# ENTERPRISE POTENTIAL FOR SUSTAINABLE GROWTH: INNOVATION CAPACITY, INVESTMENT RESOURCES, AND STRATEGIC RESILIENCE

**Viacheslav Makedon**[1]

DOI: https://doi.org/10.30525/978-9934-26-715-4-9

**Abstract.** Enterprise potential determines the ability of firms to transform available resources into sustainable economic growth under technological, financial, and market uncertainty. *The purpose* of the paper is to develop an integrated model for enterprise potential formation and realization through innovation capacity, investment resources, and strategic resilience. *Methodology* combines nonlinear normalization, adaptive weighting, multiplicative aggregation, bottleneck diagnostics, structural imbalance measurement, risk adjustment, and scenario analysis. The proposed assessment architecture differentiates resource availability from the efficiency of its economic conversion. *Results* demonstrate that enterprise potential cannot be adequately evaluated through isolated financial, technological, or innovation indicators. The developed model integrates innovation commercialization, technological renewal, knowledge absorption, financing capacity, investment productivity, operational continuity, resource adaptability, and recovery capacity. Risk-adjusted enterprise potential reflects complementarity among its three dimensions and penalizes excessive structural imbalance. Potential realization efficiency connects accumulated capabilities with economic value creation, operating cash flow, innovation output, and productivity growth. *Practical implications* concern the identification of development constraints, allocation of investment resources, selection of innovation projects, and adjustment of strategic responses under disturbances. *Value/originality* consists in combining potential assessment with its subsequent realization and renewal within a continuous management cycle supporting sustainable enterprise growth.

[1] Doctor of Economic Sciences, Professor,
Professor at the Department of Marketing and Logistics,
Oles Honchar Dnipro National University, Ukraine

© Viacheslav Makedon

## INTRODUCTION

Enterprise potential has acquired a broader economic meaning as firms face technological shifts, unstable investment conditions, shorter innovation cycles, and increasing requirements for organizational adaptability. Sustainable growth now depends not only on the volume of resources accumulated by an enterprise but also on its capacity to combine, mobilize, and reconfigure them. Financial resources, production assets, technological competencies, knowledge, human capital, and managerial capabilities generate sustainable effects only when they are integrated into a coherent development system. This perspective shifts attention from the static availability of resources toward the capacity of an enterprise to transform available opportunities into measurable economic outcomes (Giraldi & Rossi, 2026).

The relevance of the research is determined by the increasing complexity of enterprise development under digital transformation and persistent environmental uncertainty. Technological modernization expands opportunities for productivity growth, process redesign, and business model innovation. However, access to technology alone does not ensure sustainable development. Enterprises also require sufficient investment resources, innovation capacity, organizational flexibility, and mechanisms for maintaining operational and strategic continuity. The growing interdependence of these components creates a need to reconsider enterprise potential as an integrated economic category that reflects both available resources and the ability to convert them into sustainable growth (Fahziar, 2026).

The research problem arises from the fragmented treatment of enterprise potential in contemporary research. Innovation capability, digital maturity, technological readiness, financial resources, dynamic capabilities, and organizational resilience are commonly examined through separate analytical frameworks. This separation provides valuable evidence about individual development factors but does not fully explain how they interact when enterprises make investment and strategic decisions. A firm may demonstrate substantial technological capability while lacking resources for commercialization. Conversely, strong financial capacity may coexist with weak innovation mechanisms or insufficient adaptability. An integrated approach is therefore required to identify how resource, innovation, and

resilience dimensions jointly determine the capacity for sustainable enterprise growth.

Recent academic studies increasingly interpret enterprise development through combinations of capabilities rather than individual resource indicators. Garrido-Moreno et al. (2024) examined the relationship between innovation, organizational resilience, and business performance. Their study demonstrated that innovation and resilience operate as interconnected organizational mechanisms supporting performance improvement. The findings are particularly relevant for understanding why innovation resources alone cannot adequately characterize enterprise potential when the organization lacks the capacity to respond to disruptions. Gudz et al. (2024) investigated directions for developing enterprise innovation potential in the context of digital transformation. Their research emphasizes the changing composition of innovation potential as digital technologies modify internal processes and development opportunities. Wang et al. (2024), studying strategic emerging enterprises, examined configuration paths leading to innovation performance. Their results indicate that innovation outcomes depend on combinations of organizational conditions. Nevertheless, these studies primarily concentrate on innovation outcomes, while the investment resource base supporting the realization and scaling of innovation receives less integrated consideration.

Jie et al. (2025) explored the relationships among digital maturity, dynamic capabilities, and innovation performance in high-tech SMEs. The study shows that technological advancement produces stronger outcomes when supported by organizational capabilities that enable enterprises to recognize changes and reconfigure resources. Gkika et al. (2025) also analyzed the drivers of digital maturity within a business ecosystem. Their contribution clarifies the organizational prerequisites of digital transformation. However, digital maturity remains only one dimension of enterprise potential and cannot independently represent the capacity to finance, implement, and sustain strategic development.

This discussion is extended by contemporary research on technology-driven transformation. Duarte & Dong (2026) conceptualized Industry 4.0 technologies as drivers of strategic and business model innovation. Their work demonstrates that technological implementation can influence both operational architecture and value creation mechanisms.

Eicke et al. (2026) investigated strategic AI orientation and technological innovation using managerial insights and panel data. The study connects managerial orientation toward artificial intelligence with technological innovation and indicates that strategic direction influences how technological opportunities are converted into innovation activity.

The capability perspective is further developed by Nuryakin & Qamari (2026). Their research examines absorptive capacity in conjunction with innovation and technological capabilities and relates these mechanisms to SME performance. The results support an interpretation of enterprise potential in which knowledge acquisition must be complemented by mechanisms for assimilation, transformation, and commercial application. Li et al. (2026) investigated factors determining technological innovation capability in the technology industry, providing additional evidence that innovation capacity emerges from several mutually dependent organizational conditions rather than a single technological resource.

Martell-Chávez et al. (2026) considered innovation and technology management strategies associated with Industry 4.0 adoption in SMEs in developing countries. Their study draws attention to the managerial and resource constraints accompanying technological transformation. These constraints are especially important for enterprise potential assessment because the existence of technological opportunities does not imply that an enterprise possesses sufficient financial, organizational, and managerial resources for their implementation.

Njah et al. (2026) proposed a digital maturity model for manufacturing SMEs, contributing a structured approach to assessing readiness for digital transformation. Tan et al. (2026) examined digital maturity and its determinants in relation to business performance. Both studies provide evidence for treating maturity as an organizational capacity rather than simply a level of technology acquisition. Tsiavos & Kitsios (2026) further showed the importance of digital transformation strategy in converting digital ambitions into digital maturity. Taken together, these studies indicate that strategic alignment determines whether technological resources become productive organizational capabilities.

Despite substantial progress, several issues remain unresolved. Contemporary research provides detailed approaches to innovation capability, digital maturity, technological readiness, and organizational

resilience, but these categories are rarely integrated with the investment resource dimension of enterprise potential. The ability to generate an innovation idea, absorb new knowledge, or identify a digital opportunity differs from the ability to finance, implement, scale, and sustain the corresponding transformation. Likewise, resilience cannot be reduced to resistance against external shocks because sustainable growth requires enterprises to preserve development capacity while reallocating resources and renewing their business activities.

The fragmentation of these research streams creates a methodological gap between resource assessment and capability assessment. Available resources describe what an enterprise possesses, while organizational capabilities determine what it can accomplish with those resources. Strategic resilience characterizes whether these capabilities can remain functional or be reconfigured when operating conditions change. These dimensions should therefore be examined jointly rather than as autonomous characteristics.

This research addresses that gap by considering enterprise potential for sustainable growth as an integrated combination of innovation capacity, investment resources, and strategic resilience. Such an approach provides a basis for linking the availability of enterprise resources with their productive transformation, strategic allocation, and adaptive use. It also creates the analytical foundation for developing an integrated assessment system capable of identifying both existing development capacity and internal constraints that prevent enterprises from converting potential into sustainable economic growth.

**Research objective –** to develop an integrated approach for assessing and realizing enterprise potential for sustainable growth through innovation capacity, investment resources, and strategic resilience.

## 1. Formation and Assessment of Enterprise Potential for Sustainable Growth

Enterprise potential reflects more than accumulated resources available at a particular reporting date. Its economic content emerges through the capacity to combine resources, convert them into development capabilities, and preserve this conversion under changing operating conditions. Financial reserves, technologies, knowledge, production assets, and managerial

competencies therefore represent only the initial layer of potential (Lee et al., 2024). Their productive combination determines whether the enterprise can finance innovation, scale successful solutions, withstand disturbances, and maintain sustainable growth. This interpretation changes the assessment logic. A high level of individual resources does not necessarily indicate strong development potential. An enterprise can possess modern equipment but lack financing for technological renewal. Another firm may maintain substantial liquidity while demonstrating weak innovation conversion. A third enterprise can generate innovative products but remain highly vulnerable to supply disruptions or demand shocks. The assessment should capture these structural differences rather than conceal them inside one arithmetic average (Orošnjak et al., 2025).

For this study, enterprise potential is structured around three interdependent dimensions: innovation capacity, investment resources, and strategic resilience. Innovation capacity describes the ability to create, absorb, implement, and commercialize new solutions. Investment resources characterize the financial space available for development without excessive deterioration of liquidity, leverage, or cash-flow stability. Strategic resilience measures the capacity to preserve critical functions, redistribute resources, and restore the planned development trajectory after disturbances (European Bank for Reconstruction and Development, 2026; Makedon et al., 2025 b).

The first analytical task concerns the selection of indicators. Their composition should reflect not only resource availability but also conversion efficiency and development constraints. For this reason, each diagnostic block combines a stock indicator, a flow indicator, an efficiency measure, and a risk-sensitive characteristic. The resulting architecture is presented in Table 1 (Table 1).

The structure in Table 1 separates the possession of resources from their economic conversion. This distinction is central to further calculations. For example, R&D expenditure measures commitment to innovation, whereas the innovation conversion ratio captures the market productivity of that expenditure. A similar distinction applies to investment resources: available financing describes capacity, while risk-adjusted return reflects the quality of capital allocation (Stef et al., 2026).

Table 1

**Multilevel metric architecture for risk-adjusted assessment of enterprise growth potential**

| No. | Assessment block | Primary metric | Calculation basis | Normalization benchmark | Weight $w_j$ | Risk correction | Economic interpretation |
|---|---|---|---|---|---|---|---|
| 1 | Innovation financing capacity | R&D investment intensity, RDI | R&D expenditure / revenue | Strategic target and sector median | 0.11 | R&D budget volatility | Financial commitment to innovation renewal |
| 2 | Innovation commercia-lization | Innovation conversion ratio, ICR | Revenue from new products / innovation expenditure | Three-year enterprise target | 0.14 | Commercia-lization failure rate | Ability to transform inno-vation spending into market returns |
| 3 | Technology renewal | Technology renewal index, TRI | Value of renewed technological assets / technological asset base | Technology-cycle benchmark | 0.09 | Technology obsolescence rate | Speed of productive asset modernization |
| 4 | Knowledge absorption | Absorptive capacity ratio, ACR | Implemented external solutions / acquired solutions | Best internal historical result | 0.08 | Knowledge loss coefficient | Capacity to internalize external knowledge |
| 5 | Internal investment capacity | Reinvestment coverage, RIC | Retained earnings + depreciation / development CAPEX | Planned investment requirement | 0.12 | Operating cash-flow volatility | Ability to finance development internally |
| 6 | External financing capacity | Capital accessibility index, CAI | Available funding / required external funding | Full financing requirement | 0.10 | WACC and leverage adjustment | Feasibility of mobilizing external investment |
| 7 | Investment efficiency | Risk-adjusted investment return, RAIR | Expected NPV / invested capital | Required return adjusted for risk | 0.11 | Project downside deviation | Quality of investment allocation |
| 8 | Operational resilience | Continuity capacity ratio, CCR | Protected critical capacity / required critical capacity | Minimum continuity threshold | 0.09 | Supply and production disru-ption exposure | Ability to preserve core operations |
| 9 | Financial resilience | Liquidity recovery capacity, LRC | Liquid reserve / stressed cash requirement | Stress-scenario requirement | 0.08 | Cash-flow-at-risk | Capacity to absorb financial disturbances |
| 10 | Strategic adaptability | Resource reconfiguration index, RRI | Reallocated productive resources / resources requiring reallocation | Scenario-specific requirement | 0.08 | Reconfi-guration time penalty | Speed of strategic resource redistribution |

*Source: developed by the author*

Raw values cannot be aggregated directly because the indicators use different measurement scales. Their distributions also differ considerably. Linear min-max normalization remains sensitive to extreme observations and changing sector boundaries. A bounded nonlinear transformation is more suitable for heterogeneous enterprise data. For stimulant indicators, the normalized value is calculated as:

$$N_{ijt}^{+} = \left[ 1 + \exp\left( -a_{ij} \frac{X_{ijt} - B_{ij,t}}{\sigma_{ij,t} + \varepsilon} \right) \right]^{-1} \quad (1)$$

where:

$N_{ijt}^{+}$ – normalized stimulant indicator $j$ for component $i$ in period $t$;

$X_{ijt}$ – actual value of the indicator;

$B_{ij,t}$ – target or economically justified benchmark;

$\sigma_{ij,t}$ – rolling standard deviation of the indicator;

$a_{ij}$ – sensitivity parameter determining transformation steepness;

$\varepsilon$ – stabilizing constant.

Equation (1) assigns greater analytical weight to deviations occurring near the target zone. Extremely high values no longer increase the integral assessment indefinitely. This property matters for liquidity, innovation expenditure, and investment intensity because excessive values can indicate inefficient resource accumulation. Destimulants require an inverse specification:

$$N_{ijt}^{-} = \left[ 1 + \exp\left( a_{ij} \frac{X_{ijt} - B_{ij,t}}{\sigma_{ij,t} + \varepsilon} \right) \right]^{-1} \quad (2)$$

where:

$N_{ijt}^{-}$ – normalized destimulant indicator;

$X_{ijt}$ – observed value of the risk or cost characteristic;

$B_{ij,t}$ – admissible benchmark;

$\sigma_{ij,t}$ – rolling volatility measure;

$a_{ij}$ – response sensitivity coefficient;

$\varepsilon$ – numerical stabilization parameter.

The next stage concerns aggregation inside each potential dimension. A conventional weighted mean can hide critical deficits. High innovation intensity, for example, can mathematically compensate for poor commercialization. Economically, such substitution is questionable

(Thornhill, 2006). The model therefore combines weighted geometric aggregation with a bottleneck penalty:

$$C_{it} = \left( \prod_{j=1}^{m_i} N_{ijt}^{w_{ij}} \right) \left[ 1 - \lambda_i \left( 1 - \min_j N_{ijt} \right)^{\kappa_i} \right], \sum_{j=1}^{m_i} w_{ij} = 1 \quad (3)$$

where:

$C_{it}$ – composite value of potential dimension $i$;

$N_{ijt}$ – normalized value of indicator $j$;

$W_{ij}$ – weight assigned to the corresponding indicator;

$m_i$ – number of indicators within dimension $i$;

$\lambda_i$ – bottleneck penalty intensity;

$\kappa_i$– nonlinear sensitivity to the weakest indicator.

This construction captures a practical management problem. Potential cannot expand indefinitely when one critical capability remains underdeveloped. The weakest indicator therefore produces a nonlinear penalty rather than disappearing among stronger variables.

At this stage, three composite values are obtained: $IC_t$ for innovation capacity, $IR_t$ for investment resources, and $SR_t$ for strategic resilience. Their values should be interpreted jointly. The same integral score can conceal entirely different configurations, which require different managerial responses. Table 2 connects quantitative states with identifiable resource gaps and investment decisions (Table 2).

Table 2 gives the integral assessment an applied managerial interpretation. For instance, configurations 2 and 4 may produce similar average potential values, although their economic problems differ. The first requires financing instruments. The second requires resilience investment, supply diversification, and recovery capacity. Treating them as one category would lead to different, and often inefficient, capital allocation decisions. The interaction among the three dimensions should also enter the calculation explicitly. Innovation capacity becomes economically productive when investment resources support implementation. Both dimensions lose part of their value when strategic resilience remains weak (Makedon et al., 2025a). For this reason, enterprise potential is calculated through a synergy-adjusted multiplicative function:

Table 2

**Scenario matrix for diagnosing structural configurations of enterprise potential**

| No. | Configuration | $IC_t$ | $IR_t$ | $SR_t$ | Dominant economic constraint | Priority allocation decision | Monitoring trigger |
|---|---|---|---|---|---|---|---|
| 1 | Synchronized growth | ≥0.75 | ≥0.75 | ≥0.75 | No critical internal bottleneck | Scale innovation and market expansion | Decline of any component below 0,70 |
| 2 | Innovation without capital | ≥0.75 | <0.50 | ≥0.60 | Financing deficit | Refinance project portfolio and attract long-term capital | Funding gap exceeds planned CAPEX reserve |
| 3 | Capital accumulation trap | <0.50 | ≥0.75 | ≥0.60 | Weak innovation conversion | Shift capital toward R&D and commercialization | Innovation revenue remains below target |
| 4 | Fragile innovation expansion | ≥0.70 | ≥0.60 | <0.50 | Exposure to disruption | Build liquidity, supply, and capacity reserves | Recovery horizon exceeds target |
| 5 | Resilient technological lag | <0.50 | ≥0.55 | ≥0.75 | Technology and knowledge deficit | Accelerate technology renewal and capability acquisition | Technology gap exceeds one renewal cycle |
| 6 | Investment overextension | ≥0.55 | <0.50 | <0.50 | Debt and liquidity pressure | Suspend marginal projects and restore cash buffers | CFAR breaches liquidity reserve |
| 7 | Unbalanced transition | ≥0.65 | ≥0.65 | 0.50–0.65 | Slow organizational adaptation | Redirect part of CAPEX toward process flexibility | Reconfiguration time rises |
| 8 | Latent growth potential | 0.50–0.65 | ≥0.65 | ≥0.65 | Weak resource conversion | Improve commercialization and project selection | Potential realization ratio declines |
| 9 | Structural potential erosion | <0.50 | <0.50 | <0.50 | Simultaneous capability deficit | Stabilize cash flow before development expansion | Two consecutive periods below 0,50 |

*Source: developed by the author*

$$EP_t = IC_t^{\alpha} IR_t^{\beta} SR_t^{\gamma} \left[ \begin{matrix} 1 + \theta_1 IC_t IR_t + \theta_2 IC_t SR_t + \\ + \theta_3 IR_t SR_t + \theta_4 IC_t IR_t SR_t \end{matrix} \right] e^{-(\mu R_t + \nu V_t + \xi G_t)} \quad (4)$$

where:

$EP_t$ – integrated enterprise potential;

$IC_t$ – innovation capacity index;

$IR_t$ – investment resources index;

$SR_t$ – strategic resilience index;

$\alpha, \beta, \gamma$ – structural weights, where $\alpha+\beta+\gamma=1$;

$\theta_1, \theta_2, \theta_3$ – pairwise synergy parameters;

$\theta_4$ – three-dimensional complementarity parameter;

$R_t$ – aggregated strategic risk exposure;

$V_t$ – volatility of the internal indicator system;

$G_t$ – structural imbalance coefficient;

$\mu, \nu, \xi$ – risk sensitivity parameters.

The $G_t$ parameter requires a separate calculation because dispersion among components affects development feasibility. A firm with values of 0.90, 0.85, and 0.25 has a different strategic position from a firm with three values near 0.67, even if their arithmetic averages are similar. The imbalance coefficient is specified as:

$$G_t = \frac{\sqrt{\frac{1}{3}\left[ (IC_t - \bar{P}_t)^2 + (IR_t - \bar{P}_t)^2 + (SR_t - \bar{P}_t)^2 \right]}}{\bar{P}_t + \varepsilon}, \bar{P}_t = \frac{IC_t + IR_t + SR_t}{3} \quad (5)$$

where:

$G_t$ – relative structural imbalance coefficient;

$\bar{P}_t$ – average level of the three potential dimensions;

$IC_t$ – innovation capacity;

$IR_t$ – investment resources;

$SR_t$ – strategic resilience;

$\varepsilon$ – stabilizing constant.

The relative form of $Gt$ is preferable to absolute dispersion because enterprises can occupy different stages of development. The coefficient captures proportional asymmetry rather than scale alone. A growing value signals that one component is advancing faster than the others, creating a potential bottleneck.

Still, accumulated potential and realized growth are not identical categories. This distinction deserves a separate calculation. An enterprise can maintain strong capabilities while generating weak economic returns from them. The potential realization rate therefore connects the preceding-period resource configuration with current growth outcomes:

$$PRE_t = \frac{\omega_1 \Delta EVA_t + \omega_2 \Delta OCF_t + \omega_3 \Delta NPS_t + \omega_4 \Delta PROD_t + \omega_5 \Delta MS_t}{EP_{t-1} + \varepsilon} \cdot e^{-\rho T_{rec,t}} \cdot (1 - DL_t) \quad (6)$$

where:

$PRE_t$ – potential realization efficiency;

$\Delta EVA_t$ – normalized increase in economic value added;

$\Delta OCF_t$ – normalized operating cash-flow growth;

$\Delta NPSt$ – increase in the share of new products in sales;

$\Delta PROD_t$ – productivity growth;

$\Delta MS_t$ – change in the enterprise's target market position;

$\omega_1, \ldots, \omega_5$ – outcome significance coefficients;

$EP_{t-1}$ – enterprise potential accumulated in the previous period;

$T_{rec,t}$ – normalized recovery time after a disturbance;

$DL_t$ – development loss caused by interrupted or postponed projects;

$\rho$ – sensitivity coefficient for recovery duration.

Equation (6) separates resource accumulation from its productive utilization. This separation is necessary because sustainable growth depends on both processes. A high $EP_t$ combined with a low $PRE_t$ identifies unused or poorly configured potential. In contrast, persistently high realization with declining $EP_t$ can indicate excessive exploitation of existing resources and insufficient renewal. The dynamic condition of sustainable potential development can finally be expressed through a trajectory criterion:

$$SGP_t = EP_t \left(1 + \eta PRE_t\right) \left[1 - \frac{\sigma(EP_{t-h:t})}{\bar{EP}_{t-h:t} + \varepsilon}\right] \left[1 - \psi \max(0, G_t - G^*)\right] \quad (7)$$

where:

$SGP_t$ – sustainable growth potential index;

$EP_t$ – current integrated enterprise potential;

$PRE_t$ – potential realization efficiency;

$\eta$ – conversion contribution coefficient;

$\sigma(EP_{t-h:t})$ – volatility of potential over monitoring horizon $h$;

$\overline{EP}_{t-h:t}$ – average potential over that horizon;
$G_t$ – current structural imbalance;
$G^*$ – admissible imbalance threshold;
$\psi$ – penalty intensity for excessive imbalance.

This formulation changes the final diagnostic emphasis. Sustainable enterprise potential is not identified merely by a high current score. It requires sufficient capacity, productive realization, controlled volatility, and acceptable balance among innovation, investment, and resilience. A temporary expansion financed through excessive leverage would therefore receive a weaker assessment than balanced capability growth supported by stable financing.

**2. Strategic Resilience and Realization of Enterprise Potential**

Enterprise potential becomes economically relevant when accumulated resources can be converted into innovation, investment activity, and sustainable growth. The assessment therefore cannot remain limited to liquidity, asset structure, profitability, or technological expenditure. These indicators describe separate characteristics of an enterprise, but they do not explain its capacity to combine resources under changing market conditions. The proposed approach links three dimensions: innovation capacity, investment resources, and strategic resilience.

Innovation capacity reflects the ability to generate, absorb, implement, and commercialize new technological and organizational solutions. Investment resources characterize the financing space available for development without excessive deterioration of liquidity and financial stability. Strategic resilience captures the capacity to preserve development projects, redistribute resources, and recover productive activity after disturbances. Their combination forms enterprise potential for sustainable growth. The assessment system should distinguish resource availability from resource conversion. High R&D expenditure does not guarantee innovation performance, while access to capital does not ensure productive investment. For this reason, the diagnostic architecture combines input, conversion, efficiency, and risk indicators. Their applied configuration is presented in Table 3.

Table 3

**Integrated metric architecture for diagnosing enterprise potential for sustainable growth**

| No. | Diagnostic block | Applied indicator | Calculation basis | Risk correction | Analytical function |
|---|---|---|---|---|---|
| 1 | Innovation financing | Innovation investment intensity | R&D and technology investment / revenue | Financing volatility | Measures resource commitment to renewal |
| 2 | Commercialization | Innovation conversion ratio | New-product revenue / innovation expenditure | Project failure rate | Measures market conversion of innovation |
| 3 | Technology renewal | Technology renewal capacity | Renewed technology value / exposed asset base | Obsolescence rate | Identifies technological development capacity |
| 4 | Knowledge absorption | Knowledge implementation ratio | Applied external knowledge / acquired knowledge | Competency loss | Measures absorptive capability |
| 5 | Internal investment resources | Investment coverage ratio | Free cash flow / strategic investment requirement | Cash-flow-at-risk | Measures internal financing capacity |
| 6 | External financing | Capital accessibility ratio | Available external capital / financing gap | WACC and leverage | Measures financing flexibility |
| 7 | Investment productivity | Risk-adjusted investment return | Expected value creation / committed capital | Downside deviation | Measures allocation quality |
| 8 | Operational resilience | Continuity capacity | Protected output / minimum viable output | Disruption exposure | Measures operational survivability |
| 9 | Resource adaptability | Reconfiguration capacity | Reallocated resources / required reallocation | Switching time and cost | Measures adaptive flexibility |
| 10 | Recovery capacity | Growth recovery ratio | Restored value added / value lost | Recovery duration | Measures post-shock restoration |

*Source: developed by the author*

The metrics in Table 1 have different scales and economic directions. Direct aggregation would therefore distort their contribution. Fixed min-max normalization is also problematic because extreme observations change the resulting scores. An adaptive nonlinear transformation provides a more stable solution. For stimulant indicators, normalization takes the following form:

$$N_{ijt}^{+} = \left[ 1 + \exp\left( -a_{ij} \frac{X_{ijt} - B_{ij,t}}{\sqrt{\sigma_{ij,t}^2 + \tau_{ij,t}^2} + \varepsilon} \right) \right]^{-1} \quad (8)$$

where:

$N_{ijt}^{+}$ – normalized stimulant indicator;

$X_{ijt}$ – actual indicator value;

$B_{ij,t}$ – dynamic target benchmark;

$\sigma_{ij,t}$ – historical indicator volatility;

$\tau_{ij,t}$ – cross-sectional dispersion;

$a_{ij}$ – normalization sensitivity coefficient;

$\varepsilon$ – numerical stabilization parameter.

For debt pressure, recovery duration, concentration, project failure, and other destimulants, the sign inside the exponential function is reversed. This approach evaluates deviation from an economically justified benchmark rather than mechanical proximity to historical maxima. Weights should also respond to the information contained in individual indicators (Makedon et al., 2025 c). Their values can combine expert significance, statistical differentiation, and sensitivity of the final assessment:

$$w_{ij,t} = \frac{E_{ij}^{\alpha} D_{ij,t}^{\beta} S_{ij,t}^{\gamma}}{\sum_{j=1}^{m_i} E_{ij}^{\alpha} D_{ij,t}^{\beta} S_{ij,t}^{\gamma}}, \alpha + \beta + \gamma = 1 \quad (9)$$

where:

$w_{ij,t}$ – adaptive indicator weight;

$E_{ij}$ – expert assessment of economic significance;

$D_{ij,t}$ – information differentiation coefficient;

$S_{ij,t}$ – sensitivity of enterprise potential to the indicator;

$\alpha, \beta, \gamma$ – contributions of the three weighting criteria;

$m_i$ – number of indicators within component $i$.

The next stage produces separate estimates of innovation capacity $IC_t$, investment resources $IR_t$, and strategic resilience $SR_t$. A weighted arithmetic mean would permit strong indicators to conceal critical deficiencies. A multiplicative function with a bottleneck penalty reduces this problem:

$$C_{i,t} = \left( \prod_{j=1}^{m_i} N_{ij,t}^{w_{ij,t}} \right) \left[ 1 - \lambda_i \left( 1 - \min_j N_{ij,t} \right)^{\kappa_i} \right] \tag{10}$$

where:

$C_{i,t}$ – composite value of dimension $i$;

$N_{ij,t}$ – normalized diagnostic indicator;

$w_{ij,t}$ – adaptive indicator weight;

$\lambda_i$ – bottleneck penalty coefficient;

$\kappa_i$ – sensitivity to the weakest indicator.

Accordingly, $C_{1,t}=IC_t$, $C_{2,t}=IR_t$, and $C_{3,t}=SR_t$. This separation matters because similar aggregate values can conceal completely different development constraints. Their practical interpretation is specified in Table 4.

The configurations in Table 2 show why a single arithmetic score is insufficient. The integrated model must penalize structural imbalance while recognizing complementarity among the three dimensions. Innovation creates stronger development effects when financing supports commercialization and resilience protects implementation. The resulting risk-adjusted enterprise potential is calculated as:

$$EP_t^{RA} = IC_t^{\alpha_t} IR_t^{\beta_t} SR_t^{\gamma_t} \begin{bmatrix} 1 + \theta_{12} IC_t IR_t + \theta_{13} IC_t SR_t + \\ + \theta_{23} IR_t SR_t + \theta_{123} IC_t IR_t SR_t \end{bmatrix} e^{-(\mu R_t + \nu G_t)} \tag{11}$$

where:

$EP_{tRA}$ – risk-adjusted enterprise potential;

$IC_t$ – innovation capacity;

$IR_t$ – investment resources;

$SR_t$ – strategic resilience;

$\alpha_t$, $\beta_t$, $\gamma$ – component weights, whose sum equals one;

$\theta_{12}$, $\theta_{13}$, $\theta_{23}$ – pairwise synergy coefficients;

$\theta_{123}$ – three-component complementarity coefficient;

$R_t$ – aggregated enterprise risk exposure;

$G_t$ – structural imbalance coefficient;

$\mu$, $\nu$ – risk and imbalance sensitivity parameters.

Table 4

**Diagnostic configurations of enterprise potential and corresponding strategic responses**

| No. | Potential configuration | Quantitative condition | Dominant restriction | Investment response | Innovation response | Resilience response |
|---|---|---|---|---|---|---|
| 1 | Balanced expansion | All components ≥0.75 | No binding restriction | Scale efficient projects | Expand validated innovations | Maintain adaptive reserves |
| 2 | Innovation financing gap | *IC*≥0.75; *IR*<0.50 | Capital shortage | Mobilize staged financing | Prioritize commercialization | Protect project continuity |
| 3 | Capital accumulation | *IR*≥0.75; *IC*<0.50 | Weak innovation pipeline | Redirect available capital | Develop technology portfolio | Maintain financial flexibility |
| 4 | Fragile innovation growth | *IC*≥0.70; *SR*<0.50 | High disruption exposure | Finance continuity capacity | Protect priority projects | Diversify critical resources |
| 5 | Resilient technological lag | *SR*≥0.75; *IC*<0.50 | Technology deficit | Fund modernization | Increase knowledge absorption | Preserve flexibility |
| 6 | Investment overextension | *IR*<0.50; *SR*<0.50 | Liquidity pressure | Reduce marginal CAPEX | Suspend weak projects | Restore reserves |
| 7 | Commercialization bottleneck | High R&D, low conversion | Weak market realization | Finance market-ready projects | Redesign commercialization | Protect viable pipeline |
| 8 | Structural imbalance | Component dispersion ≥0.30 | Uneven capability formation | Redirect capital | Strengthen deficient component | Increase adaptability |
| 9 | Potential erosion | All components <0.50 | Systemic deterioration | Stabilize financing | Retain innovation core | Protect critical operations |

*Source: developed by the author*

Structural imbalance is calculated separately:

$$G_t = \frac{\sqrt{\left[ (IC_t - \bar{P}_t)^2 + (IR_t - \bar{P}_t)^2 + (SR_t - \bar{P}_t)^2 \right] / 3}}{\bar{P}_t + \varepsilon}, \bar{P}_t = \frac{IC_t + IR_t + SR_t}{3} \quad (12)$$

where:

$G_t$ – relative structural imbalance;

$\bar{P}_t$ – average component value;

$IC_t$ – innovation capacity;

$IR_t$ – investment resources;

$SR_t$ – strategic resilience;

$\varepsilon$ – stabilizing parameter.

A low Gt indicates coordinated development, but, more precisely, it does not automatically indicate strong potential. Three simultaneously weak components can also produce low dispersion. The level and balance of potential must therefore be evaluated jointly. At this point, the calculations form a complete diagnostic sequence. The algorithm should visually connect data preparation with the final management decision (Fig. 1).

Figure 1 should therefore appear immediately after formula (12). This position separates potential measurement from the subsequent assessment of its economic realization. Accumulated potential has limited strategic value when the enterprise fails to transform it into economic results. Realization efficiency should connect previous-period potential with current value creation, innovation output, productivity, and cash generation:

$$PRE_t = \frac{\omega_1 \Delta EVA_t + \omega_2 \Delta OCF_t + \omega_3 \Delta NPS_t + \omega_4 \Delta PROD_t}{EP_{t-1}^{RA} + \varepsilon} e^{-\rho TREC_t} (1 - DL_t) \quad (13)$$

where:

$PRE_t$ – potential realization efficiency;

$\Delta EVA_t$ – normalized growth of economic value added;

$\Delta OCF_t$ – operating cash-flow growth;

$\Delta NPS_t$ – increase in revenue share from new products;

$\Delta PROD_t$ – productivity growth;

$\omega_1, \ldots, \omega_4$ – outcome weights;

$TREC_t$ – recovery duration after disturbance;

$DL_t$ – development losses from interrupted projects;

$\rho$ – recovery-time penalty.

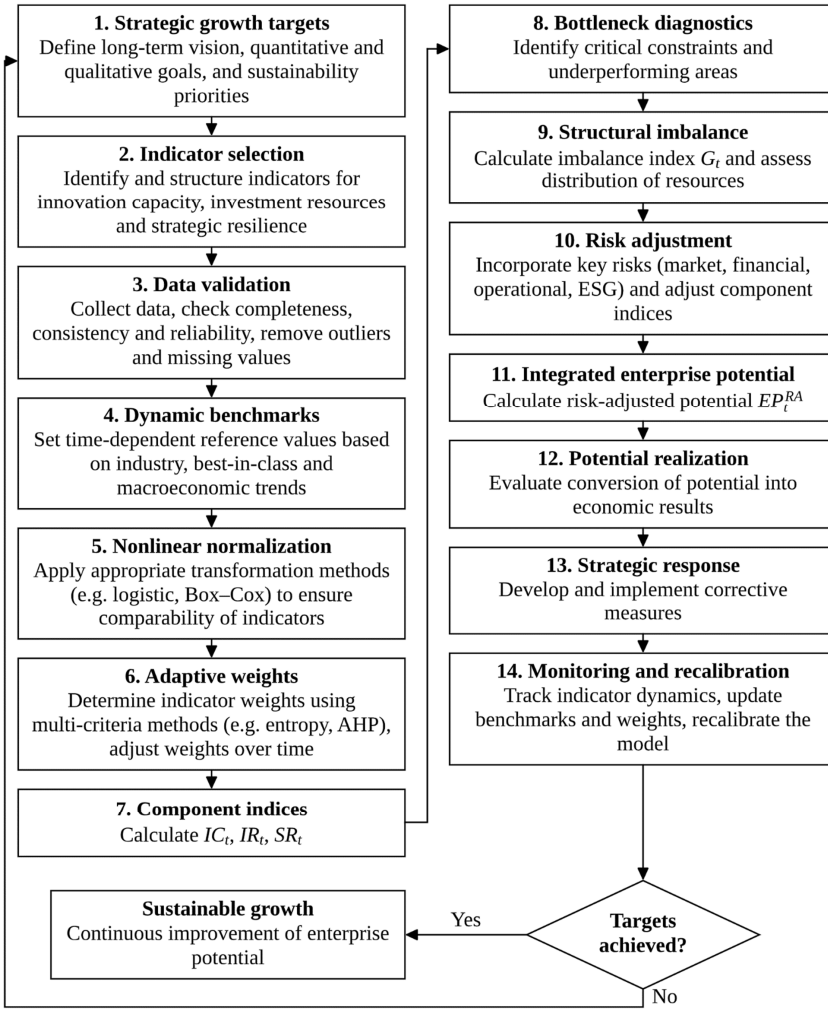



**Figure 1. Integrated algorithm for assessing enterprise potential for sustainable growth**

*Source: developed by the author*

Table 5

**Management control map for converting assessed enterprise potential into sustainable growth**

| No. | Control signal | Diagnostic combination | Economic interpretation | Immediate management action | Medium-term intervention | Monitoring metric |
|---|---|---|---|---|---|---|
| 1 | Strong conversion | High *EPRA*, high *PRE* | Potential produces measurable growth | Continue validated projects | Scale development portfolio | *EVA* and new-product revenue |
| 2 | Latent potential | High *EPRA*, low PRE | Resources remain underutilized | Diagnose conversion barriers | Redesign commercialization | *PREt* |
| 3 | Resource exhaustion | Falling *EPRA*, high *PRE* | Current growth consumes future capacity | Limit excessive exploitation | Increase renewal investment | Potential renewal rate |
| 4 | Innovation deficit | Low *IC* | Development pipeline is insufficient | Review technology portfolio | Build absorptive capability | *ICt* |
| 5 | Financing deficit | Low *IR* | Projects exceed financing capacity | Reprioritize CAPEX | Diversify capital sources | Investment coverage |
| 6 | Resilience deficit | Low *SR* | Growth remains disruption-sensitive | Protect critical processes | Increase reconfiguration capacity | SRt |
| 7 | Structural divergence | High *Gt* | Components develop asynchronously | Redirect resources | Rebalance capabilities | *Gt* |
| 8 | Recovery delay | High *TRECC* | Disturbance creates persistent losses | Activate recovery protocol | Redesign continuity system | Recovery duration |
| 9 | Systemic deterioration | Low *EPRA*, low *PRE* | Potential and conversion weaken jointly | Stabilize core operations | Rebuild development capacity | Combined trend of EPRA and PRE |

*Source: developed by the author*

The final diagnostic stage should connect potential, realization, and resilience under stress. Table 5 provides such an interpretation.

The proposed assessment architecture therefore shifts attention from the quantity of enterprise resources toward their economic configuration. Innovation capacity determines the ability to renew products, technologies, and processes. Investment resources determine the feasible scale and timing of development. Strategic resilience preserves these capabilities when operating assumptions change. Their interaction forms risk-adjusted enterprise potential, while $PRE_t$ shows how effectively that potential becomes observable economic growth (Frankowska et. al., 2025).

Enterprise potential is realized through interconnected resource flows extending from suppliers, technology providers, financial institutions, and knowledge sources to production processes and final markets. Their coordination determines how accumulated innovation capacity and investment resources become sustainable economic results. Fragmented management weakens this conversion because local optimization can improve individual operations while reducing the productivity of the enterprise system. End-to-end management, by contrast, connects resource acquisition, innovation development, investment allocation, production, commercialization, and recovery mechanisms within a single strategic trajectory.

For this reason, realization of enterprise potential should satisfy five conditions: strategic consistency of projects, sufficient innovation capacity, accessible investment resources, acceptable residual risk, and preservation of minimum resilience. These conditions transform project selection into a constrained optimization problem rather than a conventional maximization of current profit. The economic component can be formalized through a risk-adjusted portfolio objective:

$$\max_{\mathbf{x}} Z_t = \sum_{p=1}^{P} x_{p,t}\left(NPV_{p,t} + ROV_{p,t} + SCV_{p,t}\right) - \lambda\sqrt{\mathbf{x}_t^T \acute{O}_t \mathbf{x}_t} - \mu\sum_{p=1}^{P} x_{p,t} EL_{p,t} \quad (14)$$

where:

$Z_t$ – total risk-adjusted value created by the development portfolio;

$x_{p,t}$ – share of resources allocated to project $p$;

$NPV_{p,t}$ – expected net present value of project $p$;

$ROV_{p,t}$ – real-option value of managerial flexibility;

$SCV_{p,t}$ – strategic capability value generated by the project;
$\Sigma t$ – covariance matrix of project outcomes;
$EL_{p,t}$ – expected economic loss associated with project risk;
$\lambda$ – sensitivity to portfolio volatility;
$\mu$ – sensitivity to expected losses;
$P$ – number of development projects.

This objective differs from conventional profit maximization because innovation projects can create reusable technological knowledge, digital capabilities, market access, or organizational flexibility. Their strategic value can therefore exceed direct discounted cash flows. At the same time, correlated projects increase portfolio vulnerability and receive an explicit risk penalty. Investment decisions remain subject to financial and resilience constraints:

$$\sum_{p=1}^{P} x_{p,t} I_{p,t} \le IR_t^{AV}, CFaR_t^{0.95} + \sum_{p=1}^{P} x_{p,t} LQ_{p,t} \le LQ_t^{RES}, SR_{t+1}(\mathbf{x}) \ge SR^{MIN} \quad (15)$$

where:

$I_{p,t}$ – investment requirement of project pp;
$IR_t^{AV}$ – investment resources available for development;
$CFaR_t^{0.95}$ – cash-flow-at-risk at the 95% confidence level;
$LQ_{p,t}$ – additional liquidity requirement of project $p$;
$LQ_t^{RES}$ – liquidity available after maintaining operating reserves;
$SR_{t+1}$ – expected strategic resilience after portfolio implementation;
$SR^{MIN}$ – minimum admissible resilience level.

The quantitative aspect concerns the scale at which accumulated potential reaches the market. Sales growth alone gives an incomplete result because expansion can be achieved through aggressive pricing or excessive capital consumption. Market realization should therefore be related to innovation output, contribution margin, and accessible demand:

$$MRI_t = \sum_{i=1}^{n} \omega_i \left( \frac{Q_{i,t}}{D_{i,t}^A} \right) \left( \frac{CM_{i,t}}{CM_{i,t}^T} \right) \left( 1 - \rho_i^D \right) \quad (16)$$

where:

$MRI_t$ – market realization index;
$Q_{i,t}$ – realized sales of product $i$;
$D_{i,t}^A$ – economically accessible market demand;
$CM_{i,t}$ – actual contribution margin;

$CM_{i,t}$ – target contribution margin;
$\rho_i^D$ – demand-risk coefficient;
$\omega_i$ – strategic weight of product $i$;
$n$ – number of products or market offers.

The qualitative dimension concerns whether growth renews the enterprise rather than only expanding existing operations. Product quality, technological novelty, customer value, digital integration, knowledge accumulation, and scalability should therefore enter project evaluation. Here the connection with innovation capacity becomes direct: development expenditure creates sustainable potential only when new knowledge and technologies become economically usable capabilities.

Strategic resilience completes this mechanism. Projects should be evaluated against alternative scenarios involving demand contraction, financing-cost growth, supply disruption, technology failure, or delayed commercialization. The residual potential after scenario ss can be expressed as:

$$REP_{s,t} = EP_t^{RA}\left[1 - \sum_{q=1}^{Q} d_{q,s,t} v_{q,t} (1 - r_{q,t})\right] + RC_{s,t} \quad (17)$$

where:
$REP_{s,t}$ – residual enterprise potential under scenario ss;
$EP_t^{RA}$ – initial risk-adjusted enterprise potential;
$d_{q,s,t}$ – intensity of disturbance $q$;
$v_{q,t}$ – enterprise vulnerability to the disturbance;
$r_{q,t}$ – effectiveness of existing protection mechanisms;
$RC_{s,t}$ – potential restored through resource reconfiguration;
$Q$ – number of risk channels.

The realization model therefore connects innovation strategy with investment decisions and resilience requirements. Its information inputs include market demand, expected prices, customer requirements, financing conditions, technology alternatives, supplier constraints, project risks, and available competencies. These data form the analytical basis for selecting development projects and determining the sequence of their implementation (Fig. 2).

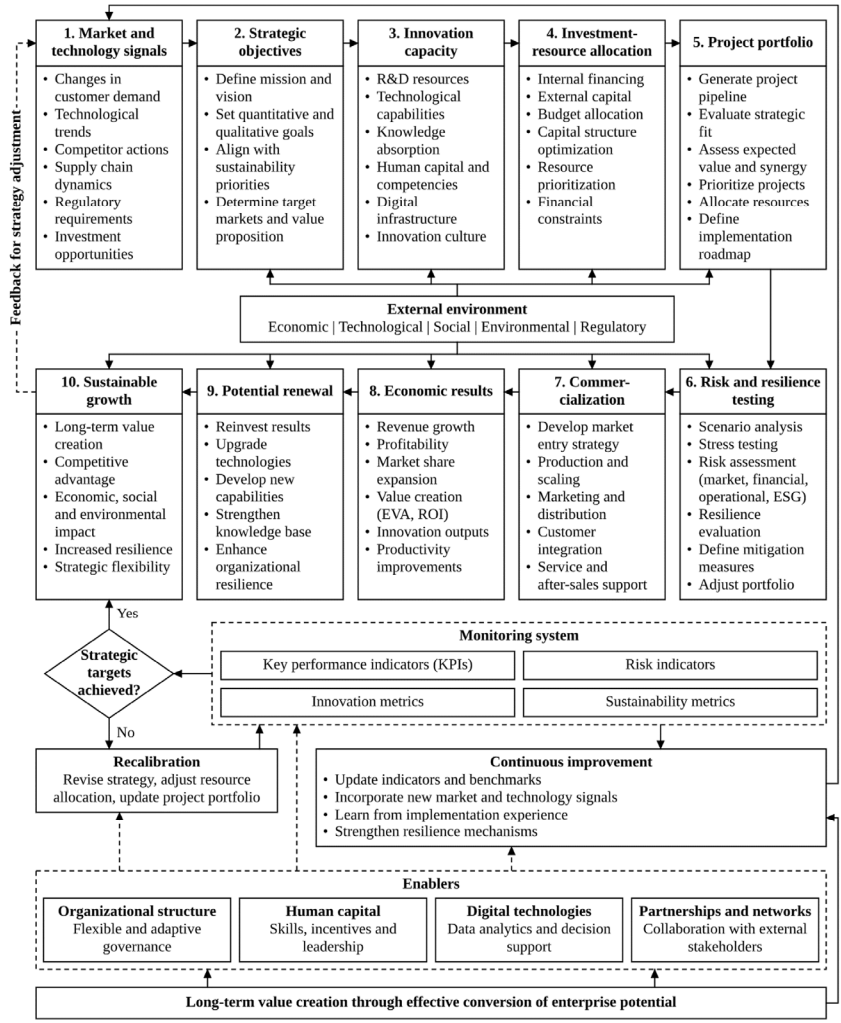



**Figure 2. Strategic model for converting enterprise potential into sustainable growth**

This architecture establishes a feedback relationship between potential formation and realization. Economic results replenish investment resources, successful innovations expand technological and knowledge capacity, while resilience mechanisms preserve development continuity. Sustainable growth therefore emerges when the enterprise continuously renews its potential while keeping investment intensity, innovation conversion, and exposure to disruption within economically justified boundaries.

## CONCLUSIONS

1. The study substantiated enterprise potential for susta inable growth as an integrated configuration of innovation capacity, investment resources, and strategic resilience rather than a static stock of available assets. The proposed structure links technological renewal, knowledge absorption, commercialization, financing capacity, investment efficiency, operational continuity, and resource reconfiguration. This approach separates resource availability from the enterprise's capacity to convert resources into economic outcomes. Sustainable growth is therefore associated with coordinated development of all three dimensions, since a deficit in one component can constrain the productive realization of otherwise strong organizational capabilities.

2. The developed assessment model provides a multistage procedure for measuring enterprise potential under heterogeneous indicators and changing operating conditions. Nonlinear normalization reduces distortions caused by extreme observations, while adaptive weighting incorporates economic significance, information differentiation, and indicator sensitivity. Multiplicative aggregation introduces a bottleneck penalty that prevents strong parameters from mechanically compensating for critical deficiencies. The integrated assessment additionally incorporates component synergies, strategic risk exposure, volatility, and structural imbalance. This construction identifies not only the current potential level but also internal disproportions capable of restricting subsequent enterprise development.

3. The proposed distinction between accumulated potential and its realization expands the analytical value of enterprise diagnostics. The potential realization efficiency indicator connects previously accumulated capabilities with changes in economic value added, operating cash flow, innovation sales, and productivity. Its joint interpretation with risk-

adjusted enterprise potential reveals fundamentally different development states. High potential accompanied by weak realization indicates unused capabilities, whereas intensive realization combined with declining potential signals resource exhaustion and insufficient renewal. The resulting diagnostic logic supports targeted allocation of investment resources instead of decisions based solely on aggregate financial performance.

4. The strategic model links potential formation, investment allocation, innovation implementation, commercialization, economic results, and subsequent capability renewal within a continuous management cycle. Project selection incorporates expected financial value, strategic capability effects, portfolio risk, liquidity constraints, and minimum resilience requirements. Scenario assessment additionally measures residual enterprise potential after demand, financing, supply, or technological disturbances. Sustainable growth is achieved when economic results replenish investment resources, successful innovations expand technological and knowledge capacity, and resilience mechanisms preserve development continuity. The model therefore provides an applied basis for recurrent monitoring, resource reconfiguration, and strategic recalibration.

**References:**

1. Duarte, N., & Dong, R. K. (2026). Industry 4.0 technologies as drivers of strategic and business model innovation: A conceptual framework. *Systems,* 14(1), 4. DOI: https://doi.org/10.3390/systems14010004

2. Eicke, A.-K., Sabel, C. A., & Nüesch, S. (2026). Strategic AI orientation and technological innovation: Evidence from managerial insights and panel data. *Journal of Product Innovation Management,* 43(2), 262–289. DOI: https://doi.org/10.1111/jpim.70001

3. European Bank for Reconstruction and Development. (2026). *Digital approach 2026–30.* Available at*:* https://www.ebrd.com/content/dam/ebrd_dxp/assets/pdfs/digitalisation/EBRD-digital-approach-2026-2030.pdf

4. Fahziar, R. I. (2026). Innovation in strategic management for sustainable business transformation. *Journal of Studies in Academic, Humanities, Research, and Innovation,* 3(1), 229–237. DOI: https://doi.org/10.71305/sahri.v3i1.1393

5. Frankowska, M., Cheba, K., Anityasari, M., & Karningsih, P. D. (2025). Digital maturity of enterprises in terms of cooperation in supply chains & networks – Intelligent management perspective. In K. Beyer, M. Łatuszyńska, K. Nermend, & M. Piwowarski (Eds.), *Intelligent management and artificial intelligence: Trends, challenges, and opportunities: Vol. 1. Proceedings on 28th European Conference on Artificial Intelligence ECAI 2025 – InMan Workshop. University of Szczecin*. DOI: https://doi.org/10.18276/978-83-8419-028-9-19

6. Garrido-Moreno, A., Martín-Rojas, R., & García-Morales, V. J. (2024). The key role of innovation and organizational resilience in improving business performance: A mixed-methods approach. *International Journal of Information Management*, 77, 102777. DOI: https://doi.org/10.1016/j.ijinfomgt.2024.102777

7. Giraldi, L., & Rossi, L. (2026). Strategic entrepreneurship in the space economy: A START framework for assessing innovative firms. *Journal of Industrial and Business Economics.* DOI: https://doi.org/10.1007/s40812-026-00389-0

8. Gkika, E. C., Kargas, A., Salmon, I., & Drosos, D. (2025). Unveiling digital maturity: Key drivers of digital transformation in the Greek business ecosystem. *Administrative Sciences,* 15(3), 96. DOI: https://doi.org/10.3390/admsci15030096

9. Gudz, O., Yevtushenko, N., & Hlushenkova, A. (2024). Directions for the development of the innovation potential of enterprises in the context of digital transformations. *Baltic Journal of Economic Studies,* 10(1), 44–53. DOI: https://doi.org/10.30525/2256-0742/2024-10-1-44-53

10. Jie, H., Gooi, L. M., & Lou, Y. (2025). Digital maturity, dynamic capabilities and innovation performance in high-tech SMEs. *International Review of Economics & Finance*, 99, 103971. DOI: https://doi.org/10.1016/j.iref.2025.103971

11. Lee, K., Song, Y., Park, M., & Yoon, B. (2024). Development of digital transformation maturity assessment model for collaborative factory involving multiple companies. *Sustainability*, 16(18), 8087. DOI: https://doi.org/10.3390/su16188087

12. Li, J., Huang, C.-K., & Wu, C.-H. (2026). Determining factors of technological innovation capability in the technology industry. *In Proceedings of the 8th International Conference on Finance, Economics, Management and IT Business* (FEMIB 2026) (pp. 48–59). SCITEPRESS. DOI: https://doi.org/10.5220/0014968500004045

13. Makedon, V., Myachin, V., Kuriacha, N., Chaika, Yu., & Koptilyi, D. (2025a). Development of strategic management of a corporation through the implementation of scenario analysis. *Scientific Bulletin of Mukachevo State University. Series "Economics"*, 12(2), 135–146. DOI: https://doi.org/10.52566/msu-econ2.2025.135

14. Makedon, V., Myachin, V., Aloshyna, T., Cherniavska, I., & Karavan, N. (2025b). Improving the readiness of enterprises to develop sustainable innovation strategies through fuzzy logic models. *Economic Studies (Ikonomicheski Izsledvania),* 34(5), 165–179. Available at: https://archive.econ-studies.iki.bas.bg/2025/2025_05/2025_05_09.pdf

15. Makedon, V., & Koptilyi, D. (2025c). Digital transformation and artificial intelligence as factors in the economic recovery of enterprises following armed conflicts. *Economics, Entrepreneurship, Management,* 12(1), 33–48. DOI: https://doi.org/10.56318/eem2025.01.033

16. Martell-Chávez, F., López-Téllez, J. M., May-Arrioja, D. A., Valenzuela-González, R., & Ortiz-Morales, M. (2026). Innovation and technology management strategies for Industry 4.0 adoption in small and medium-sized enterprises in developing countries. *Journal of Open Innovation: Technology, Market, and Complexity*, 12(2), 100769. DOI: https://doi.org/10.1016/j.joitmc.2026.100769

17. Njah, S., Danjou, C., Armellini, F., Beaudry, C., & Mosconi, E. (2026). A digital maturity model for assessing SMEs in the manufacturing sector. *Digital Engineering,* 9, 100084. DOI: https://doi.org/10.1016/j.dte.2025.100084

18. Nuryakin, & Qamari, I. N. (2026). The mediating role of innovation capability and technological capability in the relationship between absorptive capacity and SMEs' business performance. *International Journal of Innovation Studies,* 10(1), 65–79. DOI: https://doi.org/10.1016/j.ijis.2025.09.004

19. Orošnjak, M., Kedziora, S., & Desloges, M. (2025). Digital maturity of SMEs in the EU: Leaders and laggards of Luxembourg's manufacturing ecosystem. *Technologies,* 13(12), 541. DOI: https://doi.org/10.3390/technologies13120541

20. Stef, A. L., Crisan, E. L., & Vararean-Cochisa, D. (2026). Digital maturity and digital transformation maturity models: A systematic literature review. *Information Systems and e-Business Management.* DOI: https://doi.org/10.1007/s10257-026-00741-w

21. Tan, A. S. I., Sia, B. C., Yeong, W. M., & Falahat, M. (2026). Digital transformation: The role of digital maturity and its determinants on business performance. *Journal of Asia Business Studies,* 20(2), 541–564. DOI: https://doi.org/10.1108/JABS-08-2024-0480

22. Thornhill, S. (2006). Knowledge, innovation and firm performance in high- and low-technology regimes. *Journal of Business Venturing*, 21(5), 687–703. DOI: https://doi.org/10.1016/j.jbusvent.2005.06.001

23. Tsiavos, V., & Kitsios, F. C. (2026). Turning digital ambitions into digital maturity: The role of a digital transformation strategy. *IEEE Access,* 14, 40469–40477. DOI: https://doi.org/10.1109/ACCESS.2026.3673955

24. Wang, J., Cao, R., Wang, G., & Peng, X. (2024). Research on the configuration path of innovation performance of strategic emerging enterprises. *Sustainability,* 16(21), 9260. DOI: https://doi.org/10.3390/su16219260