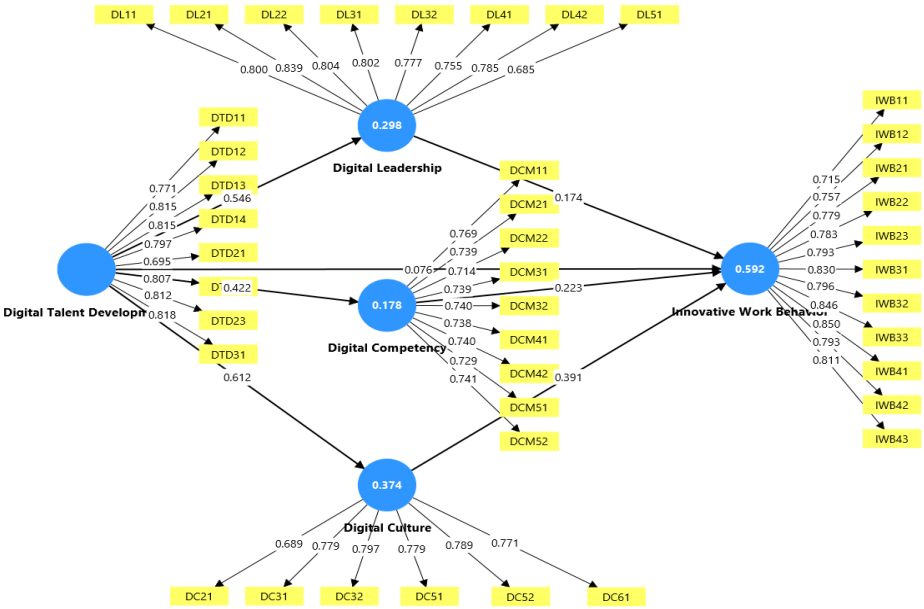
competencies under structured guidance, and managerial-level employees, who are tasked with decision-making and fostering innovation.

Work tenure data show that the largest groups of respondents had between 1–5 years of service (32,8%) and more than 20 years (26,5%). This composition suggests a workforce that combines the adaptability characteristic of younger employees with the loyalty, expertise, and organizational knowledge attributes associated with senior employees.

In terms of employment status, permanent employees accounted for the majority of respondents (89.4%), while pro-hires employees represented 10.6%. The predominance of permanent employees indicates that most respondents have been systematically integrated into Telkom's structured digital talent management framework, including formalized training and development initiatives. In contrast, the proportion of pro-hire employees reflects the organization's strategic effort to acquire specialized expertise from external sources in order to address competency gaps within specific digital domains and strengthen overall organizational capability.

PLS – SEM evaluation result

This section presents the results of the PLS-SEM analysis, particularly the assessment of the measurement model. The evaluation focuses on indicator reliability and construct validity to determine whether the empirical data adequately support the proposed model. Convergent validity is used to assess whether a measurement indicator shows a positive correlation with other indicators that measure the same construct (Hair et al., 2022). At the convergent validity stage, the evaluation is carried out by examining the values of the factor loadings for each indicator that measures the research model and the Average Variance Extracted (AVE). According to Hair et al. (2022), indicators with outer loading values between 0,40–0,70 may be considered for removal if their deletion increases internal consistency reliability (CR) or convergent validity (AVE).



Source: Processed Data

Figure 1. AVE and Construct Reliability Test Result

Based on the final calculation results, there are still several indicators with outer loading values slightly below 0,70 (DC21 = 0,683; DL61 = 0,685; DTD21 = 0,685). The test results indicate that the removal of these indicators does not improve the values of Average Variance Extracted (AVE) or Composite Reliability (CR). Therefore, the indicators were retained in the

model to preserve the theoretical coverage of the constructs. Furthermore, the evaluation for establishing convergent validity at the construct level is based on the Average Variance Extracted (AVE), with a threshold of 0,50. An AVE value of 0,50 or higher demonstrates that the construct has adequate convergent validity, as it explains more than half of the variance of its indicators (Hair et al., 2022).

Table 2. AVE and Construct Reliability Test Result

Construct	Cronbach's alpha	Composite reliability (rho_a)	AVE
Digital Competency	0,896	0,898	0,546
Digital Culture	0,86	0,863	0,59
Digital Leadership	0,909	0,912	0,612
Digital Talent Development	0,915	0,917	0,628
Innovative Work Behaviour	0,942	0,943	0,634

Source: Processed Data (2025)

Based on Table 2, all Average Variance Extracted (AVE) values for the latent variables have met the minimum threshold. This indicates that all latent variables satisfy the criteria for convergent validity, as evidenced by the proportion of indicator variance being greater than the error variance, thereby confirming that the constructs consistently represent their indicators.

Discriminant validity was tested using the Heterotrait-Monotrait Ratio (HTMT) matrix as a method to further strengthen convergent validity. The HTMT matrix test is more strongly recommended for assessing discriminant validity, as it provides a more sensitive measure against potential error (Hair et al., 2022). The HTMT matrix test was conducted by examining the HTMT values for each construct, with the standard threshold of < 0,90 (Hair et al., 2022). The results of the HTMT measurement are presented in the corresponding table.

Table 3. HTMT Matrix Test Result

Construct	DCM	DC	DL	DTD	IWB
DCM					
DC	0,865				
DL	0,817	0,828			
DTD	0,455	0,68	0,587		
IWB	0,733	0,816	0,715	0,538	

Source: Processed Data (2025)

All latent constructs in this study demonstrated Cronbach's alpha values above 0,70, indicating that the constructs used in this research exhibit good reliability. Furthermore, the composite reliability values of all constructs exceeded the minimum threshold of 0,70, which reflects strong internal consistency among the indicators in representing the same construct (Hair et al., 2022). Based on the results of the analysis, all stages of testing in the outer model fulfilled the established evaluation criteria. After establishing the adequacy of the measurement model, the study advanced to the assessment of the structural (inner) model.

The inner model analysis was conducted to assess the influence and significance of the relationships. The evaluation of the structural model consisted of examining the R^2 values and T-statistics of the estimated path coefficients. The R-square test was used to measure the extent to which the exogenous latent variables could explain the endogenous latent variables. The higher the R-square value, the greater the proportion of variance in the endogenous construct that can be explained by the exogenous constructs.

Table 4. R-Square analysis test result

Construct	R-square	Percentage
Digital Competency	0,178	17,8%

Digital Culture	0,374	37,4%
Digital Leadership	0,298	29,8%
Innovative Work Behaviour	0,592	59,2%

Source: Processed Data (2025)

The innovative work behavior variable has an R-square value of 0,592, which falls into the moderate category. This indicates that 58,2% of the variance in innovative work behavior can be significantly explained by the relevant constructs in the model. Based on the R-square analysis, it can be concluded that the model is able to explain the variance of each endogenous construct to varying degrees. This finding highlights that digital competency, digital culture, and digital leadership are critical factors contributing to the enhancement of innovative work behavior within PT Telkom Group.

Table 5. Path coefficient analysis test result

Hypothesis	Original sampel	T-statistic	P Values	Result
Digital talent development -> Innovative work behaviour	0,076	1,277	0,202	Not supported
Digital talent development -> Digital leadership -> Innovative work behaviour	0,095	1,984	0,047	Supported
Digital talent development -> Digital competency -> Innovative work behaviour	0,094	2,093	0,036	Supported
Digital talent development -> Digital culture -> Innovative work behaviour	0,239	4,611	0,000	Supported
Digital talent development -> Digital leadership * Digital competency * Digital culture -> Innovative work behaviour	0,428	8,253	0,000	Supported

Source: Processed Data (2025)

The hypothesis testing was carried out by examining the influence of exogenous latent variables on endogenous latent variables using the path coefficient values and their level of significance. The testing process employed the bootstrapping technique, producing the output of original sample values, t-statistics, and p-values for each estimated path coefficient among the variables.

Relationship between Digital talent development and Innovative work behavior

The direct effect of digital talent development on innovative work behavior yielded an original sample value of 0,076 with a t-statistic of 1,277. These findings indicate that the influence of digital talent development on innovative work behavior may be strengthened when supported by other organizational factors. In this context, digital talent development serves as an important foundation that can contribute more effectively to innovative behavior when accompanied by leadership support, a supportive organizational culture, and adequate motivational mechanisms (Janssen, 2000);(Amabile & Pratt, 2016).

World Economic Forum (2024) also emphasizes that while upskilling and reskilling are essential in the face of rapid technological change, their effectiveness depends on complementary organizational practices that allow employees to apply newly acquired skills in innovative ways. In the telecommunications industry, where technological disruption and competitive dynamics are highly complex, companies cannot rely solely on digital talent development programs. Instead, they need to integrate competency development with cultural reinforcement and leadership support to create a conducive environment for innovation. This integration ensures that employees are not only equipped with digital skills but are also empowered and motivated to transform those skills into innovative work behavior that drives organizational competitiveness.

Relationship between Digital Talent Development and innovative work behavior through Digital leadership

The effect of digital talent development on innovative work behavior through digital leadership yielded an original sample value of 0,095 with a t-statistic of 1,984, indicating a positive and significant influence. This suggests that digital talent development can only be effective in fostering innovative behaviors when supported by leaders who actively promote knowledge sharing and encourage the generation of new ideas. Digital leadership provides organizations with the capacity to identify and nurture leaders equipped with digital competencies, who can then drive and sustain innovation.

These findings are consistent with prior studies, Zang et al. (2022), emphasized that leaders are the initiators and enablers of digital initiatives within organizations, while Ambedkar & Prakash (2024), found that insufficient digital leadership skills may hinder innovation despite significant investments in talent development. Similarly, Erhan et al. (2022) highlight that leaders' ability to embrace emerging technologies and recognizes the importance of innovation is critical to organizational advancement. Within the telecommunications industry, fostering digital leadership is therefore a strategic necessity to ensure that digital competencies are effectively transformed into sustainable innovative work behaviors.

Relationship between Digital Talent Development and innovative work behavior through Digital competency

The effect of digital talent development on innovative work behavior through Digital competency yielded an original sample value of 0,094 and a t-statistic of 2,093. These results indicate that higher levels of digital competence among employees are positively associated with a greater likelihood of demonstrating innovative behaviors, such as seeking new solutions, applying technology creatively, and innovating within work processes. This finding is consistent with Liu et al. (2024), who emphasize that digital competence, as a critical work resource, directly influences innovative work behavior.

Digital competence serves as a fundamental foundation in strengthening digital talent by enabling effective collaboration, communication, and problem-solving. As highlighted by Blanka et al. (2022) , digital competence not only fosters innovative work behavior but also contributes to organizational performance by equipping employees with the necessary technical and collaborative capacities to realize innovation. In this sense, developing robust digital competencies becomes essential for organizations aiming to sustain competitiveness in an increasingly technology-driven business environment.

Relationship between Digital Talent Development and innovative work behavior through digital culture

The effect of digital talent development on innovative work behavior through digital culture shows an original sample value of 0,239 with a t-statistic of 4,611, indicating a strong positive and significant influence. A digital culture that promotes collaboration, openness to ideas, and support for experimentation creates an environment where innovation can thrive. This finding is in line with Çetinkaya & Sürücü (2025), who highlight the role of digital culture in driving innovative work behavior by fostering openness to technological change and encouraging risk-taking.

A strong digital culture motivates employees to continuously learn and explore the use of technology in their work. In contrast, environments with high uncertainty avoidance and rigid structures may hinder the generation of new ideas (Kwan et al., 2018). Companies with inclusive, flexible, and low power-distance cultures are better positioned to empower employees to explore alternative approaches and contribute to innovation (Rahman et al., 2025).

Relationship between Digital Talent Development and innovative work behavior through Digital Leadership, Digital Competency, and Digital Culture

The empirical findings reveal a highly significant result, with a t-statistic of 8,253 and a p-value of 0,000. This finding indicates that digital talent development exerts a significant influence on innovative work behavior through the joint mediating effects of digital leadership, digital competency, and digital culture. The result is consistent with Rodríguez-González et al. (2023), who emphasize that the systematic management of digital competencies, leadership, and culture is crucial to fostering a collaborative mindset, continuous learning, and a willingness to experiment, all of which form the foundation for innovative behavior within organizations.

The mediation pathway through digital leadership underscores the importance of leaders who can guide, empower, and facilitate the effective use of technology. Such leadership enhances employees' engagement in innovation-related activities, encouraging digital talents to explore novel approaches and take calculated risks in generating creative solutions. According to Fawaz Massoud et al. (2023), digital leadership plays a crucial role in managing innovative projects, enabling digital talents to channel their creativity and innovative thinking effectively to enhance the quality of organizational services and products. This suggests that digital talent development supported by structured career planning and professional growth initiatives can foster adaptive leaders who, in turn, strengthen innovative work behavior within the organization.

Similarly, the mediation effect of digital competency highlights its pivotal role in linking digital talent development and innovative work behavior. Competencies developed through talent development initiatives not only enhance technical proficiency but also strengthen employees' problem-solving, communication, and cross-functional collaboration capabilities. Consequently, digital competencies enable individuals to transform creative ideas into actionable and value-creating innovations. Digital talent development represents an effort to strengthen digital skills that are aligned with organizational objectives. When companies invest in training to enhance technological capabilities, such initiatives foster both technological proficiency and digital thinking competencies (Załoga & Bryczek-Wróbel, 2023).

Digital culture, which evolves through the interaction between talent development and leadership, further establishes a supportive environment for innovation. A culture that emphasizes collaboration, openness to change, and adaptability motivates employees to share ideas and experiment with new methods, thereby reinforcing innovative work behavior. Relevant digital development programs help talents strengthen their confidence in utilizing technology. A strong digital culture supports digital talents in exploring new ideas and technologies. The presence of such a culture prioritizes collaboration and knowledge sharing within and across teams, creating an environment where digital talents are motivated to exchange ideas and feedback (Adekoya et al., 2024); (George et al., 2016).

Overall, the simultaneous mediation of these three factors demonstrates that digital talent development lays the groundwork for digital leadership in providing direction and trust, digital competency in enhancing problem-solving and collaboration, and digital culture in cultivating a climate conducive to experimentation. Collectively, these mechanisms facilitate the translation of creative ideas into tangible innovations in the workplace. Therefore, talent development programs should not be confined to technical upskilling but must be integrated with visionary leadership, adaptive culture, and strong digital competencies to ensure sustainable innovation in digital organizations.

CONCLUSION

This study contributes to the literature on innovative work behavior by demonstrating that innovative behavior among digital talent is not solely shaped by individual-level factors,

but is strongly influenced by digitally oriented leadership, competence, and organizational culture. Based on the PLS-SEM analysis, digital talent development was found to exert a significant influence on innovative work behavior through digital leadership, digital competence, and digital culture simultaneously. However, its direct effect on innovative work behavior was not statistically significant. These findings indicate that digital talent development does not operate in isolation, rather its effectiveness depends on adaptive technology-oriented leadership, adequate digital competence, and the internalization of a supportive digital culture within the organization. With the reinforcement of these three enabling factors, digital talent development can more effectively and sustainably foster innovative work behavior.

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