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Integration of Key Risks and Performance Indicators Using COSO-2017 in Medium Enterprise Fintech

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ABSTRACT

Key performance indicator is the ultimate goal pursued by financial technology companies. In most cases, the achievement of the goal has become major concern for top management. They need firmly mechanism to signal any possible risk that might interfere the process. At this context, the role of key risk indicator become very important. Unfortunately, focus in this issue is still rare and inconclusive. This research tries to propose conceptual framework to integrate key risk indicator into key performance indicators. Using COSO-2017 as the basic theory, we found that one alternative way is by combining both qualitative and quantitative risk analysis to detrude the key performance indicator in a quarterly basis. Series of medium enterprise financial technology company's past performance must be treated using proper statistical tools while setting the most ideal targets for each quarter, thus rebalancing the optimism from the top management. Henceforth, the availability of historical loss event data would be useful to measure probability of risk occurrence and its possible impact objectively. We provide a conceptual framework to deal with this issue, followed by assessment for selected performance indicator in medium enterprise fintech. The study enclosed with conclusion and direction for further agenda.

SARI PATI

Indikator kinerja utama (KPI) merupakan sasaran yang menjadi acuan strategi bagi perusahaan finansial teknologi berskala menengah. Sejumlah penelitian bahkan menemukan bahwa pencapaian target merupakan prioritas pertama dari program kerja manajemen puncak. Untuk itu, perusahaan membutuhkan sebuah mekanisme yang dapat memberikan sinyal awal akan hadirnya risiko yang berpotensi mengganggu upaya pencapaian tersebut. Pada konteks ini, peran indikator risiko kunci (KRI) menjadi sangat vital. Sayangnya, penelitian di bidang ini masih sangat terbatas dan kurang terarah. Studi ini berupaya untuk mengusulkan cara integrasi antara KRI ke dalam KPI. Dengan menggunakan COSO-2017 sebagai teori acuan, penelitian ini menemukan bahwa salah satu alternatif yang dapat dipilih adalah dengan mengkombinasikan analisis kuantitatif dan kualitatif untuk menurunkan KPI ke dalam target triwulanan. Untuk menghasilkan target secara obyektif maka kajian statistik atas data-data kinerja masa lalu harus tetap dilakukan sebagai penyeimbang optimisme manajemen puncak. Studi ini mengajukan sebuah kerangka berpikir sistematis untuk melakukan proses integrasi tersebut yang dilengkapi dengan asesmen kuantitatif atas satu KPI terpilih dari sebuah perusahaan finansial teknologi berskala menengah.

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INTRODUCTION

Five years after the Covid-19 pandemic, the business and industrial world in the country continues to improve, one of which is in the financial technology sector. Efforts to catch up on performance during the 2020-2022 period were carried out by sharpening the company's strategy in achieving its main performance indicator targets. It should be realized that this economic revival is in a high-risk context. First, not all economic joints have completely recovered (Nugraha & Aini, 2022), not only that, the action of seeking short-term profits still dominates the market (Ni'mah, 2022). This situation has spontaneously put the company in a fairly chaotic situation. On the one hand, the company must maintain its sustainability in the long term, but on the other hand, there is a demand to immediately create profit.

Referring to COSO-2017, conditions like this require management expertise in formulating risk management-based strategies (Baker & Sobel, 2016; Beasley et al., 2010c, 2010b). Risk management can no longer be positioned as a protection mechanism when the strategy is implemented, but this risk consideration must be used since the strategy was formulated (Liu, 2023). This perspective automatically shows how management should view key performance indicators (KPI) with key risk indicators (KRI) as two important pillars of a strategy ((Baker & Sobel, 2016; van den Brink & Leipoldt, 2022).

According to (van den Brink & Leipoldt, 2022), the determination of key risk indicators must start from key performance indicators, taking into account the opportunities for changes in industry dynamics, the courage of top management in taking risks and the optimism of the management team as a whole. In this way, key risk indicators will be able to function as an early warning system for the emergence of events that will create losses in the future (Bondarenko et al., 2021; Hager & Vormeland, 2016; Silvério & Pestana, 2022; Vikaliana, 2018). Unfortunately, research that looks at how the integration between the two is still very limited (Beasley et al., 2010c; Mouatassim & Ibenrissoul, 2015; Scarlat et al., 2012; Strachnyi, 2015).

This study attempts to answer two problem formulations: first, what is the right approach to use in integrating key risk indicators into key performance indicators and second, how is the approach applied in the context of selected KPIs from the work program of a medium-scale financial technology institution. Furthermore, the explanation of the two problem formulations is explored through a case study method at a medium-scale financial technology institution.

The object of this research is one of the medium-scale financial technologies in Indonesia that manages public funds. In the guidelines for its main tasks and functions, this company is mandated to guarantee the security of investment funds invested by the public. Therefore, the company is required to achieve its main performance indicators, namely maintaining liquidity stability in the short, medium, and long term. This is because the high threat of risk, such as potential illiquidity, will have a systematic impact on other economic actors. This means that integration between key risk indicators and key performance indicators is an absolute requirement.

This research report is divided into several parts. In the first part, this study explores several theories and concepts related to how key risk indicators are constructed and the extent to which they are relevant to key performance indicators. Next, the research method used in this study will be explained, as well as a brief description of the research object. The fourth part is the analysis and discussion that will answer both problem formulations objectively. This report will be closed with conclusions and directions for further research in the same field.

THE COMPREHENSIVE THEORETICAL BASIS

Key Risk Indicators

One of the functions that is emphasized in COSO-2017-based risk management is control. The effectiveness of the risk management system is largely determined by the extent to which the system can detect early on the potential for a risk to arise, so that management can immediately formulate an appropriate response in dealing with the incident (Scarlat et al., 2012). This principle opens up opportunities for the presence of the concept of key risk indicators, or what is now known as KRI (Bondarenko et al., 2021; Kazbekova et al., 2020).
This key risk indicator can be viewed as an early warning tool for the potential presence of risk. The analogy is the engine indicator light on the vehicle dashboard. When the light comes on, the owner is informed that there is a risk in the vehicle's engine. If it is not immediately checked and repair efforts are not taken, the risk will be converted into a problem, such as the vehicle engine suddenly turning off.

This understanding automatically places KRI from the overall engine performance (KPI) section. The light on the KRI indicates that the probability of the presence of risk increases in a short time, so that the alertness of the risk owners also increases. This preparedness will also determine the effectiveness of management efforts in responding to risks.

Several studies conducted by (Baker & Sobel, 2016; Beasley et al., 2010b; Boateng et al., 2022; Rodríguez-Rivero et al., 2020; Vikaliana, 2018) show that the methodology in determining KRI must be built in such a way that it meets the principles of objectivity (Mouatassim & Ibenrissoul, 2015), is right on target (Guertler & Spinler, 2015), is measurable (Hong & Kim, 2015) and most importantly can function effectively (Beasley et al., 2010a; Skorobogatova et al., 2021).

Conceptually, (Scandizzo, 2005) explains that one effective way to determine KRI is to derive it from existing KPIs. With a focus on the study of banking operational risk, this study explains that the same as KPIs, KRIs must be detectable with the same measurements. For example, if within a period of one month the company is required to minimize the potential for theft of customer funds through data hacking mechanisms to a maximum of 3 (three) cases with a maximum total loss tolerated of Rp. 60,000,000,- (sixty million Rupiah) then the formulation of KRI can be done through the following stages. First, risk managers must determine how much risk capacity is in accordance with the company's risk tolerance. Determination of this capacity can be done by considering existing regulatory demands and the company's resource capabilities.

In the second stage, risk managers need to identify what factors can trigger the risk of data hacking at the potential level of loss. Then, based on these factors, a weighting process needs to be considered to select the main key indicators (KRI). Furthermore, in the third stage, the process of identifying additional criteria is carried out to detect when the KRI will be activated. One weakness in the practice of determining KRI is that many determinations are still carried out qualitatively (Jiménez-Rodríguez et al., 2018; van den Brink & Leipoldt, 2022; Young, 2012), so that no measure can be monitored objectively. This is what is predicted to make KRI unable to function effectively.

KRI, KPI and COSO-2017

As one of the risk management guidelines, COSO-2017 is a further development of COSO-2004, COSO-2007 and COSO-2013. When compared to the ISO version, COSO always emphasizes the integration between strategy and risk management (van den Brink & Leipoldt, 2022). This principle even makes each version unique so that it is difficult to justify that the latest version must eliminate previous versions. Furthermore, these special characteristics are what make the old version still used in companies that are indeed in principle and need to be considered appropriate with a version.

The COSO-2017-based risk management framework can be seen in Figure 1. In the figure, it can be seen that COSO consistently emphasizes that risk management is an integrated part of the company's

strategy management process.

Figure 1. COSO-2017 risk management basis
Source: (Prewett & Terry, 2018)

In the management framework, the output of step 9 (nine) is the key performance indicator (KPI). This indicator is generally presented quantitatively so that the achievement measure can be monitored periodically (Kazbekova et al., 2020; Prewett & Terry, 2018; Sianitawati & Prasetyo, 2022).

When the KPI has been successfully derived in a shorter period (such as quarterly), then starting from step 10 (ten), management needs to immediately identify any incidents that have the potential to distance the company from its KPI target. This is where the presence of key risk indicators (KRI) is needed as an early warning system. If the KRI light is on, management must be responsive to immediately change the strategy in order to continue to achieve the KPI target according to plan (Hager & Vormeland, 2016; Silvério & Pestana, 2022).

Furthermore, KRI lights also need to be formulated in stages starting from early detection, intermediate detection and final detection, where in final detection, in a certain calculation, the feared risk will appear. As a result, when early detection occurs, it is possible that management still has enough time to choose an alternative: first, change the strategy after observing the conditions that occur, or second, immediately implement the risk response plan. In this way, management will be able to avoid risks or even reduce the potential losses that will be incurred.

This KRI monitoring mechanism is believed to create strength for companies to protect efforts to achieve KPIs according to plan (Baker & Sobel, 2016; Beasley et al., 2010c). This finding is also what makes the COSO-based risk management framework increasingly adopted by the industrial world, especially in financial institutions.

METHODS

This study uses a qualitative approach with a case study method. This method was chosen because it has been proven to be able to assist researchers in analyzing complex problem formulations (Baxter & Jack, 2015; de Vries, 2020).

The study of the first problem formulation was carried out by conducting a literature review on several previous studies, related to how KRI is built within the company. The expected result is a framework of thinking that is proposed in this study. Furthermore, in the second step, the proposed framework of thinking will be validated on the research object.

This validation process is carried out through several techniques. First, for the process of deriving KRI from one selected KPI, a focus group discussion process was carried out involving 1 (one) top management person in charge of risk management and 4 (four) staff at the BOD-1 and 2 levels as daily risk managers.

After the KRI is determined, the next step is to identify the factors that have the potential to cause the KRI light to turn on. This process is carried out by conducting focus group discussions in 2 (two)

groups, namely 6 (six) risk owners at the work unit leader level as the first group and 4 (four) daily risk management staff above (at the BOD-1 and 2 levels) as group 2. The results of the identification of the first group are then compared with the results of a statistical study of the data obtained by group 2 to justify the triggering factors for the KRI. The final step is to design a monitoring model for the selected KRI and KPI.

In the validation stage of the proposed framework, this study uses a medium-scale financial technology company. This company was established in 2014. Until the end of 2024, the total value of managed funds will reach more than 10 trillion Rupiah. The large amount of managed funds requires the company to be more careful in dealing with risks. Currently, the company has been equipped with a risk management policy that is certified to global standards.

The policy has also been equipped with standard operating procedures, especially in the field of risk monitoring. In the last evaluation, the company's risk maturity level was at a level above 3.20, so to increase the effectiveness of the management system's performance, it is necessary to ensure that risk management has been carried out measurably. In this context, the quantitative risk management paradigm is needed. Based on these considerations, this study attempts to use the proposed conceptual framework approach in compiling KRI into one of the KPIs, namely, from the revenue side.

RESULTS AND DISCUSSION

Proposed framework for determining KRI

This study carries the basic idea of COSO-2017, which emphasizes that risk management is an integrated part of strategic management. This means that risk consideration and management must be carried out since management attempts to formulate strategies in achieving KPI targets. Furthermore, the placement of the word 'integration' between KRI and KPI automatically eliminates the meaning of stages (sequences) that have been understood so far.

Figure 2. Risk management, strategy and performance as a whole

Similar to other risk management methodologies, COSO-2017 targets business sustainability as the main objective of the corporate governance principles. One different thing is the way COSO views the relationship between strategic management, risk management, and corporate performance achievement.

At the technical level, the implementation of this perspective can be explained as follows: in the first stage, the determination of key performance indicators (KPIs) is carried out with risk management considerations. In this stage, KPIs need to be formulated by looking at historical data between targets and performance achievements for the last 3 (three) to 5 (five) years. Identification of

growth rates (for example, from the revenue side), both recorded in the Annual Work Budget Plan (RKAT) and in the audited financial statements, is carried out to obtain an objective picture of the possibility of internal and external factors that create risk.

In the second stage, the KPI for a duration of 12 (twelve) months of operation is reduced to a shorter control duration, which can be in a duration of 6 (six) months or 3 (three) months. This reduction certainly cannot be done proportionally (divided equally by the number of durations). On the contrary, risk management considerations direct us to consider the company's ability to achieve targets with the availability of resources as a constraint. For example, if the KPI is reduced in a semester duration, then the target derivatives at the end of the first and second semesters will each be determined from historical performance data for the last 3 (three) to 5 (five) years. This effort is made so that management can understand the patterns (seasons) that are consistently faced by the company in the long term.

After the KPI is in a shorter duration (referring to the previous example, which is a semester), risk management considerations return to looking at the relevance of the proposed alternative strategies. This aims to see the feasibility of the strategy in achieving the KPI target in the short term. So at this stage, the risk assessment process (identification, analysis, risk priority) is carried out. The output of this stage is the quantitative value of the risk of each alternative strategy and work program. For each alternative strategy that has a risk above the company's tolerance limit, it must be replaced with another alternative strategy that has a risk potential that is still within the company's resource capacity.

Then for each selected strategy, a risk assessment is carried out again. This time the risk management unit will collaborate with the risk owner to identify each risk that has the potential to arise. This is the element that is then known as the key risk indicator (KRI).

Conceptually, KRI should function as an early warning system. Therefore, KRI must be built quantitatively so that it is easier to measure with a formula that is understood by all risk owners and does not produce different interpretations. This is very important considering that when the KRI light comes on, it is possible that the company only has a short time to immediately change its strategy, in order to save its performance achievement efforts.

Similar to the Bank financial services industry, KRI can be built in 3 (three) detector degradations: early detection, advanced detection, and final detection. Where, after the final detection is identified, this means that in a matter of days or hours, the risk will occur.

The risk response that needs to be prepared for each level of KRI also needs to be differentiated based on the level of urgency. When the early detector light is on, the risk response according to the plan in the risk register must be carried out immediately according to the plan. Furthermore, when the advanced detector lights up, additional resources must be immediately provided to carry out risk response efforts.

Finally, when the final detector lights up, it is time for management to immediately change its strategy to continue to achieve the company's performance targets (KPIs). This perspective shows that when the three elements (KRI, KPI and strategy) are integrated as one unit, the company will always be reminded to prepare:

1. A risk response that is ready to be implemented,
2. Risk owners with a high level of competence to implement the risk response,
3. Backup resources that are ready to be implemented in time, and
4. Backup strategy if the main strategy is no longer valid

This preparedness will increase the effectiveness of the risk management system in ensuring the achievement of KPIs. The proposed KRI determination flow in the explanation above is presented in Figure 3.

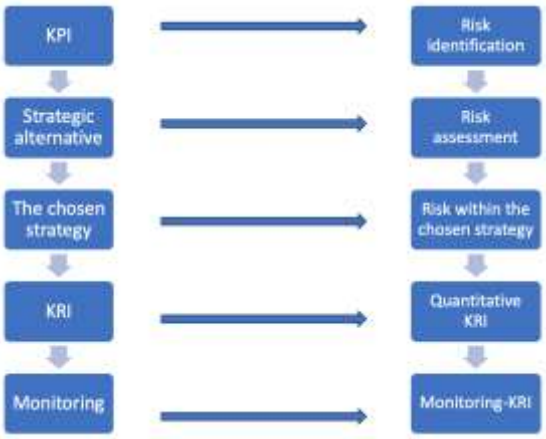

Figure 3. KRI determination flow

KRI determination simulation

After successfully submitting the framework for determining KRI, in this section, validation will be carried out by applying it to the selected KPIs in the Annual Work Budget Plan of a medium-scale finansial technology company for 2025. Referring to the proposal in Figure 3, of the 6 (six) main steps available, KRI determination begins at stages 4 (four), 5 (five), and 6 (six). Each of these steps will be explained in the following section.

Risk assessment of KPIs and lowering KPIs in a shorter duration

The KPI selected in this simulation is the revenue target for 2025 worth 350 billion Rupiah. The risk identification process is carried out by looking at the company's feasibility in achieving the KPI target. Based on the available data, the target of 350 billion Rupiah in 2025 is an increase of 9% from the revenue target in 2024 of 321 billion. Where the average increase in revenue targets during 2017-2024 is at 8% (using the arithmetic mean basis) and 7.8% (using the geometric mean basis).

When compared to previous years, the increase in 2025 (9%) is higher than the average increase in the last 8 (eight) years. On the other hand, the industry growth target was identified at 7.2%. This certainly triggers the risk of not achieving the KPI target. For this reason, the risk response step that can be taken is to review the KPI determination process through a weighting system between 3 (three) considerations.

Through focus group discussions conducted with top leaders in charge of risk management and the daily risk management team, the following weights were obtained: the subjectivity of the Board of Directors' opinion was given a weighting of 60%, the average achievement and target of the last 8 (eight) years was 30%, while the optimism of the implementing management was given a weighting of 10%.

The discussion on the KPI review resulted in a calculation that can be seen in Figure 4. From this calculation, the revenue growth rate was corrected by 0.24% to 8.76% or 349 billion Rupiah.

	Bobot	Nilai	Bobot x Nilai
Subyektifitas Direksi dan Komisaris	60%	9,40%	5,64%
Rata-rata pencapaian 10 tahun terakhir	30%	8%	2,40%
Optimisme manajemen BOD-1 (Rata2)	10%	7,20%	0,72%
			8,76%

Figure 4. KPI review calculation

Furthermore, in terms of realization, the average achievement during 2017-2024 was at 91% of the Annual Work Budget Plan target. For 2025, in the planning document, top management set a minimum achievement figure of 95%, an increase of 3% from the performance of the last 8 (eight) years. Uniquely, this condition must be achieved assuming the availability of resources as is currently the case.

For implementers, this target is considered quite high considering the average industry realization is at 93%. The reason is because market conditions are increasingly uncertain due to the tariff war carried out by the United States, so that adding new managed funds is quite difficult to do. In this context, a review was carried out again from the side of the target realization achievement. This step is carried out using the same weighting system as before as seen in Figure 5.

	Bobot	Nilai	Bobot x Nilai
Subyektifitas Direksi dan Komisaris	*60%*	*95%*	*57%*
Rata-rata pencapaian 10 tahun terakhir	*30%*	*91%*	*27%*
Optimisme manajemen BOD-1 (Rata2)	*10%*	*93%*	*9%*
			94%

Figure 5. Calculation of target realization review

In Figure 5, it can be seen that the realization target was corrected by 1% to 94%. At first glance, this correction figure looks very small, but with the optimism of member growth below 5% and considering the potential for members who do not routinely pay their policies or contributions, the decrease is considered quite significant for the implementers. After the KPI validation and realization target are completed, the KPI with a duration of 1 (one) year is reduced to a shorter duration, namely, quarterly. This reduction process is carried out by considering the quarterly revenue realization cycle for the last 8 (eight) years. The calculation results can be seen in Figure 5.

		Quarterly				Annually
		1	2	3	4	
2017 - 2024	Max	16%	23%	30%	31%	
	Average	15%	22%	29%	29%	
	Min	13%	20%	27%	27%	
2025	KPI	17%	23%	31%	30%	100%

Figure 5. KPI on Quarterly duration

Referring to the image, out of the 4 quarters in 2025, only the KPI targets in the first and third quarters are 1% above the maximum achievement point for the last 8 (eight) years. For this reason, determining the KRI is very urgent.

Determination of KRI

After the KPI has been successfully reduced in a quarterly duration, the next simulation stage is to determine the KRI quantitatively, namely, from the percentage of revenue realized. The main principle used is to see the quarterly KPI target as the minimum achievement limit. So that every achievement below the standard will be justified as a KRI. Then in the next step, what factors that trigger the emergence of the KRI and the appropriate monitoring procedures will be identified.

This study uses monthly realization data for the last 8 (eight) years to determine the KRI point, so that the determination is still based on the pattern that has occurred so far. Furthermore, management determines the threshold as the threshold for turning on the detector system. From the discussion, there is a managerial consideration that the detector will be operated at the beginning of each month in each quarter (namely January, April, July, and October). This is done so that management has the opportunity to implement risk responses more effectively or

change their strategies and work programs as quickly as possible. Based on these considerations, management agreed to use a figure of 2% below the target realization in those months as a threshold. The results of this calculation can be seen in Figure 6.

		Quarterly			
		1	2	3	4
2025	KPI Quarterly	17%	23%	31%	30%
	Treshold	2%	2%	2%	2%
	KRI first month for each quarter	3,53%	5,63%	8,20%	7,97%

Figure 6. Determination of KRI

In the calculation in Figure 6, KRI will be turned on if the realization of the revenue target during January reaches a maximum of 3.53%, or 5.63% in April, and this applies to quarters 3 and 4. In other words, so that KRI does not turn on, the revenue realization must be above the KRI threshold.

KRI Monitoring

After the KRI threshold has been successfully identified (Figure 6), the next stage is to build a KRI monitoring system every quarter. This stage begins with identifying factors that have the potential to trigger the emergence of KRI. This process is carried out with a focus group discussion with the daily risk management team (as explained in the research methods section).

The discussion began by mapping out what internal and external factors have the potential to ignite KRI (or in other words, make the company fail to achieve revenue realization in January more than the threshold of 3.53%, or 5.63% in April and so on for the first months in the third and fourth quarters. Several external factors, such as the emergence of new regulations from the Government that have the potential to increase the Rupiah value of revenue and the increasing allocation of subsidy funds provided by local authorities, were identified as triggers for creating performance. In other words, when these factors do not occur, the potential for KRI to ignite increases.

On the internal side, the factors identified as triggers for KRI are the level of effectiveness of policy premium collection from members. When the policy collectability level is low, KRI will automatically turn on, conversely, the more effective the collectability level is, the KRI will not turn on.

The next discussion was directed at giving weight to the external and internal factors above. From this session, each daily risk manager agreed to give a weight of 80% to external factors and 20% to internal factors. In this context, it can be seen that the performance of this institution is quite dependent on the policies of the top authorities. When the existing policies are not too biased, all KRIs will immediately turn on.

Technically, the monitoring mechanism for these KRI trigger factors needs to be carried out collaboratively, between the owner (work unit) and the risk manager (risk management unit). This is done to increase risk response from an early stage. For this reason, this study proposes the need for companies to build a detector system that hierarchically consists of early detectors, advanced detectors, and final detectors. This mechanism can be implemented through the KRI control format in Figure 7.

Quarter		1		
KRI		*Weight*	Risk value	Risk response
Achievement end of Jan	3,53%			
Triggered factor KRI	1,80			
Macro	1,6	80%	2	
Micro	0,2	20%	1	

Figure 7. KRI control

In Figure 7, it can be seen that the KRI will be ready to be turned on if the realization of revenue in January only touches below or a maximum of 3.53%. This potential realization can be monitored through the movement of the two trigger factors, namely, external (macro) and internal (micro) trigger factors. In this context, each risk owner (or head of work unit) collaborates with the daily risk manager (risk management unit) to monitor and provide risk values for each factor.

The risk value given is adjusted to the risk assessment guidelines that the company has, and has formally authorized its use. In this case, the institution has a 4 x 4 risk map, so that the value of the possibility and impact criteria of each risk will move from 1 (one) as a low level to 4 (four) as a very high level.

In the simulation example, it appears that the risk owner agrees with the manager to give a value of 1 to the macro (external) factor and 1 to the micro (internal) factor. Thus, it appears that both trigger factors are in the green category, or the KRI is not detected to be turned on.

The final simulation was carried out on the KRI detector system, which in Figure 3 (three) is divided into early, advanced, and final detectors. The determination of this detector is carried out quantitatively by considering the company's risk appetite and risk capacity. Referring to Figure 7, the detector mechanism can be seen in the KRI trigger factor value (which in the Figure 7 simulation is light green). If the trigger factor value is at 0.80, the system will provide a signal in the form of early detection, where the risk trigger factor has begun to be identified.

Here, the risk owner still has the opportunity to immediately implement the risk response efforts that have been previously planned in the work unit risk list. If the risk response is not carried out immediately, the trigger factor value tends to enter 1.80 (where in the company's risk map, the range of values more than 1.00 to 1.80 is already in the dark green quadrant - there is a color change from light green to dark green). The implementation of this risk response will be monitored periodically by the risk management unit.

Furthermore, if the trigger factor value shows a number above 1.80, the system will turn on the advanced detector. If not handled properly immediately, the trigger factor will continue to increase to 2.00. In this context, additional resources are absolutely necessary so that the risk response can run more effectively. In field observations (at the end of March 2025), this study found that when the early detector was on, the reaction of risk owners to immediately implement their risk response plans was still relatively slow. This is due to the high workload and lack of availability of human resources.

The results can be predicted, namely the low effectiveness of the response to the risk. Over time, the KRI trigger factor moved up to 1.82 (>= 1.80) at the end of April 2025, indicating that the advanced detector system was on. In that month, additional resources also did not arrive, so the risk response could not be carried out optimally. As a result, the first quarter KPI target of 23% of the total annual target was not achieved. Realization for that quarter was only at 11%. In such conditions, the final detector is on. The system reminds management to immediately change its strategy in order to achieve the realization target in the next quarter.

The illustration above shows how important the speed of risk response is when the KRI detector is on.

The company's failure to achieve targets in the first quarter creates a performance debt that must be paid off in the following quarter. In other words, a 12% shortfall in the first quarter's performance target will make the second quarter's target a total of 43%. Imagine if the market response has not fully recovered in the third quarter, it is almost certain that it will create an accumulation of performance debt in the last quarter.

MANAGERIAL IMPLICATIONS

The findings in this study indicate that the integration of KRI, KPI and strategy aims to build a protection mechanism for achieving company targets. However, to build integration properly, KRI needs to be formulated quantitatively and measurably so that it can be monitored periodically objectively. Therefore, before implementing this proposal, the company must first prepare a complete and accurate loss-event database. The goal is that historical performance achievement patterns can be studied properly. With the support of the right statistical tools, projections in terms of both possibility and impact can be made.

This study also found that in the context of medium-scale financial technology companies, the process of determining key risk indicators also provides a more objective perspective on the risk response efforts that need to be prepared. Through this approach, risk managers can measure the reactive power of all risk owners in implementing each risk response that has been planned in the risk register. If the reactive power is still low, risk managers can choose a simpler risk response option.

The principle that the most important thing in risk response is not on the strategic side but must be more directed at technical matters needs to be considered carefully. Through this method, risk owners will be accustomed to placing technical steps as risk response efforts in the company's risk register, and not just big steps that are more strategic. The final managerial implication of the results of this study is that the effectiveness of KRI is highly dependent on the risk awareness culture experienced by all members of the company. The silo system that is common among work units will actually weaken the level of risk awareness that exists. Each risk owner only pays more attention to events that are likely to occur in their work unit, without realizing that the risk will create a systemic effect on other work units. Slowly but surely, unmanaged risks in one unit will accumulate to the corporate level. When this happens, the threat of declining performance and company value cannot be avoided.

CONCLUSION

This study successfully identified the right integration process between key risk indicators (KRI), key performance indicators (KPI) and corporate strategy in the context of a medium-scale financial technology company. The integration process automatically makes the role of risk management increasingly vital in strategy formulation.

Furthermore, KRI can function as a control tool for achieving KPIs. This study successfully proposed the steps for determining KRIs both qualitatively and quantitatively. Validation of the proposed framework was then applied through simulation by taking one selected KPI from the annual work program of a medium-scale financial technology company.

The result was the establishment of an early, advanced and final detector system to see whether KRIs were on or not. The managerial implications of this study show the importance of the level of risk awareness of all risk owners in carrying out the KRI function. The reactive power of all risk owners has been proven to determine the speed of implementing risk response efforts. Therefore, steps to build a risk-aware culture must be an absolute requirement.

One of the limitations in this study is the absence of measurement of the effectiveness of the implementation of the proposed KRI system. Further studies in this area can be conducted by looking at the impact of KRI implementation on increasing

corporate risk culture awareness, which ultimately increases performance and corporate value.

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REFERENCES

Baker, L., & Sobel, P. (2016). Integrating key risk and performance indicators. *Internal Auditor*, *June*.

Baxter, P., & Jack, S. (2015). Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2008.1573

Beasley, M. S., Branson, B. C., Hancock, B. V, & Landes, C. (2010a). Developing key risk indicators to strengthen enterprise risk management. *How Key Risk Indicator Can Sharpen Focus on Emerging Risks*.

Beasley, M. S., Branson, B. C., Hancock, B. V, & Landes, C. (2010b). Developing key risk indicators to strengthen enterprise risk management: How Key Risk Indicators can Sharpen Focus on Emerging Risks. *Thought Leadershipin ERM, COSO (Committee of Sponsoring Organizations of the Treadway Commission), ERM Initiative at North Carolina State University*.

Beasley, M. S., Branson, B. C., Hancock, B. V, & Landes, C. (2010c). How key risk indicator can sharpen focus on emerging risks. *Committee Of Sponsoring Organizations Of The Treadway Commission*.

Boateng, A., Ameyaw, C., & Mensah, S. (2022). Assessment of systematic risk management practices on building construction projects in Ghana. *International Journal of Construction Management*, *22*(16). https://doi.org/10.1080/15623599.2020.1842962

Bondarenko, S., Shlafman, N., Kuprina, N., Kalaman, O., Moravska, O., & Tsurkan, N. (2021). Planning, accounting and control as risk management tools for small business investment projects. *Emerging Science Journal*, *5*(5). https://doi.org/10.28991/esj-2021-01302

de Vries, K. (2020). Case study methodology. In *Critical Qualitative Health Research: Exploring Philosophies, Politics and Practices*. https://doi.org/10.4324/9780429432774-2

Guertler, B., & Spinler, S. (2015). Supply risk interrelationships and the derivation of key supply risk indicators. *Technological Forecasting and Social Change*, *92*. https://doi.org/10.1016/j.techfore.2014.09.004

Hager, D., & Vormeland, H. B. (2016). Causal analysis of operational risk for deriving effective key risk indicators. In *Journal of Risk Management in Financial Institutions* (Vol. 9).

Hong, Y. R., & Kim, D. (2015). Measuring it security risk based on key risk indicator. *ICIC Express Letters, Part B: Applications*, *6*(3).

Jiménez-Rodríguez, E., Feria-Domínguez, J. M., & Sebastián-Lacave, A. (2018). Assessing the health-care risk: The clinical-var, a key indicator for sound management. *International Journal of Environmental Research and Public Health*, *15*(4). https://doi.org/10.3390/ijerph15040639

Kazbekova, K., Adambekova, A., Baimukhanova, S., Kenges, G., & Bokhaev, D. (2020). Bank risk management in the conditions of financial system instability. *Entrepreneurship and Sustainability Issues*, *7*(4). https://doi.org/10.9770/jesi.2020.7.4(46)

Liu, B. (2023). A Preliminary Study on the Construction of Enterprise Key Risk Indicator System. *Frontiers in Business, Economics and Management*, *7*(1). https://doi.org/10.54097/fbem.v7i1.4168

Mouatassim, H., & Ibenrissoul, A. (2015). Proposal for an Implementation Methodology of Key Risk Indicators System: Case of Investment Management Process in Moroccan Asset Management Company. *Journal of*

Financial Risk Management, *04*(03). https://doi.org/10.4236/jfrm.2015.43015

Ni'mah, F. (2022). Kontribusi Ekonomi dan Keuangan Syariah Dalam Pemulihan Ekonomi Pasca Pandemi. *Jurnal Ekonomi, Bisnis, Dan Manajemen Jingji*, *1*(1).

Nugraha, M., & Aini, N. (2022). Strategi Mitigasi Risiko Terhadap Aset Keuangan dan Fisik Koperasi Melalui Penerapan Key Risk Indicators. *AJIE*. https://doi.org/10.20885/ajie.vol6.iss2.art4

Prewett, K., & Terry, A. (2018). COSO's Updated Enterprise Risk Management Framework—A Quest For Depth And Clarity. *Journal of Corporate Accounting and Finance*, *29*(3). https://doi.org/10.1002/jcaf.22346

Rodríguez-Rivero, R., Ortiz-Marcos, I., Romero, J., & Ballesteros-Sánchez, L. (2020). Finding the links between risk management and project success: Evidence from international development projects in colombia. *Sustainability (Switzerland)*, *12*(21). https://doi.org/10.3390/su1221929

Scandizzo, S. (2005). Risk mapping and Key Risk Indicators in Operational Risk management. *Economic Notes*, *34*(2). https://doi.org/10.1111/j.0391-5026.2005.00150.x

Scarlat, E., Chirita, N., & Bradea, I. A. (2012). Indicators and metrics used in the enterprise risk management (ERM). *Economic Computation and Economic Cybernetics Studies and Research*, *4*.

Sianitawati, S., & Prasetyo, A. H. (2022). Rancangan Manajemen Risiko Korporat Terintegrasi Pada Perusahaan Pertambangan Batu Bara Tahun 2023-2024. *Jurnalku*, *2*(4). https://doi.org/10.54957/jurnalku.v2i4.302

Silvério, J., & Pestana, G. F. (2022). Integrated Risk Monitoring in the Quality Management System. *Lecture Notes in Networks and Systems*, *470 LNNS*. https://doi.org/10.1007/978-3-031-04829-6_1

Skorobogatova, Y. A., Bovkun, A. S., Lebedeva, T. A., & Arkhipkin, O. V. (2021). Analysis of approaches and principles to the formation of key risk indicators in construction. *IOP Conference Series: Earth and Environmental Science*, *751*(1). https://doi.org/10.1088/1755-1315/751/1/012177

Strachnyi, K. (2015). Operational Risk: Key Risk Indicators (KRIs). *Workiva Inc.*

van den Brink, G. J., & Leipoldt, M. (2022). Key Risk Indicators reloaded. *Maandblad Voor Accountancy En Bedrijfseconomie*, *96*(5/6). https://doi.org/10.5117/mab.96.80730

Vikaliana, R. (2018). BIG DATA ON DIGITAL LOGISTICS IN SUPPLY CHAIN RISK PERSPECTIVE. *Jurnal Logistik Indonesia*, *2*(1). https://doi.org/10.31334/jli.v2i1.215

Young, J. (2012). The use of key risk indicators by banks as an operational risk management tool: A South African perspective. *Corporate Ownership and Control*, *9*(3 Continued 1). https://doi.org/10.22495/cocv9i3c1art2