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Digital Maturity, Management Intelligence, and Firm Productivity in Emerging Economies

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Abstract

As the world becomes more interconnected and global firms begin to enter emerging economies, digital transformation has become a crucial driver of competitiveness in these markets as organizations navigate their structural disadvantages while contending with global technological disruption. In the context of emerging markets, this paper explores the dynamics of digital maturity-firm productivity-process management intelligence. We developed a three-level conceptualization of digital maturity that embodies the extent to which digital technologies, strategic alignment, organizational culture and workforce capabilities converge across business operations. Management intelligence is the ability of firms to leverage data analytics, business intelligence systems and evidence-based decision-making frameworks for improved managerial outcomes. While existing studies suggest improvements in productivity are gained from the use of digital technologies, few have investigated empirically how management intelligence inhibits the channels through which investments in these digital services can be transformed into tangible performance results within emerging economies. Based on the Technology–Organization–Environment (TOE) framework and Resource-Based View (RBV) of the firm, this paper develops a theoretical model that relates digital maturity to firm productivity via management intelligence capabilities. A quantitative research method was used with survey data collected from 350 medium and large enterprises in selected emerging economies. The hypothesized relationships were tested using Structural Equation Modeling (SEM).

The results show that digital maturity improves management intelligence capabilities, which positively influence firm productivity. Furthermore, the results reveal that management intelligence serves as a partial mediator in the relationship between digital maturity and productivity; this implies that the adoption of technology alone does not drive productivity without accompanying managerial capabilities. These relationships are further reinforced by environmental factors like regulatory backing and competition intensity. By using empirical data from emerging economies, this study adds to the literature and underscores the strategic significance of aligning digital infrastructures with intelligent managerial systems. These findings provide actionable insights for business leaders and policymakers working to accelerate digital transformation and productivity enhancement under resource constrained developing economic contexts.

Keywords

Digital maturity, management intelligence, firm productivity, emerging economies, digital transformation, organizational performance

INTRODUCTION

Fast changing digital technologies (cloud computing, artificial intelligence, big data analytics, Internet of things IoT and automation systems among others) have brought about paradigm shift in the global business environment. These technologies have radically changed the way companies function, compete, and generate value. For developed economies, digital technologies have already taken root, whereas firms in the emerging east are navigating an increasingly complex landscape defined by infrastructural bottlenecks, regulatory ambiguity, financial limitations and a lack of human capital. However, the digital transformation offers incredible opportunities for them to boost productivity and expand their competition even in these challenging markets.

Emerging economies are a very large part of global growth. For instance India, Brazil, South Africa, Indonesia and more countries are getting industrialized with integrated in a much larger global value chains. Nonetheless, productivity gaps across emerging and developed economies are still considerable. Improving firm level productivity is, therefore, a necessary part in sustainable economic development, income growth and international

competitiveness. The emergence of digital maturity and management intelligence as the strategic imperative for organizations to close performance gaps.

The digital maturity model involves much more than simply adopting technology. It reflects an organization's overall ability to weave digital technologies into the fabric of its core operations, strategy, culture and workforce skills. An organization that strives for this level of digital maturity will not just put in place software-organisation solutions but undertake a purposeful approach to its long-term strategic goals, be innovative and work on developing the soft skills of its employees to make the most out of the digital tools at their disposal. Digital maturity therefore includes technology infrastructure, digital governance, organizational readiness and leadership commitment. High digital maturity firms demonstrate higher agility, shorter innovation cycles and operational efficiencies.

But digital technologies in themselves do not alter the productivity spectrum. Hardware and software investments can fritter away unused if organizations do not have the managerial ability to understand and deploy data. This is when management intelligence really comes into play. Management intelligence is another related term that describes the systematic implementation of data analytics, business intelligence application software, performance dashboards, predictive modeling and decision-support systems to improve managerial decision-making. It applies technological systems to human cognition and strategic reasoning. Management intelligence is crucial to gather relevant information from raw data, allowing companies to improve internal processes by using resources efficiently and adapting quickly when market fluctuations occur.

Digital maturity and management intelligence are intrinsically complementary. Digital maturity gives the technological basis—data collection systems, digital workflows, integrated platforms; management intelligence converts them into genuine strategic value. In new economy where there is much more volatility in the market & uncertainty from institutions, intelligent management systems can become a game-changer for reducing risks and improving adaptability. Companies that can harness digital data for making informed decisions are at the forefront of innovation and operational efficiency — they have a greater capacity to innovate, eliminate waste or streamline operations to improve output per unit of input.

While scholarly interest in digital transformation is high but there are still several research gaps. First, a large portion of existing literature is biased towards developed economies, leading to limited generalizability in emerging contexts. Second, previous research often focuses on this direct connection between digital adoption and performance while neglecting to examine the mediating mechanisms that facilitate productivity by technology. Third, few studies unify the two into an explanatory framework. Addressing these gaps is essential for the progress of both theory and practice.

The present research builds on two interrelated theoretical lenses. Adoption of technology outcomes are determined by technological readiness, organizational characteristics and environmental context according to the Technology–Organization–Environment (TOE) framework. This framework precisely applies to developing countries, which are heavily influenced by external factors like regulatory policies, availability of infrastructure quality and intensity of competition that have a strong hand at determining the outcomes for digital transformation. Conversely, the Resource-Based View (RBV) asserts that sustainable competitive advantage is derived from resources and capabilities that are valuable, rare, inimitable, and non-substitutable. Digital maturity and management intelligence can thus be viewed as strategic capabilities that drive outperforming from this perspective.

Drawing on perspectives of TOE and RBV, this study establishes the fact that digital maturity is an enabler for management intelligence capabilities, resulting in improved productivity at firm level. Additionally, these relationships may be moderated by environmental factors such as regulatory support, technological infrastructure availability, and market competition. This integrated approach will offer the foundations for understanding how digital transformation can materialize and support performance in emerging economic contexts.

Thus, the aim of this study is threefold. On the one hand, this would try to explore how digital maturity affects management intelligence in firms located within emerging economies. Second, it examines how management intelligence affects enterprise productivity. It further examines the mediating role of management intelligence and moderating influence of environmental factors in this relationship.

Grasping these dynamics has significant, practical significance. For managers, the findings underscore that managerial capability and analytics training need to accompany investments in digital technologies. For policymakers, the implications of the results suggest the need to aim at supportive digital ecosystems — developing infrastructure, promoting regulatory clarity and providing incentives for technology adoption. This research provides an empirical study focused on emerging markets and therefore, adds to the growing body of knowledge in the area of digital transformation for scholars.

In conclusion, digital maturing and management intelligence are interlinked capabilities paving the way for transformative developments in firms in developing economies. Within this context, the present study investigates: (1) theoretical contributions in reactive and proactive absorption as hold mediating roles reflecting process-oriented behaviors; and (2), how absorptive capacity can also be utilized to sustain productivity coupled with resilience, generating insights for organizations shifting towards digital domains.

LITERATURE REVIEW

The increasing importance of digital technologies for determining organizational competitiveness has become an active field of academic inquiry in management, economics and information systems. The importance of digital maturity and management intelligence as a means to improve firm productivity is growing in emerging economies. Though prior studies have examined the constructs of digital transformation and performance outcomes, relatively few attempts have adopted an integrated framework to examine these constructs as a cohesive unit across one another (both in terms of business domain and time) – especially within developing market contexts. In this chapter, the existing literature that focusses on digital maturity and management intelligence is reviewed and how it relates to firm productivity is analyzed.

A. Digital Maturity and Firm Productivity

Digital maturity is the degree to which organizations use digital technologies strategically in their processes, culture and business models. And it moves beyond basic technology adoption and is a reflection of firm‘s ability to use digital initiatives not just ad hoc but in line with the long-term strategic objectives. Researchers view digital maturity as a multidimensional measure that includes technological infrastructure, digital leadership, workforce competencies, organizational culture and innovation orientation. Such companies with high digital maturity show best practices in adopting enterprise systems, cloud platforms, big data analytics, and automation tools across various functions such as operations, marketing, finance, and supply chain management.

In academic literature the link between digital maturity and firm productivity has received extensive coverage. Operational efficiency is enhanced with digital technology through streamlined processes and efficient resource distribution. Automation systems increase the speed and consistency of production, while analytics tools allow firms to pinpoint inefficiencies and potential cost savings. In addition, using digital platforms improves coordination across departments and partners of the supply chain, which will heighten the overall organization responsiveness.

In emerging economies, digital maturity matters in particular because of structural inefficiencies and limitations on resources. By leveraging technology-driven solutions, firms that adopt and integrate digital systems can maximize their potential despite infrastructure and workforce skill limitations. But studies show that increased digital maturity doesn’t necessarily lead to productivity gains. The success of digital investment is reliant on complementary firm capabilities—managerial expertise and experience, process re-engineering, and cultural change. Thus, while digital maturity lays the technological foundation for productivity improvement, its returns are often dependent on a firm’s strategic use of digital resources.

B. Management Intelligence and Its Mediating Role in Productivity

Management intelligence is the ability of firms to convert data into actions that inform strategic and operational decisions. Includes business intelligence systems, online analytical processing (OLAP), performance dashboards, predictive modeling and evidence-based management. Despite the growing importance of data-driven decision making in many organizations today as a means towards maintaining competitive advantage in tumultuous and uncertain business environments, Management intelligence merges technology, providing the organization with a response to the market.

The literature points out that management intelligence acts as an important nexus between technology adoption and performance. If digital maturity ensures data availability and systems integration, then management intelligence is responsible for extracting results from available data. Firms that invest in analytics training, decision-support systems, and performance monitoring tools are much more likely to see measurable productivity gains. Analysis-based For instance, managers can improve production schedules, efficiency in inventory, enhancement of customer targeting, and restructuring of costs on an analytics foundation.

In emerging economies, the effect of management intelligence as a mediating variable can be stronger. Agile decision-making is also needed due to market volatility, regulatory uncertainty, and competitive pressures. As a result, companies with robust management intelligence capabilities are more likely to risk manage, forecast demand curves and allocate resources accordingly. Empirical studies found that firms that combine digital infrastructure with analytical leadership outperform those organizations that rely only on investments in technology. Management intelligence is thus a strategic competency that translates digital maturity into productivity benefits, giving it vital importance in any digital transformation program.

RESEARCH METHODOLOGY

This chapter outlines the methodological framework adopted to examine the relationships among digital maturity, management intelligence, and firm productivity in emerging economies. The study employs a quantitative research design to test the proposed hypotheses and validate the conceptual framework developed in earlier chapters. A structured and systematic approach was implemented to ensure reliability, validity, and generalizability of the findings.

A. Research Design and Data Collection

Therefore, this study utilizes a cross-sectional, quantitative research design through survey methodology to collect empirical data from firms located within EMs. A quantitative approach is applied because the purpose of this research is hypothesis testing that is theoretically grounded and involves assessing causal relationships among more than two constructs. This cross-sectional data collection provides information about specific organizational practices and performance measures at a single point in time, so the current level of both digital maturity and intelligence management.

The target participants were medium and large managers in selected emerging economies, including India, Brazil and South Africa. The chosen countries are classified as Emerging from their high growth potential, increased digital transformation and varied industrial backdrop. Firms were drawn from manufacturing, services, information tech, and retail sectors to maximize generalizability across businesses. A stratified sampling method was used to ensure representation across sectors and firm size.

Data were collected by the way of a structured questionnaire electronically distributed to senior executives, chief information officers (CIOs), operations managers and strategy heads. Respondents were chosen based on their direct participation in digital transformation initiatives and performance management. The survey was conducted over six months period. Of the 450 questionnaires distributed, 350 valid responses were retained after removing incomplete or inconsistent entries, yielding a response rate of 77%.

Multiple procedural remedies were employed to reduce common method bias. To minimise social desirability bias, the respondents were assured of anonymity and confidentiality. Items of the questionnaire were logically arranged and reverse-coded when appropriate. Before the full survey, we next conducted a pilot study with 25 managers to validate wording and clarity as well as test the reliability of measurement scales. Minor adjustments for better compatibility/providing context were made as a result of pilot test feedback.

Ethical considerations were carefully considered during the entire research process. Participation was entirely voluntary, participants provided written informed consent, and the data were utilized only for academic purposes. These safeguards protected against research misconduct and promoted research transparency.

B. Measurement Instruments and Data Analysis Techniques

The constructs of interest in this study—digital maturity, management intelligence, firm productivity, and environmental factors—were measured using validated multi-item scales adapted from literature. Items were rated on a seven-point Likert scale from 1 (“strongly disagree”) to 7 (“strongly agree”), which allowed respondents to express varying degrees of agreement.

We operationalized digital maturity as a multidimensional construct which includes technological integration, alignment between the digital and corporate strategy, employee skills on digital technologies and innovation orientation. Indicators for management intelligence (capability in analytics, usage of decision-support systems, real-time performance monitoring and data-driven culture) were used. Firm productivity was measured in perceptual performance metrics (e.g., operating efficiency, output growth, cost reduction) and also relative to industry competitors. With this framework, we categorized several environmental factors, such as support for regulations, availability of technological infrastructure and intensity of competition.

Lesson summary statistical tests for ensuring reliability and valid measurement Cronbach’s alpha and composite reliability coefficients were used to assess internal consistency reliability, with values greater than the recommended threshold value of 0.70. Convergent validity was measured by Average Variance Extracted (AVE), ensuring AVE values above the threshold of 0.50. The discriminant validity was established through the Fornell-Larcker criterion and cross-loading analysis, wherein it appeared that each construct was different from other constructs.

Structural Equation Modeling (SEM) was adopted for hypothesis testing by using SmartPLS software. SEM is particularly appropriate for analyzing complex relationships which include mediation and moderation effects. The analysis proceeded in two steps, first investigating the measurement model, and second examining the structural model. Path coefficients, t-statistics, and p-values were analyzed for testing hypothesized relationships. Bootstrap with 5,000 resamples was used to ensure estimates were robust.

Also, mediation analysis was performed to investigate basic hypotheses on whether management intelligence is an intermediary channel between digital maturity and company productivity. Moderation analysis was used to study if the environmental factors influenced the relation between digital maturity and management intelligence. Goodness-of-fit indices and explanatory power (R^2 values) were assessed to calculate the overall strength of the model.

By employing such rigorous analytical methods, the study achieves empirical rigour and offers significant evidence on the relationship between digital maturity, management intelligence and productivity outcomes of firms in emerging economies.

RESULTS AND ANALYSIS

The purpose of the chapter is to present the empirical results that study the relationships between digital age, management intelligence, and firm productivity in emerging economies. The analysis follows a two-step Structural Equation Modeling (SEM) approach by first assessing the measurement model followed by testing the structural model and hypothesis.

A. Measurement Model Assessment

The measurement scales were assessed for reliability and validity before testing the hypotheses. Cronbach's alpha and Composite Reliability (CR) were used to assess internal consistency reliability. The threshold with respect to 0.70 was superior for all constructs representing a suitable degree of reliability. Cronbach's alpha for digital maturity, management intelligence, firm productivity and environmental factors was 0.91, 0.89, 0.87 and 0.85 respectively.

AVE was computed to assess convergent validity. AVE (average variance extracted) was greater than the recommended threshold of 0.50 for all constructs, which means that distributions explained more than half of the variance in their respective indicators. The Fornell–Larcker criterion confirmed discriminant validity, with the square root of each construct's AVE higher than its correlations with others constructs. Cross-Loading analysis also demonstrated discriminant validity.

Multicollinearity diagnostics indicated no serious collinearity problems, as VIF values of all the independent variables remained below 3.0. These results validate that the measurement model is statistically appropriate and valid for structural model assessment.

B. Structural Model and Hypothesis Testing

After establishing the validity of measurements, a structural model was assessed using bootstrapping with 5,000 resamples. Path coefficients (β), t-values, and significance levels were analysed to test the proposed hypotheses.

The relationship between digital maturity and management intelligence was large, positive and significant ($\beta = 0.68$, $p < 0.001$), which supports Hypothesis 1. This implies that firms with greater digital integration, strategic alignment, and workforce competence will have a greater capability of developing strong analytics and decision-support systems.

Management intelligence exhibited a substantive positive impact on firm productivity ($\beta = 0.74$, $p < 0.001$), providing support for Hypothesis 2. It means that companies leverage advanced analytics, real time monitoring systems and data-driven decision-making best practices outperform organizations in terms of operational efficiency and output performance.

The direct impact of digital maturity on firm productivity was positive but weaker ($\beta = 0.29$, $p < 0.01$) than the indirect effect resulting from management intelligence. The results of the mediation analysis confirmed that there is a partial mediation effect, suggesting management intelligence partially mediates the effect of digital maturity on productivity (indirect effect $\beta = 0.50$; $p < 0.001$), thus supporting Hypothesis 3. This finding suggests that digital technologies are not enough on their own; the productivity impact of such technologies is largely contingent on managerial ability to convert diverse information into action.

Hypothesis 4 was supported because environmental factors moderated the relationship between digital maturity and management intelligence ($\beta = 0.25$, $p = 0.042$). The impact of digital maturity on management intelligence strengthens in contexts that are marked by robust regulatory support, competitive intensity and technological infrastructure. This further emphasises the role of external institutional environments as shaping factors that affect digital transformation outcomes in emerging economies.

Digital maturity and environmental factors explained 46% of variance in management intelligence (β: $R^2 = 0.46$); The R^2 for the firm productivity model was 0.62, indicating significant explanatory power. Such values imply a good predictive power of the model.

Table 1: Structural Model Results

Hypothesis	Relationship	Path Coefficient (β)	t-value	p-value	Result
H1	Digital Maturity → Management Intelligence	0.68	14.52	<0.001	Supported
H2	Management Intelligence → Firm Productivity	0.74	16.37	<0.001	Supported
H3	Digital Maturity → Firm Productivity (Direct Effect)	0.29	3.11	0.002	Supported
H3 (Indirect)	Digital Maturity → Management Intelligence → Productivity	0.50	12.04	<0.001	Supported
H4	Environmental Factors × Digital Maturity → Management Intelligence	0.25	2.04	0.042	Supported

Model Fit Indicators:
R^2 (Management Intelligence) = 0.46
R^2 (Firm Productivity) = 0.62
All VIF values < 3.0

C. Interpretation of Findings

These findings lend robust empirical support to the theoretical framework linking the constructs of digitization maturity, managerial astuteness, and organizational efficacy. The gap from digital maturity to management intelligence signals the critical importance of embedding good analytic infrastructure and strategic alignment-management quality in effective analytics. Businesses that integrate digital tools across operations are creating richer datasets that drive improved intelligence systems.

Management intelligence had a strong impact on productivity, highlighting the notion that data-driven managerial practices are key drivers of operational efficiency. This insight supports the Resource-Based View, which highlights that capabilities — not simply resources — produce a sustainable competitive advantage. Firms leverage digital technologies only when they construct the organizational competence to utilize them.

The partial mediation results show that while digital maturity does yield some direct productivity benefits (e.g. automation, process optimization) much of the impact is mediated by management intelligence. This is consistent with more recent studies, emphasizing the role of complementary assets in digital transformation efforts.

The moderation effects of environmental factors indicate that the right context of regulatory and competition supports companies to harness more benefits of their digital transformation. With the advancement of digital infrastructure and government incentives, along with firms benefiting from more competitive markets, emerging economies can present good opportunities for firms to reap profits on their investments in digitization.

D. Summary of Results

These findings supported the notion that digital maturity is an instigator of management intelligence which, in turn, positively impact firm productivity. Firstly, through management intelligence, technological capability is the most significant driver of measurable performance. Furthermore, environmental factors further reinforce the connection between digital maturity and managerial intelligences capabilities.

These findings add to the limited empirical evidence from developing economies and underscore the necessity to consider both technological and managerial facets of digital transformation efforts. We elaborate on the theoretical and managerial implications of these findings in the following chapter.

IMPLICATIONS AND STRATEGIC INSIGHTS

This chapter interprets the empirical findings of the study and situates them within broader theoretical and practical contexts. The results demonstrate that digital maturity significantly enhances management intelligence capabilities, which in turn drive firm productivity in emerging economies. Moreover, environmental conditions strengthen these relationships. Building upon these findings, this chapter elaborates on the theoretical contributions, managerial implications, and policy-level insights derived from the research.

A. Theoretical Contributions to Digital Transformation Research

The results of this study add to the growing literature about digital transformation, especially in emerging economic contexts. While previous studies have mainly focused on the direct effect of adopting digital technology and firm performance, this research contributes to theory by specifically uncovering management intelligence as a mediating mechanism. This clarification fills an important gap in the literature: why some firms gain significant productivity increases from digital investments but others do not.

Digital maturity is valuable organizational resource from the Resource-Based View (RBV) perspective. Nonetheless, RBV also recognises that having resources is not enough to create competitive advantage; it is about the ability to deploy and exploit those resources in a manner that generates sustainable performance. And indeed the empirical evidence to date supports this in spades as management intelligence begins to emerge as an important strategic capability which drives the conversion of digital infrastructure. into visible productivity gains

Furthermore, the research strengthens TOE (Technology–Organization–Environment) framework. The moderating nature of environmental factors indicates that the impact of technological adoption is mediated by contextual elements, including regulatory support, infrastructural availability, and competitive intensity. It implies that digital transformation is not a mere internal organizational process but contextualized in the larger institutional environments.

Another theoretical contribution is the contextualization of digital maturity in emerging economies. A large part of the digital transformation literature is based on studies conducted in developed-country settings. This study therefore extends prior empirical research on the importance of integrated digital capabilities and intelligence based management systems by demonstrating their equally important role in less mature economic environments, focusing specifically on firms operating in developing markets. Consequently, the results broadened the applicability of digital transformation theories beyond developed economies.

B. Managerial Implications for Organizational Leadership

The empirical findings present five critical implications for managers and organizational leaders aiming to improve productivity through digital transformation efforts. Companies need to understand that digital maturity isn't just about implementing the latest technology. Strategic alignment and cultural adjustment must supplement investments in enterprise systems, analytics platforms or automation tools. Firms that do not integrate digital initiatives within their core business strategies risk underutilizing their technological resources.

Second, the significant mediating role of management intelligence highlights the need for developing data-fueled managerial capabilities. Data functional silos should be broken down immediately, and investments in analytics training programs, leadership development for digital decision-making and data integration efforts must receive prioritized attention. Establishing data frames around centralized business intelligence units or analytics teams to help filter this information for the whole organization. Moreover, embedding performance dashboards and real-time monitoring systems into everyday operations allows managers to respond proactively to emerging issues.

Third, firms in emerging markets should have adaptative leadership practices. Market volatility and regulatory uncertainty are usually higher in developing markets therefore quick decisions matter more. Management intelligence systems thus enable firms to experience foresight which can help them in predicting demand-imbalance, minimizing supply chain disruptions and also managing potential financial vulnerabilities.

Another key takeaway for management is that cross-department collaboration will be required. True digital maturity often demands integration across information technology, operations, marketing and finance functions. Disruption of organization silos improves the path for information flow and advances management intelligence functionality. Hence leaders must build collaborative cultures in which data is shared and the differences help co-create solutions.

Finally, managers must assess digital transformation initiatives based not just on tech specs but also performance outcomes. As with any digital investment, however, clear productivity benchmarks—whether cost reductions, output improvements or efficiency gains—need to be set to determine return on investment. This recurrent performance assessment guarantees you remain responsible for your actions while simultaneously optimizing the return on investment of your digital transformation.

C. Policy and Strategic Implications for Emerging Economies

Apart from organizational-level ramifications, this study identifies salient policy-related implications for governmental and institutional stakeholders of emergent economies. The fact that environmental factors play a substantially moderating role suggests that enabling circumstances can enhance the effect of digital maturity. Thus, policymakers have a key role to play towards creating digital ecosystems that firms can thrive in. For starters, investment in digital infrastructure is foundational. It is the reliable broadband connectivity, the cloud infrastructure and cybersecurity frameworks, that underpin a technological foundation for firms to scale digital maturity. Even technologically ambitious firms can find it difficult to implement advanced digital systems without the support of robust infrastructure.

Second, regulation as well as supportive policies are conducive to digital adoption. To ease the financial burden on firms, notably SMEs, governments can offer tax incentives, digital transformation grants and innovation funding programs. Having simple regulatory processes around such digital technologies also decreases uncertainty

and thus encourages investment. Third, education and workforce development efforts are critical. By equipping employees with digital skills, organizations prepare themselves for transformation. Industry partnerships around digital education, vocational training and analytics certification programs can also help improve national competitiveness.

Moreover, competitive markets encourage innovation and efficiency. The competitive intensity incentivizes organizations to embrace digital technologies for market relevance. Policymakers should thus encourage fair competition and lower entry barriers that hinder innovation.

At a macroeconomic level, firm productivity feeds into national growth and global competitiveness. Digital maturation and management intelligence may fuel the engines of industrial modernization, export growth, and integration into global value chains. Governments can boost the benefits of digital transformation in sectors by creating supportive institutional arrangements.

The results reveal that digital maturity and management intelligence are not stand-alone organizational phenomena rather parts of an extensive socio-economic ecosystem. To reap the full productivity gains from digital transformation, integrated action between firms and policymakers is needed in emerging economies.

ENVIRONMENTAL IMPACT OF DIGITAL MATURITY AND MANAGEMENT INTELLIGENCE

Digital transformation is measured in economic or productivity terms mainly though its environmental impact is just as significant and it can be applied to emerging economies that need to balance growth with sustainability. We posit that the management intelligence acquired as companies become digitally mature will drive high concentrations of environmental benefits through improvements in resource utilization, waste and energy reductions, and sustainability decision-making. In essence, building a business on such scalable solutions can lead companies towards growth but the nature of digital expansion is also intertwined with environmental challenges to reconcile.

A. The positive impacts of digital maturity on the environment

Organizations with a developed level of digital maturity are able to deploy advanced monitoring systems, automation technologies and data analytics platforms that directly and positively contribute to operational efficiency. Firms use real-time data collection and performance dashboards to improve monitoring of energy use, use of raw materials, emissions, etc. These insights enable managers to detect inefficiencies and take corrective action that shrinks the environmental footprint.

Digitally enabled supply chain systems, for example, optimize transportation routes that reduce fuel consumption and greenhouse gas emission. And smart manufacturing technologies such as Internet of Things (IoT)-enabled sensors and automated production lines cut down on material waste while increasing precision in the production process. Analytics-driven predictive maintenance systems can help avoid equipment breakdowns, prolong machine service life and prevent the use of obsolete resources. In emerging economies, where the manufacturing sector can be resource-heavy, these gains can translate to a big environmental impact.

In addition to that, digital platforms promote a circular economy. But a data-empowered understanding of what materials and products are being used allows companies to increase recycling rates, minimize unnecessary packaging waste, or source sustainably. The reliance on paper achievement can undoubtedly decrease with the adoption of digital documentation and cloud jurisdictions.

Management intelligence is critical for amplifying these environmental benefits. Building environmental performance indicators into the decision-making systems would help firms integrate its productivity goals with sustainability imperatives. By providing data-driven insights, managers can share the facility's cost efficiency alongside reports of environmental impact so that productivity increases do not come at the price of ecological devastation.

B. Environmental Problems Linked to Digital Growth

While digital transformation has its benefits, it also raises environmental issues. The growth of digital infrastructure comes at a larger energy cost, especially in data centers, cloud computing buildings and telecoms networks. In several emerging economies, energy generation is still primarily based on fossil fuels, heightening the carbon emissions appurtenant to digital technologies.

The creation and disposal of electronic equipment entails environmental hazards, as well. The rapid growth of servers, computers, sensors and networking devices is the main culprit behind this increase e-waste which can be dangerous if not handled properly. E-waste recycling systems in emerging economies tend to be ineffective, resulting in environmental contamination and public health threats.

The current economy sustains the things we turn to in sensitive stages, never-ending material development, while rapid technological stagnation commands new equipment updates. The Digital Maturity model lacks consideration of environmental impact, leaving a gap in procurement policies and whether recycling initiatives are implemented.

Management intelligence can help mitigate some of these risks through environmental cost assessments that feed into strategic planning. For example, analytics can help to assess the carbon impact of digital operations and potential for switching to renewable energy. Firms can target balanced growth strategies when evaluating both environmental performance and financial metrics.

C. Digital Intelligence, One of the Drivers for Sustainable Development

The area where digital maturity and environmental sustainability intersects is closely related to the United Nations sustainable development goals. In developing countries, economic growth usually brings environmental pressure such as pollution, deforestation and depletion of natural resources. Digital transformation provides a chance to untangle environmental damage from productivity gains. Sustainable production practices are also facilitated by data-driven decision making which allows for accurate measurement of environmental indicators like carbon emissions, water usage and waste produced. Companies that embed environmental data in management intelligence systems can establish measurable sustainability goals and track progress on an ongoing basis.

Another aspect less noticed and more important from this last decades is that digital platforms foster transparency and responsibility. Analytics approach to environmental reporting systems improves stakeholder confidence and helps stay in compliance with environmental regulations. Too, the use of digital technologies by governments to monitor industrial emissions and enforce standards can help.

On a macroeconomic level, green innovation is enabled by digital maturity. Producers investing in smart technologies are more likely to produce environmental products and services (e.g., energy-efficient appliances or low-carbon supply-chain solutions). This innovation advances the shift to sustainable industrialization in emerging economies. Building the next-generations digital responsibly cannot be a solitary endeavor. A business must implement green IT, such as energy-efficient systems, renewable energies and responsible e-waste disposal. Policymakers can encourage the development of sustainable digital infrastructure and backing research on energy-efficient technologies.

Overall, digital maturity and management intelligence are both opportunities and challenges for environment sustainability in the emerging economies. When aligned with sustainability objectives, digital transformation has the potential to radically reduce environmental impact while improving productivity. Without adequate governance and sustainability measures, though, digital expansion poses risks in higher energy usage and electronic waste. Hence it becomes indispensable to have environmental elements into the digital strategies for productive and sustainable economic growth in long-run.

CONCLUSION

This research endeavored to investigate the interactions between digital maturity, management intelligence and productivity in firms located in emerging economies. With global markets being more and more digital, firms localized in developing areas have a chance to take advantage of the technology available, but they face structural challenges as well. The results of this study furnish abundant empirical evidence that digital maturity drives firm productivity, mostly mediated by management intelligence.

To begin with, this study validates that digital maturity constitutes a core capability for organizations as it empowers them to adopt advanced technologies as well as align their digital strategies with corporate objectives to drive a culture of innovation within the organization. But digital investments in themselves don't directly lead to productivity growth. Results show that management intelligence, conceptualized as organizations' ability to transform data into information used for their decision-making processes, acts as a crucial mechanism linking organizational digital maturity with quantifiable performance effects.

Second, the strong mediating role of management intelligence reflects attention to complementary organizational capabilities. Companies that align technological frameworks with data-led leadership strategies far more effectively allocate resources, enhance working processes and boost strategic agility. This aspect underlines the claims of Resource-Based View (RBV), which state that competitive advantage comes not only from technological resources, but also from the ability to utilize them.

Third, the study emphasizes the moderating role of environmental factors such as regulatory support, technological infrastructure and competitive intensity. "Supportive institutional environments enhance the positive impact of digital maturity on management intelligence," asserts the study. This highlights the significance of

government policies, digital infrastructure development, and market dynamics in determining the success of digital transformation initiatives in developing economies.

The implication of this study was that success in digital transformation comes from a comprehensive approach. Organizations need to take a step beyond acquiring more technology, and invest in analytics training programs, leadership development, and cross-functional collaboration. Further, embedded performance dashboards, predictive analytics and real-time monitoring systems enhanced organizational agility and also boosted productivity outcomes. Governments in emerging economies are expected to be a key enabler of digital transformation, from a policy perspective. Any investment in broadband infrastructure, an innovation incentive structure, regulatory predictability and digital skills for the workforce create enablement ecosystems where firms can achieve digital maturity. Policymakers can spur firm-level productivity while supporting broader economic development by cultivating package of supportive digital dimensions.

Moreover, the findings of this study demonstrate that digital maturity can drive resource-saving when supportive of sustainability strategies by addressing environmental externalities and transforming electricity systems through energy efficiency measures (ElShafie et al., 2022) and green innovation (Hansen et al., 2014). But digital growth needs to be managed responsibly so that concerns around energy consumption and electronic waste are addressed. Management intelligence systems that incorporate sustainability metrics enable balanced and responsible growth.

This study has some limitations, despite its contributions. The cross-sectional study design limits the long-term causal inference. Longitudinal approaches to investigate the iterative nature of digital maturity and productivity outcomes could be adopted in future studies. Also analyses by industry could show varies outcomes in digital transformation impacts. This generalizability would be spirited further with the inclusion of more emerging economies in future research.

Overall, we show that digital maturity and management intelligence are both complementary capabilities to increase firm productivity in emerging economies. Digital transformation is not just a technology change; it is an organizational strategy journey that needs smart leadership and supportive institutional environments. Businesses in emerging economies can unlock productivity, competitiveness, and sustainability with a hybrid of digital systems for analytical decision-making.

REFERENCES

[1] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120.
[2] Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy. *MIS Quarterly, 37*(2), 471–482.
[3] Brynjolfsson, E., & McAfee, A. (2014). *The second machine age*. W. W. Norton.
[4] Brynjolfsson, E., Rock, D., & Syverson, C. (2017). Artificial intelligence and the modern productivity paradox. *NBER Working Paper*.
[5] Chen, D. Q., Preston, D. S., & Swink, M. (2015). How the use of big data analytics affects firm performance. *Journal of Management Information Systems, 32*(4), 4–39.
[6] Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity. *Administrative Science Quarterly, 35*(1), 128–152.
[7] Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities. *Strategic Management Journal, 21*(10–11), 1105–1121.
[8] El Sawy, O. A., Kræmmergaard, P., Amsinck, H., & Vinther, A. L. (2016). How LEGO built the foundations for digital leadership. *MIS Quarterly Executive, 15*(2), 141–166.
[9] Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for digital transformation strategy. *MIS Quarterly Executive, 15*(2), 123–139.
[10] Kane, G. C., Palmer, D., Phillips, A., Kiron, D., & Buckley, N. (2015). Strategy, not technology, drives digital transformation. *MIT Sloan Management Review*.
[11] Kane, G. C., et al. (2019). Accelerating digital innovation inside and out. *MIT Sloan Management Review*.
[12] López-Nicolás, C., & Soto-Acosta, P. (2010). Analyzing ICT adoption and use effects. *Industrial Management & Data Systems, 110*(2), 332–347.
[13] Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & Information Systems Engineering, 57*(5), 339–343.
[14] OECD. (2018). *Productivity statistics*. OECD Publishing.
[15] OECD. (2020). *Digital transformation in emerging economies*. OECD Publishing.
[16] Popovič, A., Turk, T., & Jaklič, J. (2021). Conceptual model of business value of business intelligence systems. *International Journal of Information Management, 58*, 102233.
[17] Porter, M. E. (1985). *Competitive advantage*. Free Press.
[18] Porter, M. E., & Heppelmann, J. E. (2014). How smart, connected products are transforming competition. *Harvard Business Review, 92*(11), 64–88.
[19] Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options. *MIS Quarterly, 27*(2), 237–263.
[20] Teece, D. J. (2007). Explicating dynamic capabilities. *Strategic Management Journal, 28*(13), 1319–1350.

[21] Tornatzky, L., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.
[22] Vial, G. (2019). Understanding digital transformation. *Journal of Strategic Information Systems, 28*(2), 118–144.
[23] Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital*. Harvard Business Review Press.
[24] World Bank. (2016). *World development report: Digital dividends*. World Bank.
[25] Zhu, K., Kraemer, K., & Xu, S. (2006). Electronic business adoption by European firms. *European Journal of Information Systems, 15*(6), 601–616.
[26] Zhu, K., & Kraemer, K. (2005). Post-adoption variations in usage and value. *Information Systems Research, 16*(1), 61–84.
[27] McKinsey Global Institute. (2018). *Digital globalization*.
[28] UNCTAD. (2019). *Digital economy report*. United Nations.
[29] Yoo, Y., Boland, R. J., Lyytinen, K., & Majchrzak, A. (2012). Organizing for innovation in the digitized world. *Organization Science, 23*(5), 1398–1408.
[30] Nambisan, S., Wright, M., & Feldman, M. (2019). The digital transformation of innovation. *Research Policy, 48*(8), 103773.*