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Digital Transformation Disclosure, Product Innovation, and Market Performance: Financial Evidence from Indonesian State-Owned Pharmaceutical Cases

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Abstract: Digital transformation and product innovation may support pharmaceutical market performance, but research expenditure, product activity and realised sales are different measures. This study examines their reporting relationship in Kimia Farma and Phapros through a longitudinal documentary comparison of public reports covering 2021–2025. The detailed comparison uses 2024–2025 expense and sales information. Kimia Farma's observed research expense increases from 45.52 to 47.34 billion rupiah after combining separately reported manufacturing and administrative lines, while revenue declines by 7.20 percent. Phapros' manufacturing research expense decreases from 49.17 to 26.55 billion, while revenue rises by 26.34 percent. In Phapros, ethical and over the counter products account for the largest absolute sales increases, but the report does not isolate revenue generated by newly launched products. Digital narratives describe enabling infrastructure and customer channels rather than measured innovation returns. The contribution is a stage specific measurement framework that separates digital enablement, research input, product launch and commercial conversion. The findings do not identify a causal innovation effect or equate lower research expenditure with lower innovation capability.

Keywords: Digital Transformation Disclosure, Product Innovation, Research Expenditure, Product Mix, Market Performance.

INTRODUCTION

Pharmaceutical innovation is a process with several stages, while corporate reports often present a single year's research expense beside a product narrative and sales growth. Those items may refer to different periods and different scopes of activity. The present article asks what can be learned from their joint reporting in Kimia Farma and Phapros. It examines digital enablement, observed research input and changes in product category sales, without assuming that expense is innovation output or that current revenue is the return to a current launch. The contribution is a stage specific interpretation of publicly available financial evidence.

Digital transformation involves changes in organisational arrangements and value creation as well as the adoption of technology. Reviews distinguish this process from the

narrower conversion of information into digital form and show why its consequences depend on strategy, organisational design and the environment (Vial, 2019; Verhoef et al., 2021; Hanelt et al., 2021; Gong & Ribiere, 2021; Nadkarni & Prügl, 2021; Kraus et al., 2021; Kraus et al., 2022). The distinction matters for corporate reporting: describing an application is evidence of disclosure, but it does not establish the application's use, quality or financial contribution.

The resource based view explains why a purchased system does not automatically generate an advantage. Complementary skills, routines and organisational assets shape the use of technological resources (Barney, 1991; Bharadwaj, 2000; Wade & Hulland, 2004; Melville et al., 2004). Dynamic capabilities provide a related account of how firms identify opportunities and reconfigure resources (Teece et al., 1997; Teece, 2007). Information systems research also distinguishes system quality and information quality from organisational learning and strategic integration (DeLone & McLean, 2003; Tippins & Sohi, 2003; Bharadwaj et al., 2013). These distinctions require a reporting measure to be narrower than the capability it is intended to represent.

Marketing research connects market orientation and marketing capabilities to performance, while financial approaches examine how market based assets and advertising expenditure may enter shareholder value (Morgan et al., 2009; Morgan, 2012; Srivastava et al., 1998; Joshi & Hanssens, 2010). In digital settings, social media strategy, content, analytics and customer value creation provide different pathways rather than a single marketing expenditure mechanism (Dwivedi et al., 2021; Li et al., 2021; Hollebeek & Macky, 2019; Saura, 2021; Matarazzo et al., 2021; Ritter & Pedersen, 2020). Selling expenses therefore cannot be treated as a direct measure of digital marketing capability.

Evidence on analytics and artificial intelligence reinforces the need to measure resources and their organisational deployment separately. Reviews and capability studies address the processes through which information is converted into operational choices (Collins et al., 2021; Mikalef & Gupta, 2021; Mikalef et al., 2020; Wamba et al., 2017). A pharmaceutical firm can describe a digital infrastructure while leaving the extent of data integration, managerial adoption and customer conversion unreported. Pharmaceutical innovation also carries development costs and long lead times, making a contemporaneous revenue comparison a limited representation of the innovation process (DiMasi et al., 2016).

Indonesian studies help locate the analysis in its commercial and accounting setting. Research on over the counter medicines examines consumer responses to halal labels, brands and prices; it does not estimate the financial return to digital transformation (Ismail et al., 2022). Work on impairment allowances in state owned pharmaceutical firms highlights a separate financial reporting issue (Sova et al., 2023). A recent study of online reviews, website quality and trust provides consumer level evidence about purchasing mechanisms, rather than a transferable firm level coefficient (Ismail et al., 2026). These three studies motivate attention to trust, product signals and reporting quality without supplying observations for the present cases.

METHODS

The study is an exploratory longitudinal documentary comparison, conducted from publicly accessible reports retrieved on 2 October 2026. Kimia Farma and Phapros are purposively selected because their reports contain financial statements, technology narratives, product information and share trading summaries. Phapros is consolidated within Kimia Farma; the cases are analytically nested and are never pooled as independent firms. Bio Farma and Indofarma are outside the analysed corpus. The design follows document analysis and case based theory development, with literature used as an interpretive framework rather than presented as a systematic review (Bowen, 2009; Eisenhardt, 1989; Eisenhardt & Graebner, 2007).

The archive includes Kimia Farma's 2021, 2022, 2023 and 2025 annual reports, its reissued 2023 financial statements, and Phapros' 2021, 2022, 2024 and 2025 reports (PT Kimia Farma Tbk, 2022; PT Kimia Farma Tbk, 2023; PT Kimia Farma Tbk, 2024a; PT Kimia Farma Tbk, 2024b; PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2022; PT Phapros Tbk, 2023; PT Phapros Tbk, 2025; PT Phapros Tbk, 2026). Revenue context covers 2021–2025. Main financial comparisons use the latest accessible 2023–2025 comparative figures; the detailed expense, cash flow and valuation comparisons use 2024–2025. Earlier figures are not combined indiscriminately with later restatements. Amounts are converted to billions of Indonesian rupiah; ratios are recalculated from the underlying amounts.

Narrative evidence is read in context and classified as an organisational responsibility, an implemented activity or a quantified outcome. Searches in extracted report text locate candidate passages; inspection of the surrounding section determines eligibility. Training for community partners is excluded from company capability evidence. A missing disclosed amount remains missing, and the study does not invent a technology budget, customer conversion rate or innovation outcome. Coding is a single analytical reading; no independent second coder or interrater statistic is claimed.

The analysis uses transparent ratios and within case changes, with no regression coefficients or significance tests. A few nested corporate cases do not provide a basis for conventional cluster robust inference (Colin Cameron & Miller, 2015). Nor can contemporaneous annual comparisons identify a causal indirect effect, which requires stronger assumptions and a defensible temporal structure (VanderWeele, 2016). Corporate disclosure and earnings quality literature inform the separation of reported narratives, measurement choices and financial outcomes (Healy & Palepu, 2001; Dechow et al., 2010). The literature synthesis is purposive and its scope is disclosed explicitly (Snyder, 2019).

The observed research input includes the manufacturing and administrative research lines separately identifiable in Kimia Farma's 2025 financial statement notes, and the manufacturing research line in Phapros' notes. The values are not assumed to be complete innovation investment. Changes in reported Phapros product category sales are reconciled to total revenue, with differences from rounded amounts retained.

RESULTS AND DISCUSSION

Table 1. Measurement scope and evidential status

Measure	Observed evidence	Interpretation
Digital capability	Systems, governance and channel narratives	Disclosure evidence; direct capability unmeasured
Financial outcomes	Latest comparable statements for 2023–2025	Descriptive outcomes within each reporting perimeter
Expense and valuation detail	Comparable 2024–2025 notes and share summaries	Observed ratios; no identified treatment effect
Reporting context	Revenue and archive for 2021–2025	Statement vintages retained; no interpolation

Source: Authors' measurement audit of the public reports (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026; PT Kimia Farma Tbk, 2024b; PT Phapros Tbk, 2025).

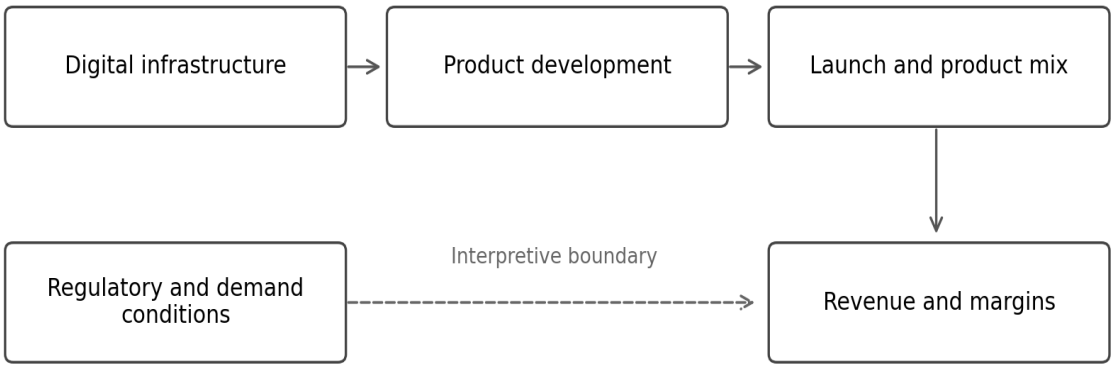
Separating input, activity and output

Digital infrastructure can support product information, coordination and access to market, but its presence does not identify a new product. Research expenditure is an accounting input and may relate to several projects. A launch is an activity with a date and product

definition. Market performance is an outcome that could include revenue, contribution margin, adoption or market share. Each stage requires its own observation.

Kimia Farma's reported technology organisation and Phapros' enterprise system and digital channel arrangements provide evidence of enabling resources. Their reports also describe product and development activity. However, a consistent series of launch dates, new product revenue and comparable market shares is not available in the extracted financial corpus. The study does not convert the number of product mentions into a count of innovations (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026).

Capability theory allows digital resources to support organisational renewal, but does not equate resources with successful commercialisation. The distinction is particularly relevant in pharmaceuticals, where development cost and timing can separate research input from eventual sales. A financial comparison therefore needs to retain the difference between spending, the development process and the output of that process (Teece, 2007; Hanelt et al., 2021; DiMasi et al., 2016).



Source: Authors' conceptual synthesis. Arrows represent proposed links, not estimated effects.

Figure 1. Interpretive framework and its measurement boundary

Research expense depends on accounting location

Kimia Farma reports research and development in manufacturing overhead and in general and administrative expenses. The 2025 figures are 26.59 and 20.75 billion rupiah respectively; their corresponding 2024 figures are 13.90 and 31.62 billion. Combining the two observed lines gives 47.34 billion in 2025 and 45.52 billion in 2024. Reading only the administrative line would produce a decrease, while reading the combined observed amount produces a small increase (PT Kimia Farma (Persero) Tbk, 2026).

The resulting observed expense intensity rises from approximately 0.46 to 0.51 percent of revenue. Both the modest change in the numerator and the reduction in revenue contribute to that movement. The calculated amount is described as observed research expense rather than total innovation investment. It does not include any unobserved capitalised development, embedded employee effort or spending that cannot be separately identified.

Phapros reports research and development of 26.55 billion rupiah in 2025 and 49.17 billion in 2024 within manufacturing overhead. The observed intensity falls from approximately 6.60 to 2.82 percent. It is not directly comparable to the broader group's combined scope as a ranking of innovation effort. The two reporting scopes and the parent subsidiary relationship have to remain visible (PT Phapros Tbk, 2026).

These accounting distinctions are substantively important. A researcher who uses whichever research line first appears in an annual report can reverse the direction of the Kimia Farma result. A researcher who ranks the firms by intensity can also confuse accounting scope

with innovation strategy. The reporting literature supports careful treatment of financial recognition and comparatives rather than treating a variable label as a complete construct (Dechow et al., 2010; Sova et al., 2023; Healy & Palepu, 2001).

Table 2. Observed research expense by accounting location

Case and year	Manufacturing	Administration	Observed sum	Sum / sales %
Kimia Farma 2024	13.90	31.62	45.52	0.46
Kimia Farma 2025	26.59	20.75	47.34	0.51
Phapros 2024	49.17	NA	49.17	6.60
Phapros 2025	26.55	NA	26.55	2.82

Source: Authors' extraction and calculation; amounts in billion rupiah. NA denotes an unextracted separately identifiable line, not zero innovation expenditure (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026).

Product mix and commercial recovery

Phapros' 2025 sales recovery is distributed across several reported product categories. Ethical medicine rises by approximately 87.54 billion rupiah and over the counter products by 59.66 billion. Generic products rise by 41.49 billion and the Lucas category by 17.90 billion, while toll manufacturing falls by 10.40 billion. The category changes approximately reconcile to the reported total increase after rounding.

The categories show where revenue recovery occurs, but they do not distinguish existing from newly launched products. Nor do they identify whether digital promotion, product availability, procurement contracts, prices or conventional distribution created the increase. The over the counter consumer literature suggests that brands, product signals and prices can matter to purchases, but does not isolate these category movements in Phapros (Ismail et al., 2022).

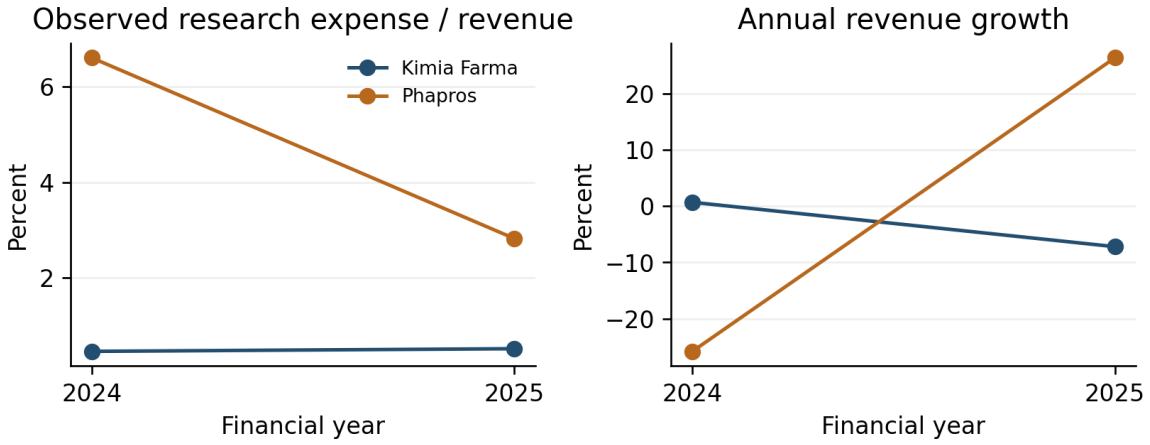
Kimia Farma's overall revenue declines in 2025 while its observed combined research expense increases modestly. Phapros' revenue increases while its observed manufacturing research expense declines. These opposite contemporaneous patterns caution against a single year spending to sales interpretation. They are consistent with the possibility of lagged effects and different project portfolios, but the dataset does not identify either explanation.

The financial trajectories also show that a commercial rebound and an innovation outcome should not be conflated. Phapros returns to a positive net margin, but research expenditure and new product sales are not linked at the project level. Kimia Farma narrows its loss, but the aggregate group outcome combines several lines of business. A model of innovation performance would need product specific scope and a credible period for commercialisation rather than a pooled comparison of these accounting totals.

Table 3. Phapros product category contribution to 2025 sales recovery

Category	2024 sales	2025 sales	Change
Over the counter	138.118	197.782	+59.664
Generic	337.357	378.843	+41.486
Ethical	159.341	246.885	+87.544
Lucas	88.477	106.372	+17.895
Toll manufacturing	21.403	10.999	−10.404

Source: Reported category figures in billion rupiah. Changes recomputed from displayed amounts; minor differences from the report's change column reflect rounding or internal inconsistencies (PT Phapros Tbk, 2026).



Source: Authors' calculations from the identified public reports (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026; PT Phapros Tbk, 2025).

Figure 2. Observed research input and contemporaneous revenue growth

Digital enablement and a testable innovation sequence

The operational role of digital systems could be examined at specific stages: gathering market information, coordinating development, managing regulatory and product data, supporting distribution and informing customer choices. The relevant outcome differs at each stage. Faster information exchange does not establish a shorter approval period, and a digital sales channel does not establish the contribution margin of a newly launched product.

Marketing and analytics research suggests how these intermediate measures could be organised. Customer information and data driven decisions may support targeting and value creation, while digital content and trust can shape the communication around a product. These concepts provide hypotheses for later work, but they do not turn the current narrative into an observed innovation return (Saura, 2021; Matarazzo et al., 2021; Mikalef et al., 2020; Li et al., 2021; Hollebeek & Macky, 2019; Ismail et al., 2026).

A useful next dataset would identify each development project, its expense and capitalised spending, registration and launch dates, sales by product and channel, returns, collection periods and contribution margin. It would preserve discontinued projects and unsuccessful launches as well as successful products. Excluding failures would bias the account of innovation. A larger set of independent firms would be required for general financial inference.

The managerial implication is to report a small number of linked stage measures instead of a single broad innovation claim. A company can show how a digital initiative changes a development or commercial process, then show whether the change improves the result of a defined product. That structure would make operational learning visible and permit a later analysis of financial persistence.

The novelty of the present study is a stage specific measurement reconciliation, illustrated by research expense reported in different accounting locations and by sales recovery across established categories. It shows that the direction of an observed innovation input can depend on extraction scope, while revenue growth does not identify the contribution of new products. The result is a documented foundation for a later innovation model, rather than a causal finding manufactured from insufficient project data.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

Digital disclosure, research input and product category revenue describe different stages. Kimia Farma's combined observed research expense increases slightly while revenue falls; Phapros' observed manufacturing research expense decreases while revenue rises. Product mix identifies the location of recovery but does not establish new product commercialisation or a causal digital innovation return.

This study examined how digital transformation disclosure, product innovation indicators, and market performance are reflected in the public reporting of Indonesian state-owned pharmaceutical companies. The findings show that corporate reports provide evidence of digital initiatives, technological support, research activities, and product-related developments; however, these disclosures do not directly demonstrate realized innovation outcomes or financial returns.

The comparison between Kimia Farma and Phapros indicates that research expenditure, product category performance, and revenue movements do not follow a single consistent pattern. Changes in financial performance may occur alongside digital initiatives and product development activities, but the available evidence does not allow the identification of a direct causal relationship between digital transformation, innovation investment, and market performance.

The main contribution of this study is the development of a measurement perspective that separates digital enablement, innovation inputs, product activities, and commercial outcomes. This distinction is important because digital transformation and innovation processes in the pharmaceutical sector involve different stages, time horizons, and organizational mechanisms.

Overall, the study highlights that corporate disclosure should be interpreted carefully. Digital transformation narratives may indicate strategic direction and organizational efforts, but they should not automatically be considered evidence of successful innovation commercialization. Future assessments of pharmaceutical digital transformation should integrate operational indicators, product-level outcomes, and longer-term performance measures.

Limitations

This study has several limitations. First, the analysis focuses on two state-owned pharmaceutical cases, Kimia Farma and Phapros, which are examined within a specific corporate context. Therefore, the findings provide contextual evidence rather than a general representation of the entire pharmaceutical industry. Second, this study relies on publicly disclosed information regarding digital transformation, product development, research expenditure, and market performance.

Although corporate reports provide valuable insights, they do not fully reveal internal innovation processes, product development decisions, or the actual commercial contribution of digital initiatives. Third, the available financial information does not allow direct identification of the relationship between research expenditure, product launches, and sales performance. Product category changes and financial outcomes may also be influenced by other factors, such as market conditions, regulatory changes, pricing strategies, and distribution activities. Therefore, the findings should be interpreted as an exploratory assessment of reported evidence rather than a causal evaluation of digital transformation or innovation performance.

Recommendations

Future studies should assemble product and project level histories with launch dates, spending scope, revenue and contribution margins. Companies should reconcile research expense across accounting locations and distinguish new product results from established

category sales. Digital innovation effects should be tested only after the intermediate process and timing are observed.

Author Contributions

All authors contributed to the research design, development of the conceptual framework, data collection, analysis, interpretation of findings, manuscript preparation, and revision. All authors reviewed and approved the final version of the manuscript.

AI Disclosure Statement

AI-assisted tools were used during manuscript preparation to support language refinement, document organization, and research workflow assistance. All analytical decisions, interpretations, and conclusions were developed and verified by the authors. The authors take full responsibility for the accuracy and integrity of the final manuscript.

Data Availability

The source documents are public and their direct locations are listed in the references. The accompanying evidence package records the extracted data, calculation script and source inventory. No interviews, proprietary data or invented field observations are used. Narrative interpretations are limited to the identified reports.

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