eISSN 2522-1566
ISSUE 3 (37), 2026

MANAGEMENT

RECEIVED:
13 August 2026
ACCEPTED:
21 September 2026
RELEASED:
20 October 2026

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UDC 005.8:004.63:631.1:636

DOI 10.26661/2522-1566/2026-3/37-15

EVIDENCE-ORIENTED MANAGERIAL DECISION-MAKING FOR DIGITAL TRANSFORMATION OF BUSINESS PROCESSES IN AGRICULTURAL ENTERPRISES

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Abstract. Purpose. This paper addresses a practical problem that often appears after a digital project is introduced: managers can see that a technology is in use, but they may still lack enough evidence to explain what changed in the business process and whether the observed result can be attributed to that change. The aim is to develop an evidence-oriented decision mechanism for digital transformation in agricultural enterprises. Design/methodology/approach. The approach follows the chain from a documented digital intervention to a change in the managerial mechanism and then to a process-related outcome. It also considers regulatory and sustainability constraints, persistence of the result, and the strength of the available evidence. The logic is examined using documented cases of Ukrainian agricultural enterprises and open operational, financial, and contextual information. Findings. The analysis identifies six recurring situations: cautious scaling with stronger measurement, collecting missing evidence before an investment claim, changing an unsuitable KPI, using a strong enterprise as a benchmark without digital attribution, separating digital and non-digital changes, and using non-digital interventions as comparison cases. Five evidence levels distinguish descriptive evidence from stronger causal claims. Research limitations/implications. The open data are heterogeneous and do not support a common counterfactual design. Practical implications. The mechanism helps managers decide what can be acted on now and what must be measured first. Originality/value. The study links process evidence directly to the strength of the managerial decision rather than to an aggregate digital score.

Keywords: digital transformation, managerial decision-making, business process management, evidence, agricultural enterprise, digital investment, data governance, causal attribution.
JEL Classification: M10, M11, O33, Q12.

INTRODUCTION

Digital tools are now used in agricultural management at many points: monitoring, production planning, feeding, reproduction, equipment control, energy use, waste management, and financial reporting. Their presence, however, does not answer the question that matters most to a manager: what actually changed in the process after the technology was introduced? A better indicator may appear at the same time as a digital intervention, but the two events are not automatically connected. In agricultural production this distinction is particularly important because biological conditions,

feeding, animal health, housing, labor, investment in physical assets, and market conditions can change simultaneously.

This problem is easy to overlook when digital transformation is summarized by a maturity score or a list of implemented technologies. Such measures are useful for describing the current state of an enterprise, yet they are less convincing when they are used to justify a new investment or to claim an economic effect. A high digital score may coexist with weak evidence that management practices actually changed. The opposite situation is also possible: a process may improve even when no relevant digital intervention has been documented. An aggregate score can therefore hide the very link that needs to be examined.

The distinction has direct consequences for investment decisions. When a manager considers expanding an animal-monitoring system, a feeding platform, an energy-management solution, or an enterprise data system, it is not enough to know that the enterprise performs well. The decision should be tied to a defined process, a known intervention, a plausible change in managerial practice, and an outcome that belongs to that process. Parallel changes also need to be recorded. Otherwise, a successful result can be attributed to a digital project simply because both happened in the same organization.

An evidence-oriented view starts from a different question. Instead of asking which enterprise is the most digital, it asks what exactly is being claimed and what evidence supports that claim. This does not make maturity models or performance indicators unnecessary. It gives them a more limited and clearer role. They can describe readiness, context, or performance, but they should not compensate for a missing link between the intervention and the process outcome.

The paper therefore concentrates on the point where assessment turns into action. The proposed mechanism is intended to help management decide whether a digital initiative can be scaled, whether additional measurement is needed, whether the KPI should be changed, whether two overlapping interventions must be separated, or whether a digital-effect claim should simply be withheld. In this sense, the mechanism is a decision aid for a portfolio of digital initiatives rather than another ranking of enterprises.

LITERATURE REVIEW

Business process management research has gradually moved beyond the view of digital transformation as the purchase of new technologies. Kerpedzhiev et al. (2021) point to data-centric, adaptive, and context-aware capabilities as important directions for BPM. Putra and Mahendrawathi (2024) show that BPM can connect digital innovation with broader organizational transformation, while Moreira and Dallavalle (2025) emphasize that value emerges when digital innovations are embedded in process-management practices. Taken together, these studies suggest that the relevant object of analysis is not the technology itself but the way in which monitoring, coordination, control, or redesign of a process changes.

Digital maturity is one possible way to describe such change, although it does not solve every evaluation problem. Biernikowicz et al. (2025) report an empirical relationship between BPM maturity and digital maturity, and Segala et al. (2026) discuss how process-management maturity shapes the implementation of digital transformation. At the same time, Smajli et al. (2025) warn that maturity models are not universally comparable. Van Looy and Shafagatova (2016) make a related point from the performance-measurement side: business processes can be assessed through many indicators, but the indicator has to fit the process being examined. This matters for attribution because a strong KPI is not evidence of a digital effect if it belongs to another process. Vnukova, Lysenko, and Makovoz (2025) likewise treat digital maturity as a context-sensitive diagnostic construct and show that different types of enterprises can produce substantially different maturity profiles. Their result supports the use of maturity assessment as an input to managerial diagnosis rather than as a direct measure of process impact.

A separate body of research deals with the problem of drawing conclusions from observational data. Callaway and Sant'Anna (2021) demonstrate that difference-in-differences designs depend on explicit assumptions, especially when treatment starts at different times. Mithas et al. (2022) distinguish a plausible treatment effect from a simple statistical association. For agricultural and applied economics, Henningsen et al. (2026) stress the need to define treatment, timing, comparison units, and possible confounders before making causal statements. Shakina et al. (2026) show how synthetic-control methods can support IT investment analysis when a sufficiently structured time series is available. These studies have a practical implication: missing rollout dates or an unclear comparison group are not merely documentation problems. They limit what management can reasonably conclude.

Agriculture adds another layer of complexity. In the livestock-related processes represented in the empirical cases, sensors, monitoring platforms, computer vision, automated feeding, and integrated production data can influence day-to-day decisions. Losacco et al. (2025) describe this digital transition as a basis for more tailored livestock management, whereas Stygar et al. (2026) emphasize persistent barriers and uneven digitalization. The value of a system therefore depends on whether the information it produces changes a concrete management task - for example, how quickly a health problem is detected, how a feeding decision is adjusted, or how resource use is controlled. Evidence from one process should not be transferred to another simply because both processes belong to the same enterprise.

Sustainability creates a similar requirement for process relevance. Klessascheck et al. (2025) integrate sustainability objectives into process analysis and redesign, and Dallavalle (2026) reviews the broader sustainability agenda in BPM. In agriculture, León-Bravo et al. (2026) argue that the impact of digital solutions should be evaluated through indicators that match the specific context. Soma et al. (2026) examine agricultural digitalization from a systems perspective, while Parra-López et al. (2026) call for a shift from technology-centred smart farming to a wider systems view. These contributions suggest that an ESG-related claim should be tied to a material process outcome such as energy use, waste handling, emissions, animal welfare, or resource efficiency, rather than added as a separate score.

The literature provides useful tools for discussing BPM capability, digital maturity, performance measurement, causal inference, and sustainability. What is less clear is how a manager should act when these pieces of evidence are incomplete or point in different directions. A maturity score can describe readiness; a KPI can describe an outcome; a causal design can estimate an effect. The missing link is a practical rule that connects the available evidence with the decision that is justified at that moment. The project-based approach proposed by Lysenko and Makovoz (2024) introduced a staged view of digital transformation assessment. The present study develops that logic further by making the strength of the managerial decision dependent on the evidence available for a specific process claim.

PAPER OBJECTIVE

The objective of the paper is to develop and substantiate an evidence-oriented mechanism for managerial decisions on digital transformation in agricultural enterprises. The mechanism is intended to keep three elements separate - the digital intervention, the managerial change, and the process outcome - and to show what can be concluded when one of them is only partly documented. It also defines evidence levels, links those levels to practical managerial actions, and identifies what information should be collected before a stronger investment or causal claim is made.

Lysenko, S. (2026). Evidence-oriented managerial decision-making for digital transformation of business processes in agricultural enterprises. Management and Entrepreneurship: Trends of Development, 3(37), 214-227. https://doi.org/10.26661/2522-1566/2026-3/37-15

METHODOLOGY

The analysis is organized around a specific managerial claim rather than around the enterprise as a whole. For each case, the starting point is a documented digital change in a clearly defined business process. The next question is whether that change altered a managerial routine, information flow, monitoring practice, control rule, or decision. Only then is a process outcome considered. This choice is deliberate: treating the entire enterprise as the unit of analysis makes it too easy to explain an unrelated performance indicator by the mere presence of a digital system somewhere in the organization.

Six elements are used to describe the evidence chain. D refers to the documented digital or digital-technological change. EM captures the managerial mechanism affected by that change - for example, faster exception detection, more frequent monitoring, synchronization of production data, automated control, or better information for decisions. EP is the outcome that belongs to the same process. AN/ESG covers regulatory acceptability and material sustainability constraints that cannot be ignored simply because a KPI is high. S reflects whether the observed result persists over time. LE is the evidence level that can reasonably be assigned to the claim. These elements are considered in sequence, because a strong result at the end of the chain cannot repair a missing link at the beginning.

The evidence scale contains five levels. At LE=1, there is reliable information that a digital intervention exists, but its connection with the process or outcome is still weak. LE=2 is appropriate when comparable outcome dynamics are available but the digital contribution has not been identified. LE=3 requires a documented intervention and a localized managerial mechanism, even if the numerical size of the effect cannot yet be estimated. LE=4 is reserved for a valid comparative or quasi-experimental design with explicit identification assumptions. LE=5 requires an effect that remains stable across time or comparable settings and withstands robustness checks. The scale is therefore not a maturity ladder: an enterprise does not move upward simply because its KPI improves.

The empirical layer draws on documentary and open-data profiles of Ukrainian agricultural enterprises for which comparable operational indicators, financial dynamics, information on digital or digital-technological interventions, and contextual evidence on parallel non-digital changes are available. Public production registers and open financial reporting provide the background data, while enterprise and sector sources are used to identify the content of specific process changes. The cases are used diagnostically. They are not treated as a representative population; instead, they allow the proposed logic to be checked against different situations, including digital interventions, strong non-digital benchmarks, overlapping changes, unsuitable KPIs, and incomplete evidence.

For each claim, the analysis follows four practical steps. First, the process boundary and the digital intervention are recorded. Second, the expected managerial change and the nearest process-related outcome are identified. Third, parallel changes - such as genetics, feeding, physical modernization, herd structure, labor arrangements, or capacity expansion - are listed as alternative explanations. Finally, the available evidence is translated into an evidence level and a managerial response. Missing information is not converted into an arbitrary zero; it becomes a concrete information gap that limits the next decision.

Figure 1 presents this logic as a sequence of evidence checks. It should not be read as a maturity path that every enterprise must climb. The important point is the order of the checks: if the link between the digital intervention and the process is not documented, later performance indicators cannot by themselves justify a stronger claim.

eISSN 2522-1566
ISSUE 3 (37), 2026

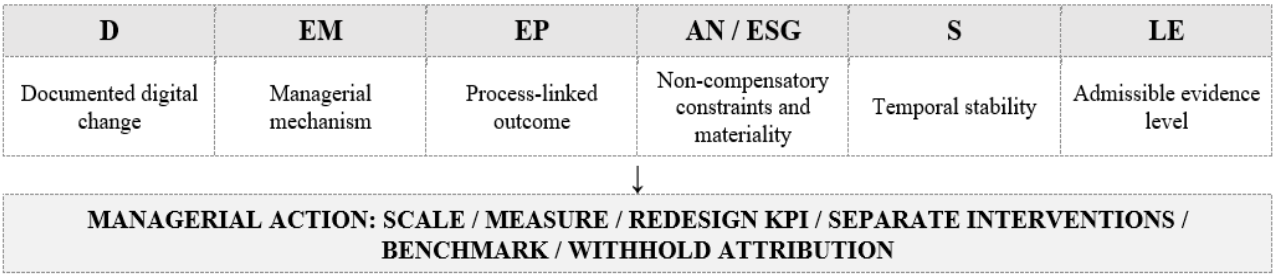


Figure 1. From a documented digital change to a managerial decision
Source: developed by the author.

RESULTS AND DISCUSSION

The proposed mechanism changes the question asked by a conventional digital scorecard. A scorecard usually asks where an enterprise stands relative to others. A manager, however, needs to know what to do next. Under the proposed logic, two enterprises with a similar performance level may require different decisions. A strong result without a documented digital intervention can still be useful as a benchmark, but it is not a reason to scale a digital project. By contrast, a well-documented intervention with a clear managerial mechanism may deserve continued use and better measurement even if the current KPI is only moderate.

A second point concerns attribution. In agricultural production, a process rarely changes for one reason only. Genetics, feeding quality, animal grouping, housing, veterinary protocols, reproduction management, workforce practices, and physical modernization may all change during the same period as a digital system. For that reason, an improvement after implementation is first treated as an observation. It becomes evidence of a digital contribution only when the intervention, the management change, and the outcome can be connected and competing explanations have been considered.

Process boundaries are equally important. Digital interventions may support animal health monitoring, feeding, reproduction, traceability, equipment control, energy management, waste treatment, or enterprise-wide data integration. The outcome used for evaluation has to match the process in which the intervention operates. An energy-management solution, for example, should be assessed through energy output, resource use, uptime, waste utilization, or a related environmental measure, not through an unrelated production KPI. This simple rule reduces the risk of choosing whichever indicator looks most favourable after the fact.

Missing data should also be treated as a management issue rather than a statistical inconvenience. If the rollout date is unknown, if user roles are not recorded, or if there is no event log or baseline KPI, the problem is not solved by assigning a zero or an expert score. The claim remains weaker, and the project team receives a clear task: collect the missing trace before asking for a stronger conclusion. In this sense, the quality of the evidence has to be designed together with the digital solution rather than reconstructed when the return on investment is questioned later.

These recurring situations are summarized in Table 1. The table does not rank enterprises. It shows how a manager can react when the evidence chain is complete in some places and incomplete in others.

The cases in Table 1 illustrate why a digital initiative should not be reduced to an approve-or-reject choice. In some situations the technology can be retained while measurement is improved. In others the main problem is not the technology but the absence of a rollout record or a suitable KPI. A high-performing enterprise may remain a useful benchmark without being classified as evidence of digital impact. Separating these situations is important because the decision to continue using a technology is not the same as the decision to claim that the technology caused a particular result.

Table 1

Managerial responses to different evidence situations

Evidence situation	How to read it	Recommended response	What should be recorded next
A. Digital change and managerial mechanism are documented; an outcome is visible; parallel changes remain	The process link is plausible, but the observed result may still have more than one explanation.	Continue the initiative or expand it cautiously, while building a stronger measurement design.	Confirmed rollout date; process owner; event logs; unit/animal/group identifiers; record of parallel changes.
B. The technology is known, but module, timing, or business rule is unclear	There is evidence of technology use, but not enough detail to reconstruct how management changed.	Do not make a causal or ROI claim yet. First restore traceability.	Module/version; activation date; user roles; business rule; process KPI before and after rollout.
C. The available KPI belongs to another process	The intervention may still be useful, but the chosen outcome cannot support the claim being made.	Change the measurement model and evaluate the intervention through an outcome from the same process.	A process-specific KPI and relevant timestamps; energy, resource, waste, health, or another material outcome.
D. Performance is strong, but no relevant digital change is documented	The enterprise is informative as a benchmark, not as evidence of a digital effect.	Keep it as a comparator and avoid digital attribution unless documentary evidence appears.	Comparable operational and financial KPIs; evidence of a digital intervention if later identified.
E. Digital change overlaps with genetic, feeding, physical, or scale-related changes	Several explanations remain plausible and cannot be separated with the current evidence.	Separate the interventions in time or analysis, or introduce a comparison before making a stronger claim.	Dates of modernization; cohort structure; genetics/feed changes; capacity changes; baseline and comparison data.
F. A non-digital managerial change is documented	The process changed without a digital treatment, which makes the case useful for comparison.	Use the case to test whether the evaluation method can distinguish digital from non-digital improvement.	Before/after process KPI; implementation date; comparison unit where available.

Source: developed by the author from the empirical case profiles and the process-and-evidence logic.

Table 2 introduces the evidence levels used in the mechanism. They describe the strength of a particular claim, not the maturity or quality of the enterprise. This distinction is important because evidence is not compensatory: a very high operational result cannot replace missing information about what changed, when it changed, or how the intervention affected the process.

Table 2

What each evidence level allows management to conclude

Evidence level	What can reasonably be said	Managerial use
LE=1	A digital intervention is documented, but its process link or outcome is still unclear.	Clarify the module, users, process boundary, and expected mechanism. Do not scale on the basis of an unrelated KPI.
LE=2	Comparable outcome dynamics are available, but the digital contribution is not identified.	Keep the result as descriptive evidence and collect timing, intervention records, and parallel changes before attribution.
LE=3	The digital intervention and its managerial mechanism are documented within the relevant process.	A cautious decision to continue or scale may be justified; a stronger evaluation design is needed for a numerical effect.
LE=4	A comparative or quasi-experimental design supports an effect estimate under stated assumptions.	Use the estimate in the business case, state the assumptions, and continue robustness checks.
LE=5	The estimated effect remains stable across time or comparable settings and survives robustness checks.	Scale or institutionalize the solution while continuing to monitor whether the result persists.

Source: developed by the author; comparative-design requirements draw on Callaway and Sant'Anna (2021), Mithas et al. (2022), Henningsen et al. (2026), and Shakina et al. (2026).

The scale changes how evidence is interpreted in an investment discussion. LE=1 or LE=2 does not mean that the technology is poor; it means only that the current documentation does not support a stronger statement. Conversely, LE=3 does not require an exceptional KPI. It requires a documented digital intervention and a credible explanation of how management in the relevant process changed. The level therefore describes what can be said with confidence, not whether a project is considered successful.

This distinction has consequences for the business case. Digital projects are often approved with an expected benefit, a budget, and an implementation schedule, while measurement is discussed later. The proposed approach reverses that order. Before implementation, management should agree on the process boundary, the process owner, a baseline period, the main outcome, the expected managerial change, and the most obvious parallel factors. During implementation, the actual activation date, module or version, user roles, configuration changes, and event logs should be retained. After implementation, the outcome can then be interpreted together with these records rather than in isolation.

These requirements can be used as a practical gate between stages of a digital investment. Moving from a pilot to wider rollout, for example, should depend not only on a financial threshold but also on whether the project can be evaluated. A minimum package might include a named process owner, a confirmed activation date, a primary KPI agreed in advance, a record of parallel changes, and an accessible digital trace. Such a gate does not create causal evidence by itself. It ensures that the next stage of evaluation remains possible.

The same logic applies to sustainability. Agricultural enterprises are expected to improve resource efficiency, waste management, animal welfare, energy use, and environmental performance, but these aims should not be attached to every digital project in a generic way. The relevant sustainability outcome has to belong to the process that the technology affects. A resource-management system can be linked to energy intensity, resource consumption, waste utilization, or system uptime. An animal-health tool can be linked to health events, treatment, welfare, reproduction,

or response time. This process-specific interpretation is consistent with sustainability-oriented BPM and systems approaches to agricultural digitalization (Klessascheck et al., 2025; León-Bravo et al., 2026; Soma et al., 2026).

There is also a data-governance implication. Evidence quality depends partly on how the digital project is implemented. If timestamps, identifiers, configuration changes, or event logs are discarded, later analysis may be impossible even when the system works well operationally. Data governance should therefore preserve not only secure and accurate data, but also the traces needed to understand what management changed and when. Table 3 groups these requirements by stage of the investment lifecycle.

Table 3

Evidence to retain at different stages of a digital investment

Project stage	Questions to settle	Evidence to keep	What the information allows management to decide
Before investment	What process is affected? Who owns it? What is the baseline and main KPI? What other changes may influence the result?	Baseline data; agreed business rule; planned comparison logic.	Whether the project can later be evaluated in a meaningful way.
Rollout	When was the system actually activated? Which module is used? Who uses it and for what decision?	Actual activation date; configuration history; event logs; identifiers; training/adoption records.	Whether the intervention can be located in time and linked to a process.
Post-implementation	What changed after rollout, over what period, and what else changed at the same time?	Process outcomes; exceptions; operational events; financial context; record of alternative explanations.	Whether the expected managerial mechanism is visible and whether a stronger design is feasible.
Scaling	What evidence threshold is sufficient? Which assumptions may not transfer to another unit or site? Which ESG risks are material?	Comparative results; robustness checks; implementation differences; context differences.	Whether scaling is justified now, justified with conditions, or should be delayed.

Source: developed by the author.

Table 3 makes one practical point clear: evidence collection begins before the project is completed. The technology team can document the system and its rollout, but the process owner has to define the operational change and the outcome that matters. If these responsibilities are separated, an enterprise may be able to prove that a system was installed while still being unable to show what management practice changed or which process result should be evaluated.

Benchmarking should be handled in the same disciplined way. An agricultural enterprise with strong performance and limited documentation of digital change remains useful as a comparator. Its productivity, process reliability, labor efficiency, or financial performance can provide a target. What should be avoided is the automatic label of 'digital leader' when the evidence only shows that good performance and technology exist in the same organization. Benchmark status and evidence of digital impact are different things.

eISSN 2522-1566
ISSUE 3 (37), 2026

Non-digital cases are also informative. A feeding protocol, a change in reproduction management, a housing improvement, or a new division of responsibilities can improve a process without a new digital treatment. Such cases help test whether the method can distinguish digital transformation from other forms of managerial improvement. Keeping them in the analysis as comparison cases strengthens the method because positive change is not automatically classified as digital.

In practice, the decision process can be followed as a short cycle. Management first formulates one claim for one process and records the digital intervention. It then specifies what managerial practice should change and chooses the closest process outcome. Parallel non-digital changes are documented before an evidence level is assigned. The final step is not merely to label the claim, but to decide what information is needed next. When new data or a stronger comparison become available, the claim can be reassessed.

The theoretical contribution lies in bringing together ideas that are usually discussed separately. BPM provides the process boundary, managerial capability, and performance-measurement perspective. Causal-inference research explains why identification quality and competing explanations matter. Research on digital and sustainable agriculture shows why technology effects and ESG outcomes have to be process-specific. Combining these perspectives produces a decision framework rather than another maturity model.

This difference is important for management theory. Digital transformation is often described as movement toward a higher level of maturity, which encourages aggregation across dimensions. The present approach serves another purpose. It asks whether a particular statement about a particular process is sufficiently supported to guide action. A weak link between the intervention and the process cannot be repaired by strong financial performance, just as a large technology portfolio cannot compensate for weak attribution.

For managers who allocate a limited investment budget, this distinction is useful because projects can be treated differently without forcing them into a single ranking. Some may be ready for scaling; others may need better measurement, a redesigned KPI, or a pause in attribution. This also reduces the pressure to overstate benefits simply because a project has already been completed. A system can remain strategically useful even when its numerical causal effect has not yet been established.

The approach is particularly relevant when decisions must be made with fragmented data. Agricultural processes are affected by biological variability and by several interacting operational changes, so a simple before-and-after comparison can be misleading. Waiting for perfect evidence, however, is equally unrealistic. The proposed mechanism occupies the middle ground: it allows management to act, but requires the wording and strength of the decision to reflect the evidence actually available.

The study has several limitations. The empirical cases rely on open and documentary evidence rather than on one unified experimental dataset. Sources differ in timing, detail, and process coverage, and they do not provide a common counterfactual design. For this reason, the paper does not estimate a universal percentage effect of digitalization on agricultural enterprise performance. The mechanism should be understood as a way to discipline attribution and data collection, not as a replacement for experimental or quasi-experimental analysis where such designs are feasible.

Further research should apply the evidence levels to granular event data from enterprises and examine whether the proposed decision gates improve actual investment choices. Depending on rollout conditions, interrupted time series, staggered difference-in-differences, synthetic control, matched comparisons, or controlled pilots may be appropriate. Another useful direction is to define process-specific ESG evidence for animal welfare, energy, waste, emissions, and resource efficiency so that sustainability claims are assessed with the same care as productivity claims.

CONCLUSION

This paper proposes an evidence-oriented mechanism for managerial decisions on digital transformation in agricultural enterprises. Its main purpose is to keep the digital intervention, the managerial change, and the process outcome analytically separate. Regulatory and sustainability constraints, the persistence of the result, and the quality of the evidence are then considered before a decision is made. The central principle is straightforward: the claim should not be stronger than the evidence supporting it.

The mechanism uses five evidence levels and distinguishes several recurring decision situations. It can separate a strong benchmark from a case of documented digital impact, identify when a KPI belongs to the wrong process, and show when genetics, feeding, physical modernization, capacity changes, or other interventions remain plausible alternative explanations. Missing rollout information or process traces are therefore treated as information gaps to be closed, not as values that can be hidden inside an aggregate score.

For practice, the most important recommendation is to plan the evidence together with the digital initiative. Before rollout, managers should define the process, baseline, owner, main KPI, expected managerial change, and foreseeable parallel factors. During rollout, they should retain activation dates, module information, user roles, configuration history, identifiers, and event logs. After rollout, the observed outcome can be interpreted together with this record before management moves from continuation to scaling or from association to a causal statement.

The approach does not require perfect evidence before every decision. It requires a proportionate decision. This creates a practical connection between digital strategy, process governance, and evaluation design. Future work can strengthen the mechanism with longitudinal enterprise data and comparative designs and can extend the same process-specific logic to animal welfare, environmental performance, energy, and resource-efficiency outcomes across agriculture.

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ДОКАЗОВО ОРІЄНТОВАНЕ ПРИЙНЯТТЯ УПРАВЛІНСЬКИХ РІШЕНЬ ЩОДО ЦИФРОВОЇ ТРАНСФОРМАЦІЇ БІЗНЕС-ПРОЦЕСІВ АГРОПІДПРИЄМСТВ

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У статті розглянуто практичну проблему, яка виникає після впровадження цифрового рішення: технологія вже працює, але наявних даних недостатньо, щоб упевнено пояснити, що саме змінилося в бізнес-процесі та яку частину результату можна пов’язати з цифровим втручанням. Метою дослідження є розроблення доказово орієнтованого механізму прийняття управлінських рішень щодо цифрової трансформації бізнес-процесів агропідприємств. Запропонований підхід послідовно пов’язує документовану цифрову зміну зі зміною управлінського механізму та найближчим процесним результатом. Окремо враховуються нормативні й ESG-обмеження, стійкість результату в часі та рівень доказовості. Логіку підходу перевірено на документованих кейсах українських агропідприємств із використанням відкритих операційних, фінансових і контекстних даних. За результатами аналізу виділено шість типових управлінських ситуацій: обережне масштабування з посиленням вимірювання;

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накопичення відсутніх доказів до інвестиційного або причинного висновку; заміна нерелевантного KPI; використання сильного підприємства як бенчмарку без цифрової атрибуції; розмежування цифрових і нецифрових змін; застосування нецифрових втручань як порівняльних кейсів. Запропоновано п’ять рівнів доказовості, які показують, де закінчується описова інтерпретація і починається обґрунтований причинний висновок. Практичне значення підходу полягає в тому, що він допомагає менеджеру визначити не тільки можливе рішення, а й дані, яких бракує для наступного кроку.

Ключові слова: цифрова трансформація, управлінське рішення, бізнес-процес, доказовість, агропідприємство, цифрові інвестиції, управління даними, причинна атрибуція.