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Information Technology Investment Disclosure, Marketing Efficiency, and Financial Sustainability in Indonesian State-Owned Pharmaceutical Cases

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Abstract: Financial sustainability depends on liquidity and cash generation as well as reported profit, yet technology narratives often omit comparable expenditure and operational return measures. This study examines technology investment disclosure, selling cost efficiency and financial sustainability in Kimia Farma and Phapros through a documentary longitudinal comparison. Public reports provide historical context for 2021–2025 and detailed financial comparisons for 2024–2025. Neither case supplies a consistent, separately identified technology investment series suitable for estimating an investment return. Kimia Farma's current ratio rises from 0.48 to 0.56 and its operating cash flow margin improves, but its net result remains negative. Phapros' current ratio rises from 0.95 to 2.29, while operating cash flow decreases despite a revenue rebound and a return to profit. Both selling expense ratios decline, but their compositions and revenue denominators differ. The contribution is a multidimensional reconciliation of commercial cost burden, liquidity and cash generation, with undisclosed technology spending retained as missing. The results show that recovery in one indicator does not establish a general digital investment effect or durable financial sustainability.

Keywords: Information Technology Disclosure, Selling Cost Efficiency, Liquidity, Operating Cash Flow, Financial Sustainability.

INTRODUCTION

The proposed connection between technology investment and financial sustainability raises two measurement questions. The first is whether the investment is separately observed. The second is whether sustainability is being inferred from profit alone. In pharmaceutical businesses, distribution costs, receivables, inventories and financing commitments can produce different movements in margins and operating cash. This article examines those distinctions in Kimia Farma and Phapros, asking what their public reports establish about technology

resources, commercial cost intensity, liquidity and cash generation. The title specifies disclosure because the reports do not provide a consistent technology investment series.

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 current ratio divides current assets by current liabilities. Operating cash flow margin divides net cash generated from operations by revenue and multiplies by 100. Liability exposure uses total liabilities divided by year end assets. Selling cost efficiency is proxied by the selling expense ratio; missing technology spending is not imputed.

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).

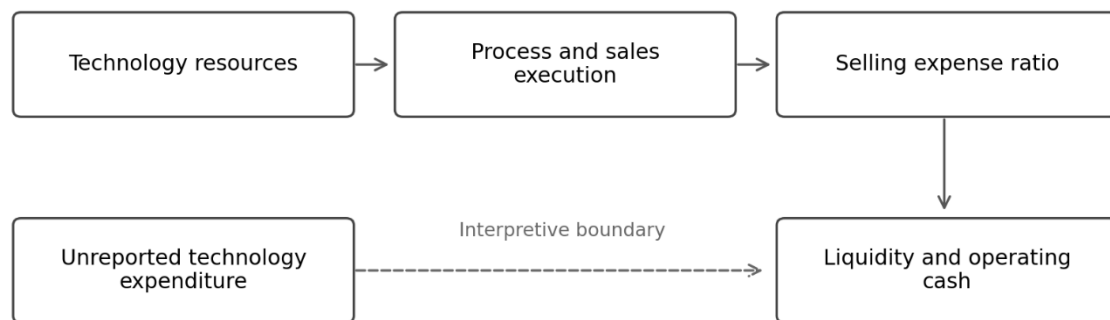
An investment amount cannot be inferred from a narrative

Kimia Farma describes a technology master plan, governance roles, application management and cyber security arrangements. Phapros describes enterprise system training,

digital access and information technology oversight. These activities entail resources, but the presence of a narrative does not identify expenditure. A hardware acquisition, software subscription, internal development activity and training programme may also be recognised under different accounting categories (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026).

The absence of a separately identifiable, comparable technology expenditure series is therefore retained as a finding about the measurement boundary. Total capital expenditure is not substituted for technology investment, and intangible assets are not treated as its complete stock. Those broader categories can contain other items and can omit expensed technology services. Without a reconciliation, their use would introduce an unobserved classification error.

The systems and capability literature supports the distinction between resources and returns. Technology can require organisational complements and changes in routines, while a measured financial benefit may appear after implementation. A return on technology investment calculation would require an observed expenditure, a defined deployment perimeter and an attributable benefit over a specified horizon. None of these requirements is met by a count of digital references in an annual report (Bharadwaj, 2000; Melville et al., 2004; Tippins & Sohi, 2003; Teece, 2007).



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

Figure 1. Interpretive framework and its measurement boundary

Selling cost efficiency is a bounded proxy

The selling expense ratio measures the share of revenue absorbed by reported selling costs. It is useful for monitoring cost burden, but is not a technical measure of marketing productivity. The numerator includes employee remuneration, distribution, depreciation and other items, while the denominator combines multiple products and channels. A lower ratio can result from cost reduction, revenue expansion or changes in accounting classification.

In 2025, the ratio falls from 22.80 to 19.67 percent in Kimia Farma and from 49.83 to 30.74 percent in Phapros. Kimia Farma's falling revenue partly offsets the ratio improvement produced by lower expense. Phapros benefits from both lower expense and a larger revenue denominator. These contrasts are material when the ratio is interpreted as marketing efficiency. A common direction in the final ratio does not imply the same process behind it.

The comparison is therefore kept at the level of reported selling cost efficiency. It does not quantify the number of customer conversions per unit of digital marketing spending. The distinction preserves the relevance of marketing capability theory without confusing a broad expense category with an ability to deploy commercial resources (Morgan, 2012; Morgan et al., 2009; Saura, 2021; Li et al., 2021).

Table 2. Liquidity, operating cash flow and profitability

Case and year	Current ratio	Operating cash	Cash margin %	Net margin %
Kimia Farma 2024	0.48	153.55	1.54	-12.16
Kimia Farma 2025	0.56	234.36	2.54	-4.81
Phapros 2024	0.95	141.28	18.97	-39.03
Phapros 2025	2.29	123.76	13.15	2.92

Source: Authors' calculations from statement amounts; operating cash flow in billion rupiah (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026).

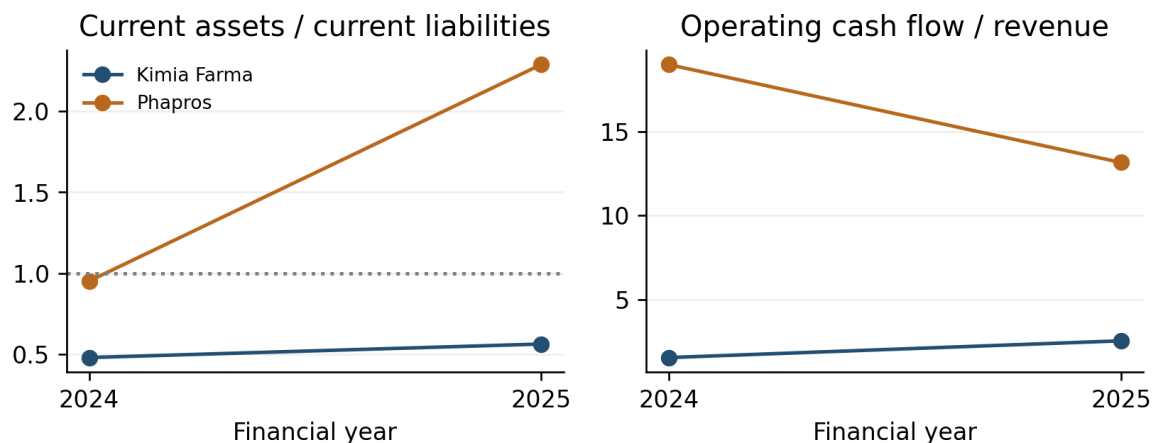
Liquidity, cash and profit tell different stories

Kimia Farma's recalculated current ratio improves from approximately 0.48 in 2024 to 0.56 in 2025. Both values remain below one, meaning current liabilities exceed current assets at each reporting date. This is a balance sheet observation rather than a forecast of default. A rounded ratio in a report should not replace the calculation from the underlying amounts, especially when the source labels or units are inconsistent.

The group's operating cash flow increases from 153.55 to 234.36 billion rupiah, and its cash flow margin increases from 1.54 to 2.54 percent. At the same time, the net margin remains negative and total liabilities represent approximately 80.71 percent of year end assets. The case records improvement in cash generation and a narrower loss while retaining a substantial liability burden. Calling that combination durable financial sustainability would exceed the short observation window.

Phapros' current ratio increases from approximately 0.95 to 2.29. The financial statements show current bank debt declining and noncurrent bank debt increasing between the reporting dates. The resulting maturity structure is important to the interpretation: a stronger current ratio can reflect a shift in the timing of obligations as well as stronger current resources. It should not be attributed automatically to digital operational efficiency (PT Phapros Tbk, 2026).

Phapros' operating cash flow decreases from 141.28 to 123.76 billion rupiah, while revenue increases and net profit turns positive. Its operating cash flow remains positive, but the margin falls from 18.97 to 13.15 percent because cash declines and the revenue denominator expands. Profitability, liquidity and cash conversion thus recover on different terms. This distinction is consistent with the need to examine earnings quality and financial reporting adjustments alongside commercial performance (Dechow et al., 2010; Sova et al., 2023).



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

Figure 2. Liquidity and cash flow margins need separate interpretation

Table 3. Technology input and sustainability measurement audit

Component	Evidence	Boundary
Technology investment amount	No consistent separate series	Return on investment cannot be estimated
Selling expense ratio	Lower in both cases	Broad cost burden rather than digital productivity
Current ratio	Improves in both cases	Point in time liquidity; maturity changes matter
Operating cash generation	Group rises; subsidiary falls	Profit recovery does not ensure higher cash flow

Source: Authors' interpretation of statement and narrative evidence (PT Kimia Farma (Persero) Tbk, 2026; PT Phapros Tbk, 2026).

A multidimensional assessment of sustainability

Financial sustainability is treated here as a continuing capacity that cannot be directly observed in two reporting dates. Liquidity, operating cash generation, profitability and liability exposure provide diagnostic components. They are reported separately rather than combined into an arbitrary score. A composite could conceal the group's continuing losses or the subsidiary's declining operating cash flow by averaging them with an improved current ratio.

The cases suggest different monitoring priorities. Kimia Farma requires attention to the persistence of cash generation, current liability coverage and its remaining losses. Phapros requires attention to whether commercial recovery produces consistent collections and whether its revised obligation maturities remain manageable. These are interpretations of the recorded figures and do not assert that any particular technology project caused the change.

A stronger reporting design would connect technology expenditure to process outcomes such as order handling time, stock availability, error rates and cash collection. It would then connect those outcomes to a commercial result net of operating and fulfilment costs. Analytics and artificial intelligence capability research explains why the organisational use of information matters at this intermediate stage (Collins et al., 2021; Mikalef & Gupta, 2021; Mikalef et al., 2020; Wamba et al., 2017).

For a later empirical study, the data architecture should separate capitalised software, equipment, subscriptions, external services and internal staff costs. It should also retain project deployment dates and allocation rules. A comparable technology series would make it possible to examine lagged outcomes, while a larger independent firm sample would make inference more defensible. The current corpus permits neither a technology return estimate nor a causal sustainability coefficient.

The distinctive contribution is a financial reconciliation that treats missing technology amounts as missing and examines cost burden, cash generation and liquidity independently. The contrast between Kimia Farma's cash improvement and Phapros' liquidity improvement demonstrates that a general narrative of digital recovery can compress financially different processes. Retaining those differences makes both the managerial diagnosis and the subsequent research design more precise.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The cases record lower selling cost intensity but different changes in cash, liquidity and profit. Kimia Farma's cash generation improves while losses remain; Phapros' current ratio improves while operating cash flow declines. No consistent technology investment series is observed, so an investment return or digital sustainability effect cannot be calculated.

This study analyzed information technology investment disclosure, marketing efficiency, and financial sustainability in Indonesian state-owned pharmaceutical cases. The findings reveal that companies provide information regarding technology initiatives, digital systems, and organizational arrangements; however, the available reports do not provide a consistent and separately identifiable technology investment series that allows direct evaluation of investment returns.

The analysis also shows that marketing efficiency indicators, particularly selling expense intensity, must be interpreted carefully. A reduction in selling expense ratios may reflect lower costs, revenue changes, or accounting classification differences rather than improved marketing productivity alone. Similarly, improvements in liquidity, profitability, or cash generation represent different dimensions of financial sustainability and should not be interpreted as a single outcome.

The contribution of this study is the development of a multidimensional perspective that separates technology disclosure, marketing cost efficiency, liquidity conditions, cash generation, and financial sustainability. This approach provides a more cautious interpretation of digital transformation-related financial evidence.

Overall, the study highlights that technology investment assessment requires transparent reporting of investment scope, implementation outcomes, and measurable operational impacts. Future research should combine financial analysis with operational technology metrics to better understand how digital investments contribute to sustainable business performance.

Limitations

This study has several limitations. First, technology investment is analyzed based on available disclosure information. The companies examined do not provide a consistent and separately identifiable technology investment series, making it difficult to evaluate actual investment returns. Second, marketing efficiency is assessed using reported selling expense intensity, which represents cost burden rather than a complete measurement of marketing productivity. Other marketing outcomes, such as customer acquisition, digital conversion, and channel effectiveness, are not directly available. Third, financial sustainability involves multiple dimensions, including liquidity, profitability, and cash generation. The observation period and available financial information limit the ability to assess long-term sustainability.

Recommendations

Companies should reconcile technology resources by accounting category and project, and report their operational outcomes before making financial benefit claims. Researchers should collect longer, independent firm histories and analyse cash, liquidity and profitability separately. Any composite sustainability measure should have an explicit theoretical basis and disclosed weighting.

Author Contributions

All authors contributed to research conceptualization, methodology development, data collection, analysis, interpretation, manuscript preparation, revision, and final approval.

AI Disclosure Statement

AI-assisted tools were used to support manuscript preparation and language improvement. The authors reviewed and validated all content and remain fully responsible for 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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