KNOWLEDGE MANAGEMENT FOR QUALITY ASSURANCE INNOVATION IN THE OPERATIONS QUALITY ASSURANCE DIVISION OF BANK BAKTI KARYA PURNA

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Abstract

Bank Bakti Karya Purna was a pseudonym for a real bank in Indonesia. As the bank continued to expand, the operational function needs to enhance its capability to keep up. Accordingly, the Operations Quality Assurance division (Ops QA) was expected to innovate to redefine its role, whereby, in addition to its traditional role as Inspector, the organization has to assume two other roles of *Guardian* and *Preventive Control Agent*. This research was intended to assist Ops QA to meet management expectations. To overcome the knowledge and capability gaps discovered, this research proposed a knowledge management solution that provides actionable items within three knowledge management components of people, process, and technology to enable the innovation to achieve the Ops QA objectives.

Keywords: Banking, operations, quality assurance, knowledge management, innovation.

Introduction

Bank Bakti Karya Purna ("The Bank") was established 60 years ago in West Java, which initially provided services for savings and give loans only to the members. Not long ago, the Bank transformed to become a commercial bank providing financial services for retail and small businesses.

After 50 years in business, the Bank went public following the acquisition of more than 70% of its shares by a national investment company. The Bank expanded its focus to micro, small, and middle business sectors and continued to expand its services and network through the development of various businesses and programs namely funding business, mass market empowerment program, sharia banking, ATM network, mass-market digital mobile banking platform for unbanked communities to support financial inclusion program, foreign exchange license and digital banking in Indonesia. Its sharia banking later evolved into a subsidiary of its legal entity.

The Bank undertook transformation following its merger with another entity in 2019. Since then, the Bank officially started operations as a new bank from the merged businesses. The Bank became a bank with the capacity to provide more comprehensive banking services to a wider customer base, from the retail to corporate segments.

Operations Directorate in the Bank

Bank's operations have the vision statement to become a partner who is competent to support the performance and growth of the Bank's business through operational services excellence. The Bank's operations targets to support the business to achieve its objectives. In managing banking operations, The Bank's operations management focuses its effort on operational excellence in several important aspects namely service standard, optimization, control and compliance, quality, and innovation through the implementation of 3 (three) pillars strategy as follows:
1. Benefit from technology advancement for branchless services.
2. Service point optimization.
3. Efficient process and internal control betterment including resource optimization.

According to Bank's Annual Report (2020), as of the end of the year, the Bank's operations manage the Bank's vast distribution network comprising hundreds of branch offices ATM (Automated Teller Machine), and TCR (Teller Cash Recycle) in 9 (nine) regions. The branch offices reached Bank customers in almost every part of Indonesia, servicing customers from various lines of business such as pensioners and micro-business owners in the universal branch and affluent customers in the retail branch. Apart from the regular

banking branches and ATM/TCR channels, the Bank established hundreds of payment points, designed to provide limited services dedicated only to pensioners' fund payments. The Bank provides branchless service to the customer through contact center. As customer behavior shift towards digital, customer prefers to be served through calls, chat, and email rather than having to visit the branch office.

The Bank's operations systematically improve its operational efficacy and effectiveness through development programs that continuously seek to innovatively upgrade processes and supporting systems. One of the programs includes the implementation of the latest innovation in process transformation i.e., Robotic Process Automation (RPA) which help the bank improve its loan processing in terms of shorter turnaround-time and higher output.

Taking part in Bank's risk management implementation, the Bank's operations became one of the integral parts of the Bank's three lines of defense mechanism. Being first line of defense, the Bank's operations deployed rigorous efforts in operational process and procedural development, and quality assurance. The quality assurance function systematically conducts quality and compliance inspections to ensure correct functioning processes and procedural adherence.

Operations Quality Assurance (Ops QA) Division

Bank's Internal Report (2021) shows that Ops QA division in the Bank's operations is responsible to perform the first line of the defense control function to measure that operations, as a risk-taking-unit (RTU), has adequately mitigated its operational risk through inspections conducted on operational service and processes. As inspector, the Ops QA division performs the following roles and responsibilities:

1. Define QA inspection framework and procedure in compliance with bank-wide risk management policy.
2. Conducts QA inspection throughout operations directorate independently.
3. Ensure that rectification action has been planned accordingly for any control lapses.
4. Manage resources required to perform QA inspection effectively and efficiently.
5. Ops QA is adequately granted access to any data, information, and/or documents needed to perform the inspection.
6. Ops QA is responsible to ensure the quality of inspection procedures through the implementation of internal control tools such as RGM (Risk Grading Matrix), PRC (Process Risk Control), and Inspection Working Paper.

7. Socialization of QA procedure to all QA personnel in the Ops QA division.
8. Report QA inspection results to management and commissioner.

The inspection conducted by the Ops QA team is carried out by Ops QA Inspection Framework which divided QA inspection into 2 (two) main methods namely periodic review and continuous monitoring.

Periodic Review

Branch QA inspection is conducted periodically, typically once in every quarter for each branch except for certain branches which fall into the lower risk category based on macro risk assessment. In the periodic review method, before conducting the inspection, Ops QA performs 2 (two) types of assessment, namely Macro Risk Assessment (MaRA) and Micro Risk Assessment (MIRA). MaRA intends to classify branch offices into 3 (three) risk categories of the high, medium, and low-risk branches. Several risk factors are used in MaRA to define branch risk categories, among others:

1. Previous QA or audit rating.
2. Loss event.
3. Number of transactions.
4. Funding growth.
5. Loan growth.

Branches that fall into the high-risk category will be inspected 4 (four) times within a year, while moderate and low-risk categories respectively 3 (three) and 2 (two) times in the same period.

In Micro Risk Assessment (MIRA), Ops QA applies data analytics capability to select the samples for inspection. The sample is not randomly selected but is systematically targeted through data analytics based on patterns found in historical data or experience. For instance, instead of selecting a transaction sample based on a random date, Ops QA uses specific anomaly criteria, i.e., transactions by the same customer which happened more than one or two times in a day, or transactions that happened after branch office hours. This way, Ops QA could focus more on events that have higher non-compliance probability and higher risk impact.

In periodic review, Ops QA performs inspection in 2 (two) different methods, namely onsite review and offsite review. During onsite review, the Ops QA officer visits the branch to inspect such areas as cash and vault management, inventory management, clean desk, and facilities management, including anomalies check through CCTV play-back review at the branch.

On the other hand, an inspection of various processing areas namely, transaction processing, account opening, reconciliation, loan processing, customer data maintenance, collateral management, and others are conducted off-site from the branch.

Continuous Monitoring

In addition to regular inspection as specified in the periodic review, Ops QA also performs continuous monitoring in the form of surveillance activity. A dedicated team in the head office will perform surveillance on anomalous transaction samples provided by Micro Risk Assessment. The customer will be contacted to verify the validity of the anomalous transaction. This way, violations or fraudulent attempts could be identified as early as possible. Any discrepancies found by the surveillance team during the customer phone interview shall be escalated to the QA officer who will visit the customer physically to clarify and obtain the customer statement.

Any fraud indication found from both periodic review and continuous monitoring shall be reported to the anti-fraud management unit for further investigation. The figure below depicts the Ops QA inspection framework:
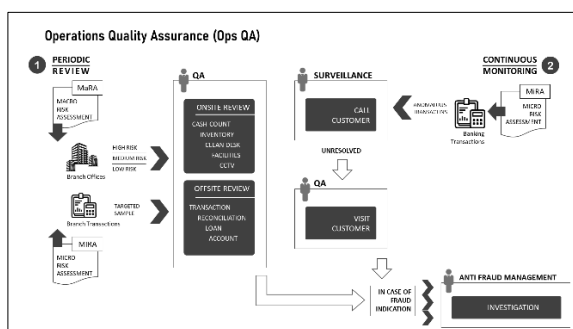

Figure 1. Ops QA inspection framework

Business Issues

Management Expectations

As the Bank continues to grow in terms of product offerings and customer segments, complexity and demand arise for the operations directorate to equip itself with enhanced capability, adaptability as well as excellence, in almost, if not all of its functions. In terms of the operation's quality assurance aspect, the management expects the Ops QA division to become next generation Ops QA which contributes more to guiding operational functions to upgrade their efficiency and effectiveness, while at the same time enhancing internal control capability. In addition to its current role as a quality inspector, Ops QA is required to extend its role to become guardian and preventive control agent.

Ops QA as Guardian

Ops QA is supposed to assist, provide advice and consult the operational functions to help them improve. Typically, the enormous workload faced by operational functions during their day-to-day operations hinders their ability to analyze and find opportunities for improvements. At times, these functions spend most of their remaining time dealing with constraints and challenges on hand. Ops QA should be able to understand the operational process and system thoroughly, analyze the situation and circumstances and find ways to help the unit improve.

Ops QA as Preventive Control Agent

Findings from Ops QA inspection have always been followed up with action plans. The operational functions make sure that the corrective action plan is executed promptly to close the findings. However, in many situations, corrective action is good enough only to remediate current lapses but is ineffective to prevent future occurrences from happening. The Ops QA should be able to perform cross-analysis of the findings data within multiple operational functions or branches to identify the underlying root cause which will, in turn, provide information or knowledge on whether a certain fundamental change to the process is required for preventive measures.

Current Condition and Identified Gaps

The Ops QA is currently performing its quality inspection role based on a predefined inspection checklist. Ops QA organization is structured based on its working territory covering areas, regions, and head office. Ops QA officers conduct inspections within the boundary of the inspection checklist. Findings are communicated, discussed, and finalized with corrective action plans with respective operational units at the branch, area, region, and head office.

The current arrangement enables Ops QA to focus itself on delivering optimum inspection activity while maintaining its independence. However, it doesn't support the Ops QA division to perform the roles of guardian and preventive control agent as expected by the management due to the following reasons:

1. Ops QA is designed to fully comply with existing procedures and inspection checklists with limited regard to process knowledge and opportunity for improvement.
2. Ops QA currently works and focuses on fulfilling inspection targets in its respective working territory and hardly ever collaborates across areas, regions, or head office.

3. Ops QA has never conducted further analysis on consolidated findings, and hence cannot find the root cause of control weakness and control improvement.

To be able to perform the additional roles of guardian and preventive control agent, the Ops QA division needs to overcome the following preliminary identified gaps:

1. Knowledge in Ops QA, created from inspection activities or learnings needs to be captured in a structured database to enable further learning and utilization for improvement and innovation.
2. Sharing of knowledge needs to happen within Ops QA, across different operational areas, regions, or head office to leverage learning and best practices and refine knowledge assets in Ops QA.
3. Ops QA needs to have a thorough understanding of operational processes and circumstances including the ability to conduct situational analysis to identify improvement opportunities. Ops QA also needs data analysis competencies to identify a pattern and further link it with other data, for instance, incidents or near-miss data to find any correlation or to build enough understanding of the matter to find the underlying problem and provide prescriptive analysis for preventive control.

Based on the preliminarily identified gaps, the Ops QA division could use knowledge management to improve its capability and innovate the new work processes needed to become the next generation Ops QA to meet management expectations. The following diagram summarizes the objectives and gaps in the Ops QA organization:
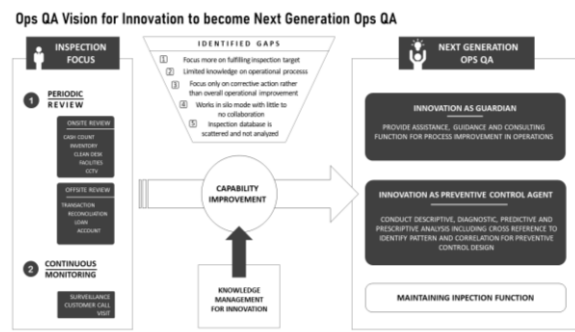

Figure 2. Improvements needed for Ops QA innovation

This research was conducted to assist the Ops QA organization to achieve its innovation objectives. Knowledge management disciplines were used as the basis to find the solution to bridge the identified capability gaps. This research also tries to find the current state of knowledge management capability in the Ops QA organization, including its gap.

Knowledge management is generally viewed and agreed to have a significant impact and directly contribute to organizational capability for innovation. Thus, this research also intended to provide insights on the application of knowledge management in a real organization to enable capability shifts to achieve its innovation objectives.

Knowledge Management

Organizational capabilities have long been identified as the result of an organization's ability to take full advantage of the knowledge and manage its knowledge resources to build its competitive position. Drucker (1999) pointed out that knowledge resources create a competitive advantage and bring benefits to the organization.

The knowledge that collectively resides in an organization and the minds of its employees and stakeholders has been argued as the key resource for the organization to build sustainable competitive advantage, as long as the knowledge is managed and used to leverage its core competencies, improve its processes, strengthen decision-making process, speed up time-to-market, including to accelerate innovation.

According to Carneiro (2000), knowledge management strategically encourages knowledge development which influences an organization's innovation and competitiveness. Successful knowledge management assists knowledge creation, provides means for effective knowledge flow, access, and sharing as well as facilitates collaboration, all of which played important roles in the organization's innovation process. In addition, Du Plessis (2007) pointed out that knowledge management aid the innovation process as knowledge management assists identification of knowledge base gaps and provides the process to bridge the gaps and build the required competencies.

Knowledge Management Framework

In the knowledge-driven enterprise, knowledge management is built on the learning organization which took shape from the foundation of trust, organizational culture, and learning disciplines. Learning organization entails nurturing the culture of openness and trust and learning disciplines within the organization. Leadership enables the building of human capital through the learning skills and work competence of knowledge workers, facilitated by a learning management system and other learning methods. Learning organization becomes the basis on which organizations or firms embark on knowledge management initiatives through a framework involving the people, process, and technology to enable methods and processes supported by technology tools to manage knowledge in

terms of creation or acquisition, sharing, storing, and usage or application to build competency to achieve enterprise objectives. With such disciplines in place, the firm becomes an organization with the capability to optimize and leverage knowledge for value creation or innovation which will, in turn, determine its competitive position.

The knowledge management framework proposed by Tjakraatmadja and Kristinawati (2017) as Jann Model shows how knowledge management supports premium value creation or innovation as depicted in the figure below:
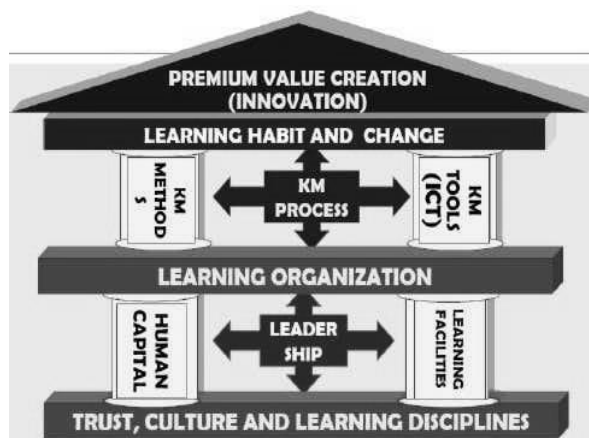

Figure 3. Jann Model of KM framework

Research Methods

This research uses a quantitative approach to study the situation in the Ops QA based on a knowledge management approach. The research data is collected using a structured questionnaire conducted to provide an understanding of the current knowledge management capability in the Ops QA division. Subsequently, further analysis will be carried out using a knowledge management framework to review the current situation gaps against the objectives of innovation for next generation Ops QA. In conclusion, the research will design the knowledge management solution to address the situation in Ops QA to help achieve the intended innovation.

Research Data

Research data is obtained from a questionnaire in the Ops QA division, designed as follows:
1. Questionnaire Design
    a. Questions used are derived from the American Productivity and Quality Center's (APQC, 2011) knowledge management capability assessment which assesses KM capabilities in terms of strategy, people, process, and content management & IT as shown in Table 1.

Table 1
Questions Used

Area	Component	Code	Question
Strategy	Objectives	ST01	The needs and awareness of knowledge management start to emerge in the organization.
Strategy	Objectives	ST02	Knowledge has been identified and documented including the use of knowledge to create value
Strategy	Objectives	ST03	Knowledge management strategy and road map are documented, including the re-use of knowledge
Strategy	Objectives	ST04	Knowledge management competencies and infrastructure are enhanced to meet increased demand as well as leveraging knowledge assets for competitive advantage
Strategy	Objectives	ST05	Innovation is aligned with the organization excellence framework which includes knowledge management
Strategy	Business Case	ST06	Ops QA has started to use knowledge
Strategy	Business Case	ST07	The area of focus of knowledge management is clear and has been aligned with strategies
Strategy	Business Case	ST08	The value of knowledge management investment is analyzed and benefits are documented
Strategy	Business Case	ST09	Knowledge management expansion is planned by gains and impacts predicted
Strategy	Business Case	ST10	Use of knowledge management to create value through collaboration
Strategy	Budget	ST11	Knowledge management projects in Ops QA started with specific and small scale
Strategy	Budget	ST12	Functions other than Ops QA also implement and fund knowledge management
Strategy	Budget	ST13	Knowledge management expansion has been budgeted
Strategy	Budget	ST14	The budgeting process includes knowledge management
Strategy	Budget	ST15	An increase in knowledge assets and competencies is backed by a higher budget
People	Human Capital	PE01	Pioneers start to convince business leaders of knowledge management.
People	Human Capital	PE02	Knowledge management strategy and approach are designed by the knowledge management group.
People	Human Capital	PE03	The organization has a knowledge management sponsor and champion.
People	Human Capital	PE04	The knowledge management group works on knowledge asset development to support core competencies. Knowledge management skills are part of employee development.
People	Human Capital	PE05	Capability in knowledge management is expanded within the organization.
People	Governance & Leadership	PE06	Test implementation for knowledge management is approved by leaders.

Area	Component	Code	Question
People	Governance & Leadership	PE07	Knowledge management direction is set by a group consisting of people from different functions.
People	Governance & Leadership	PE09	Knowledge management is supported by resources and clear accountabilities.
People	Governance & Leadership	PE10	Organization leaders own and guide knowledge management.
People	Change Management	PE13	Employees of all levels can access knowledge management training.
People	Change Management	PE14	Efforts of knowledge management are recognized including success and lessons learned.
People	Change Management	PE15	Process improvement, talent management, learnings in the organization as well as leadership development is aligned with knowledge management.
People	Communi-cation	PE11	Pioneers of knowledge management start to share the benefit and concept of KM.
People	Communi-cation	PE12	Knowledge management has been formally and widely communicated in Ops QA including to senior leaders.
People	Communi-cation	PE13	Knowledge management awareness is improved by a formal communication plan.
People	Communi-cation	PE14	Knowledge management approaches that bring good impact to business result is well communicated.
People	Communi-cation	PE15	Acquisition of new customers or recruitment of new employees is backed by knowledge management strategy and efforts.
Process	Knowledge Flow	PR01	The flow of knowledge happens on an individual level.
Process	Knowledge Flow	PR02	Processes for knowledge flow exist and are stable in Ops QA.
Process	Knowledge Flow	PR03	Processes for knowledge flow are widely used in other functions as well.
Process	Knowledge Flow	PR04	Organizational processes and functions include the knowledge flow process.
Process	Knowledge Flow	PR05	Expansion of knowledge flow across different functions.
Process	KM Approaches	PR06	Transfer of knowledge happened on an individual level.
Process	KM Approaches	PR07	Opportunity for knowledge flow enhancement based on Ops QA main process has been identified.
Process	KM Approaches	PR08	The knowledge center has been implemented in Ops QA.
Process	KM Approaches	PR09	Knowledge management approach and method are improved along with knowledge flow and competency.
Process	KM Approaches	PR10	Process improvement makes use of a knowledge management approach and methods including organizational development.
Process	Measurement	PR11	Ops QA starts to assess and identify critical knowledge in the organization.
Process	Measurement	PR12	Ops QA measures the impact, activity, cost, and benefit of knowledge management early implementation.
Process	Measurement	PR13	Knowledge management activity is measured in line with business output measurement. The benefit of knowledge management is monitored incl investment and satisfaction.
Process	Measurement	PR14	Knowledge management effort gives a measured business impact and is properly reported with evidence of improving knowledge management capabilities and effectiveness.
Process	Measurement	PR15	Performance outcome is tracked in integration with knowledge management measurements.
CM & IT	Content Management	CI01	Ops QA already has a document management.
CM & IT	Content Management	CI02	Knowledge and content in Ops QA have been organized.
CM & IT	Content Management	CI03	Knowledge assets are classified based on standard taxonomies.
CM & IT	Content Management	CI04	Ability to manage content exists and is continuously improved in line with the new user approach.
CM & IT	Content Management	CI05	Knowledge development and innovation are reflected in the content management process that is supported by an information system that enables collaboration and real-time collective decision-making.
CM & IT	Information Technology	CI06	Ops QA uses IT and application tool.
CM & IT	Information Technology	CI07	The IT supports the implementation of knowledge management tools designed by a group of people responsible for knowledge management.
CM & IT	Information Technology	CI08	The knowledge management application is standard and has become an integral part of an overall IT strategy.
CM & IT	Information Technology	CI09	Proper tools exist for the ability to search and discover information or content from multiple locations or repositories.
CM & IT	Information Technology	CI10	Knowledge can be shared with external partners through IT system access.

b. The questionnaire is structured to allow only limited responses using five points Likert scale in which respondents are instructed to provide their opinion within options of "agree", "partially agree", "neutral", "partially disagree", and "disagree".

2. Respondent Selection
Respondents for the questionnaire should have sufficient working experience and knowledge of the organization. The respondent is selected from the employee within the Ops QA division that satisfies the following criteria:

a. Employees with a length of work of at least 1 year.

b. Employees from all levels in the division, starting from QA officer up to QA head.

c. Employees from all geographic locations.

Based on the above criteria, 68 respondents are selected.

3. Reliability and Validity Test

Before the survey, the questionnaire was tested for reliability and validity as follows:

   a. Number of samples: 20

   b. Test was conducted using a Microsoft Excel spreadsheet

   c. Reliability Test

   The reliability of the questionnaire was conducted using Cronbach's Alpha which measures the test's internal consistency by a number between 0 and 1. An Alpha value higher than 0.9 is considered excellent, while a value between 0.7 to 0.9 is deemed as good, 0.6 to 0.7 as acceptable, and above 0.6 is considered reliable (Streiner, 2003). The reliability test on 20 (twenty) samples was calculated using an MS Excel spreadsheet.

   d. Validity Test

   In terms of validity, the questionnaire was tested using Pearson's product moment correlation coefficient. The correlation coefficient of the data was calculated using a Microsoft Excel spreadsheet. The calculation result was compared with the r value of 0.444. This value represents the *r* for the degree of freedom of 18 (two less from the number of samples) and a level of significance of 5% (0.05). If the correlation coefficient result is greater than the *r-value* from the table, i.e., 0.444, the questions are considered valid.

   e. Test result

   The reliability test result shows an alpha value of greater than 0.9 for strategy and process capability areas and an alpha value of greater than 0.8 for people and content management and IT capability, indicating that the test can be considered reliable.

   The validity test results show that all 60 (sixty) questions within 4 (four) capability areas are found valid.

The following tables describe the result of the reliability and validity test on the questionnaire:

Table 2
Reliability and Validity Test Result

Capa bility	Al pha	Compo nent	Ques tion	Correla tion Coeffi cient	*r- table* (18: 0.05%)
Strategy	0.95	Objectives	ST01	0.765	0.444
			ST02	0.939	0.444
			ST03	0.919	0.444
			ST04	0.849	0.444
			ST05	0.896	0.444
		Business Case	ST06	0.918	0.444
			ST07	0.931	0.444
			ST08	0.908	0.444
			ST09	0.870	0.444
			ST10	0.839	0.444
			ST11	0.610	0.444
			ST12	0.947	0.444
		Budget	ST13	0.947	0.444
			ST14	0.958	0.444
			ST15	0.960	0.444
People	0.81	Human Capital	PE01	0.706	0.444
			PE02	0.743	0.444
			PE03	0.837	0.444
			PE04	0.792	0.444
			PE05	0.842	0.444
			PE06	0.641	0.444
		Gover- nance & Leadership	PE07	0.778	0.444
			PE08	0.835	0.444
			PE09	0.657	0.444
			PE10	0.720	0.444
			PE11	0.578	0.444
		Change Manage- ment	PE12	0.812	0.444
			PE13	0.877	0.444
			PE14	0.874	0.444
			PE15	0.806	0.444
			PE16	0.615	0.444
		Communi- cation	PE17	0.815	0.444
			PE18	0.834	0.444
			PE19	0.884	0.444
			PE20	0.810	0.444
Process	0.93	Knowledge Flow	PR01	0.895	0.444
			PR02	0.867	0.444
			PR03	0.927	0.444
			PR04	0.814	0.444
			PR05	0.864	0.444
			PR06	0.871	0.444
		KM Appro- aches	PR07	0.868	0.444
			PR08	0.836	0.444
			PR09	0.671	0.444
			PR10	0.624	0.444
			PR11	0.691	0.444
		Measure- ment	PR12	0.895	0.444
			PR13	0.678	0.444
			PR14	0.613	0.444
			PR15	0.701	0.444
CM & IT	0.89	Content Manage- ment	CI01	0.681	0.444
			CI02	0.869	0.444
			CI03	0.889	0.444
			CI04	0.855	0.444
			CI05	0.880	0.444
			CI06	0.880	0.444
		Information Techno logy	CI07	0.868	0.444
			CI08	0.835	0.444
			CI09	0.769	0.444
			CI10	0.759	0.444

4. Research Process and Duration

The research was conducted within four months (March 2022 – June 2022) in the following process:
a. Questionnaire design and sample: 1 month
b. Reliability and validity test: 2 weeks
c. Data collection (questionnaire): 2 weeks
d. Analysis and design: 2 months

5. Research Data Processing

Data from the questionnaire (survey) is processed using a Microsoft Excel spreadsheet.

Results and Discussion

Respondent Demography

There are 68 respondents from the Ops QA organization who participated in the survey with the following demography:

1. Gender

The gender composition of the respondents is almost equal at:
a. 35 male respondents (51%)
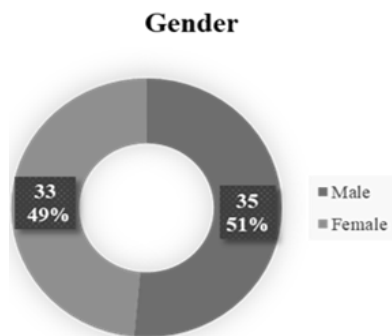b. 33 female respondents (49%)

Figure 4. Respondent's gender

2. Length of work

Most of the respondents have worked at the Ops QA organization for more than three years with the overall composition as follows:
a. Up to 3 years: 19 (28%)
b. 3 to 6 years: 28 (41%)
c. 6 to 9 years: 7 (10%)
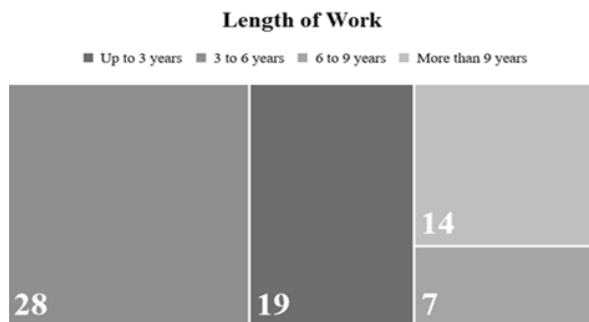d. More than 9 years: 14 (21%)

Figure 5. Respondent's length of work

3. Position

More than half of the respondents are QA officers, with the overall composition as follows:
a. QA Officer: 43 (63%)
b. Area QA Manager: 19 (28%)
c. Region QA Leader: 3 (4.5%)
d. QA Manager: 2 (3%)
e. QA Head: 1 (1.5%)

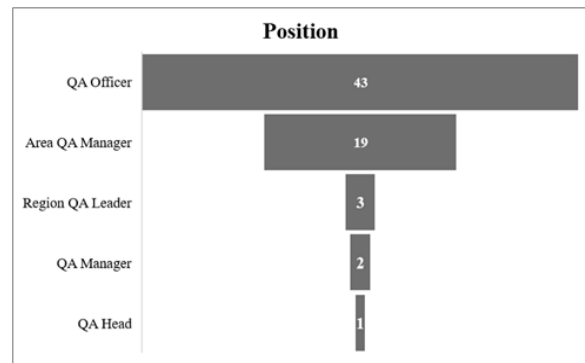**Figure 6. Respondent's position**

Knowledge Management Capability in Ops QA

The questionnaire or survey results of four knowledge management capability areas in Ops QA show a total average of 2.49 out of 5. The Strategy capability has the lowest average score of 2.09, followed by 2.55 in People capability, and 2.65 in Content Management and IT capability. The highest average score of 2.69 is achieved in Process capability.
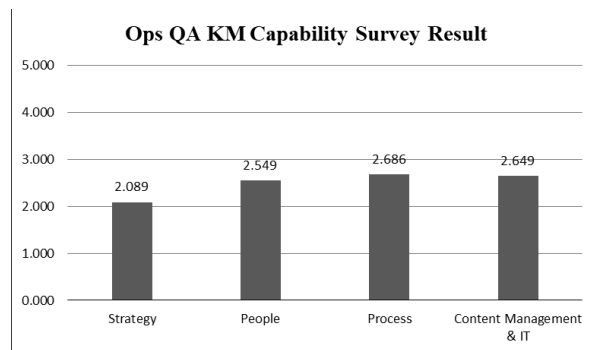

Figure 7. KM capability survey result

Strategy Capability

With an average score of 2.09, the survey result shows that Ops QA has the lowest capability in strategy compared to the other three capability areas. The strategy capability area consists of three components with five questions each, namely objectives, business case, and budget. the test result indicates that in terms of objectives, business cases, and budget, Ops QA is currently in the early stage of knowledge management implementation, whereby awareness of knowledge

management has just started to take place. Objectives for KM are neither well documented nor aligned with its goals, knowledge processes have not become a marketable asset, and funding for knowledge management is still very specific to a situation or project-based. The following table and figure show details of the response and average of each question in the three components:

Table 3
Strategy Capability Survey Result

| Code	Agree (5)	Partially Agree (4)	Neutral (3)	Partially Disagree (2)	Disagree (1)	Σ	Avg
ST01	54 (79%)	12 (18%)	0 (0%)	1 (1%)	1 (1%)	68	4.721
ST02	2 (3%)	5 (7%)	0 (0%)	30 (44%)	31 (46%)	68	1.779
ST03	0 (0%)	5 (7%)	0 (0%)	29 (43%)	34 (50%)	68	1.647
ST04	0 (0%)	3 (4%)	0 (0%)	17 (25%)	48 (71%)	68	1.382
ST05	1 (1%)	2 (3%)	1 (1%)	11 (16%)	53 (78%)	68	1.338
ST06	16 (24%)	14 (21%)	0 (0%)	12 (18%)	26 (38%)	68	2.735
ST07	1 (1%)	3 (4%)	1 (1%)	15 (22%)	48 (71%)	68	1.441
ST08	0 (0%)	1 (1%)	2 (3%)	14 (21%)	51 (75%)	68	1.309
ST09	1 (1%)	0 (0%)	2 (3%)	15 (22%)	50 (74%)	68	1.338
ST10	0 (0%)	0 (0%)	1 (1%)	13 (19%)	54 (79%)	68	1.221
ST11	53 (78%)	14 (21%)	0 (0%)	0 (0%)	1 (1%)	68	4.735
ST12	4 (6%)	8 (12%)	2 (3%)	40 (59%)	14 (21%)	68	2.235
ST13	6 (9%)	3 (4%)	2 (3%)	42 (62%)	15 (22%)	68	2.162
ST14	2 (3%)	4 (6%)	2 (3%)	15 (22%)	45 (66%)	68	1.574
ST15	3 (4%)	6 (9%)	2 (3%)	15 (22%)	42 (62%)	68	1.721
					Strategy Capability Average		2.089
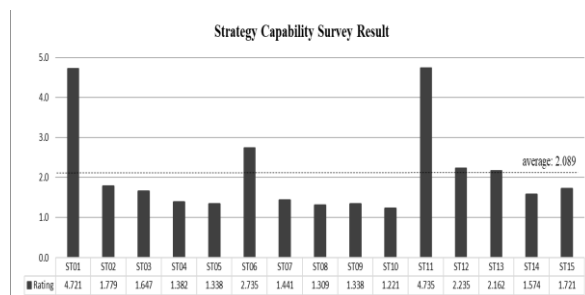
Figure 8. Strategy capability survey result chart

The questions which score below average suggest that Ops QA lacks knowledge management strategy in the following capabilities:

1. Knowledge has been identified and documented including the use of knowledge to create value.
2. Knowledge management strategy and road map are documented, including the re-use of knowledge.
3. Knowledge management competencies and infrastructure are enhanced to meet increased demand as well as leverage knowledge assets for competitive advantage.
4. Innovation is aligned with the organization excellence framework which includes knowledge management.
5. The area of focus of knowledge management is clear and has been aligned with strategies.
6. The value of knowledge management investment is analyzed and benefits are documented.

7. Knowledge management expansion is planned by gains and impacts predicted.
8. Use of knowledge management to create value through collaboration.
9. The budgeting process includes knowledge management.
10. An increase in knowledge assets and competencies is backed by a higher budget.

People Capability

The survey result for the people capability area shows an average score of 2.55. This area comprises four components of human capital, governance leadership, change management, and communication. The overall average score indicates that Ops QA has low capability in the people area. In terms of human capital, Ops QA has not achieved the objectives of having both KM aligned with core competencies, as well as employee involvement in KM as part of their job responsibilities and professional development. Ops QA lacks senior leadership sponsorship and alignment at the highest level for knowledge management governance and leadership. For change management, knowledge management activities have not been aligned and integrated with Ops QA's existing improvement programs as well as human capital management strategies. And lastly, in terms of communication, Ops QA has neither defined KM "brands" nor uses them consciously to drive communication with employees, job candidates, and other parties.

The Table 4 and Figure 9 show details of the response and average of each question in the four components:

Table 4
People Capability Survey Result

Code	Agree (5)	Partially Agree (4)	Neutral (3)	Partially Disagree (2)	Disagree (1)	Σ	Avg
PE01	44 (65%)	14 (21%)	0 (0%)	4 (6%)	6 (9%)	68	4.265
PE02	3 (4%)	8 (12%)	1 (1%)	38 (56%)	18 (26%)	68	2.118
PE03	4 (6%)	4 (6%)	1 (1%)	37 (54%)	22 (32%)	68	1.985
PE04	0 (0%)	4 (6%)	1 (1%)	18 (26%)	45 (66%)	68	1.471
PE05	1 (1%)	4 (6%)	0 (0%)	17 (25%)	46 (68%)	68	1.485
PE06	60 (88%)	5 (7%)	0 (0%)	2 (3%)	1 (1%)	68	4.779
PE07	2 (3%)	12 (18%)	1 (1%)	38 (56%)	15 (22%)	68	2.235
PE08	1 (1%)	6 (9%)	1 (1%)	39 (57%)	21 (31%)	68	1.926
PE09	3 (4%)	8 (12%)	1 (1%)	13 (19%)	43 (63%)	68	1.750
PE10	3 (4%)	8 (12%)	1 (1%)	14 (21%)	42 (62%)	68	1.765
PE11	58 (78%)	7 (21%)	0 (0%)	3 (0%)	1 (1%)	68	4.765
PE12	8 (6%)	46 (12%)	0 (3%)	8 (59%)	15 (21%)	68	3.618
PE13	1 (9%)	7 (4%)	0 (3%)	37 (62%)	21 (22%)	68	1.912
PE14	7 (3%)	9 (6%)	0 (3%)	15 (22%)	43 (66%)	68	2.029
PE15	1 (4%)	3 (9%)	0 (3%)	22 (22%)	42 (62%)	68	1.515
PE16	51 (75%)	15 (22%)	0 (0%)	2 (3%)	0 (02%)	68	4.691
PE17	3 (4%)	47 (69%)	2 (3%)	10 (15%)	6 (9%)	68	3.456
PE18	0 (0%)	4 (6%)	1 (1%)	35 (51%)	28 (41%)	68	1.721
PE19	7 (10%)	11 (16%)	1 (1%)	10 (15%)	39 (57%)	68	2.074
PE20	2 (3%)	2 (3%)	1 (1%)	12 (18%)	51 (75%)	68	1.412
					People Capability Average		2.549

The questions which score below average suggest that Ops QA lacks in knowledge management people aspect in the following capabilities:

1. Knowledge management strategy and approach are designed by the knowledge management group.
2. The organization has a knowledge management sponsor and champion.
3. The knowledge management group works on knowledge asset development to support core competencies. Knowledge management skills are part of employee development.
4. Capability in knowledge management is expanded within the organization.
5. Knowledge management direction is set by a group consisting of people from different functions.

Figure 9. People capability survey result chart

6. Organization strategy embeds knowledge management initiatives.
7. Knowledge management is supported by resources and clear accountabilities.
8. Organization leaders own and guide knowledge management.
9. Employees of all levels can access knowledge management training.
10. Efforts of knowledge management are recognized including success and lessons learned.
11. Process improvement, talent management, learnings in the organization as well as leadership development is aligned with knowledge management.
12. Knowledge management awareness is improved by a formal communication plan.

13. Knowledge management approaches that bring good impact to business result is well communicated.
14. Acquisition of new customers or recruitment of new employees is backed by knowledge management strategy and efforts.

Process Capability

The survey result for the process capability area shows an average score of 2.68. This area comprises three components of knowledge flow, approaches, and measurements. The overall average score indicates that Ops QA has low capability in the process capability area. In terms of knowledge flow, Ops QA has not achieved the objectives of having knowledge sharing as "the way work gets done." Knowledge sharing in Ops QA happened only at the individual level and has not become organizational culture. Knowledge flow supported by knowledge creation and capture, storage, communities of practice, after-action-review, lessons learned as well means to locate knowledge experts has not been established in Ops QA. The knowledge management resource center is currently not available and valuable knowledge is yet to be captured and used to support improvement and innovation. Ops QA needs to start knowledge management initiatives and pursue knowledge management to become an organizational core competency where the participation of all employees is mandatory. Ops QA organizations have not correlated knowledge management measures with HR and functional outcomes. There is no standard measurement for knowledge management aligned with process and output. Knowledge management impact is not monitored to ensure an organizational performance scorecard. The Table 5 and Figure 10 show details of the response and average of each question in the three components.
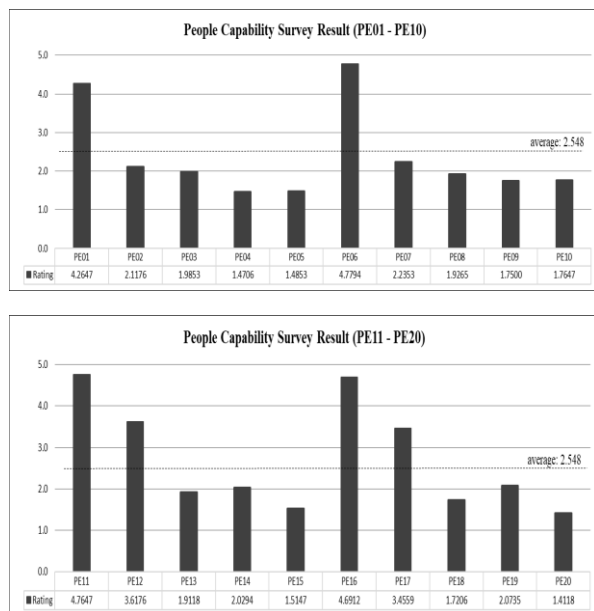
Table 5
Process Capability Survey Result

| Code | Response | | | | | $\sum$ | Avg |
	Agree (5)	Partially Agree (4)	Neutral (3)	Partially Disagree (2)	Disagree (1)		
PR01	27 (40%)	33 (49%)	0 (0%)	6 (9%)	2 (3%)	68	4.132
PR02	6 (9%)	34 (50%)	0 (0%)	14 (21%)	14 (21%)	68	3.059
PR03	2 (3%)	41 (60%)	0 (0%)	11 (16%)	14 (21%)	68	3.088
PR04	3 (4%)	14 (21%)	0 (0%)	39 (57%)	12 (18%)	68	2.368
PR05	0 (0%)	4 (6%)	1 (1%)	41 (60%)	22 (32%)	68	1.809
PR06	27 (40%)	10 (15%)	0 (0%)	29 (43%)	2 (3%)	68	3.456
PR07	5 (7%)	39 (57%)	0 (0%)	6 (9%)	18 (26%)	68	3.103
PR08	4 (6%)	28 (41%)	0 (0%)	15 (22%)	21 (31%)	68	2.691
PR09	3 (4%)	6 (9%)	1 (1%)	39 (57%)	19 (28%)	68	2.044
PR10	4 (6%)	1 (1%)	1 (1%)	39 (57%)	23 (34%)	68	1.882
PR11	63 (93%)	5 (7%)	0 (0%)	0 (0%)	0 (0%)	68	4.926
PR12	5 (7%)	36 (53%)	2 (3%)	8 (12%)	17 (25%)	68	3.059
PR13	1 (1%)	3 (4%)	0 (0%)	38 (56%)	26 (38%)	68	1.750
PR14	2 (3%)	4 (6%)	0 (0%)	13 (19%)	49 (72%)	68	1.485
PR15	2 (3%)	2 (3%)	2 (3%)	12 (18%)	50 (74%)	68	1.441
					Process Capability Average		**2.686**
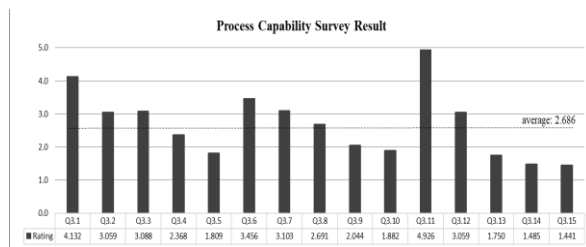
Figure 10. Process capability survey result chart

The questions which score below average suggest that Ops QA lacks in KM Process aspect in the following capabilities:
1. Organizational processes and functions include the knowledge flow process
2. Expansion of knowledge flow across different functions
3. Knowledge management approach and method are improved along with knowledge flow and competency.
4. Process improvement makes use of a knowledge management approach and methods including organizational development
5. Knowledge management activity is measured in line with business output measurement. The benefit of knowledge management is monitored including investment and satisfaction.
6. Knowledge management effort gives a measured business impact and is properly reported along with evidence of improving knowledge management capabilities and effectiveness.
7. Performance outcome is tracked in integration with knowledge management measurements.

Content Management and Information Technology Capability

The survey result for content management and information capability area shows an average score of 2.64. This capability area comprises two components of the content management process and information technology. The overall average score indicates that Ops QA has low capability in content management and information technology capability areas. In terms of content management, Ops QA has not achieved the objectives of using content management processes to facilitate collaboration and uncover innovations occurring within the function. Core knowledge assets have not been classified in a standard taxonomy. No standard workflow is available to manage content, let alone be evaluated and enhanced. Knowledge systems are not available to support collaboration and collective decision-making. In terms of IT, Ops QA does not standardize the tools or applications for knowledge

management and is not part of the overall IT strategy. IT infrastructure for knowledge management expansion has not been assessed and evaluated for scalability and functionality. Ops QA is currently not supported by proper tools that provide the ability to search and discover information or content from multiple locations or repositories. Learning and process tools have yet to be leveraged to support knowledge management efforts. Knowledge capture systems are not available.

The Table 6 and Figure 11 show details of the response and average of each question in the two components.

Table 6
CM and IT Capability Survey Result

| Code	Agree (5)	Partially Agree (4)	Neutral (3)	Partially Disagree (2)	Disagree (1)	Σ	Avg
CI01	56 (82%)	10 (15%)	0 (0%)	1 (1%)	1 (1%)	68	4.750
CI02	9 (13%)	42 (62%)	0 (0%)	11 (16%)	6 (9%)	68	3.544
CI03	3 (4%)	9 (13%)	0 (0%)	37 (54%)	19 (28%)	68	2.118
CI04	4 (6%)	12 (18%)	0 (0%)	33 (49%)	19 (28%)	68	2.250
CI05	4 (6%)	8 (12%)	0 (0%)	12 (18%)	44 (65%)	68	1.765
CI06	44 (65%)	16 (24%)	0 (0%)	5 (7%)	3 (4%)	68	4.368
CI07	21 (31%)	19 (28%)	0 (0%)	6 (9%)	22 (32%)	68	3.162
CI08	1 (1%)	6 (9%)	0 (0%)	34 (50%)	27 (40%)	68	1.824
CI09	1 (1%)	4 (6%)	0 (0%)	13 (19%)	50 (74%)	68	1.426
CI10	0 (0%)	1 (1%)	1 (1%)	14 (21%)	52 (76%)	68	1.279
					CM & IT Capability Average		**2.649**
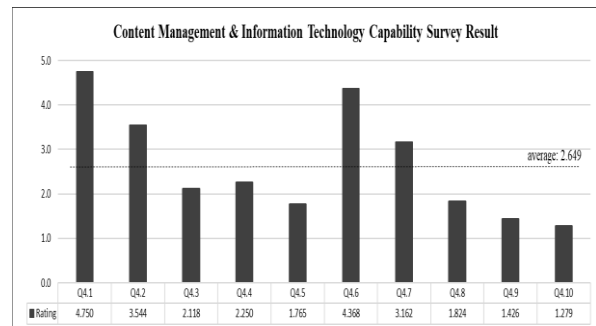
Figure 11. CM & IT capability survey result chart

The questions which score below average suggest that Ops QA lacks knowledge management content management and information technology aspect in the following capabilities:
1. Knowledge assets are classified based on standard taxonomies.
2. Ability to manage content exists and is continuously improved in line with the new user approach.
3. Knowledge development and innovation are reflected in the content management process that is supported by an information system that enables collaboration and real-time collective decision-making.

4. Knowledge management tools and repositories are integrated, allowing a single search and source for knowledge.
5. The knowledge management application is standard and has become an integral part of an overall IT strategy.
6. Proper tools exist for the ability to search and discover information or content from multiple locations or repositories.
7. Knowledge can be shared with external partners through IT system access.

Discussion

To develop a knowledge management strategy, the organization needs to first identify and understand where it is now, in other words, its "as-is" state compared to the state it wants to achieve, or the "to-be" state (Dalkir, 2005).

This research captured the current state of the Ops QA knowledge management capability through the knowledge management capability questionnaire derived from APQC's knowledge management capability assessment. The questionnaire result was further analyzed to identify the gaps within APQC's four knowledge management capability areas of strategy, people, process, and CM & IT.

Subsequently, this research focused on the analysis to find solutions to assist the organization to overcome its capability gaps to achieve its innovation objectives. The study conducted by Lam Nyguyen, Le, and Tran (2021) provides evidence showing that knowledge management and innovation capability have a significant relationship. This means, that to achieve the business objectives of innovation to become next generation Ops QA, the organization needs to embark on a knowledge management strategy. Furthermore, Shannak, Masa'deh, and Akour (2012), suggested that the knowledge management strategy should not cover only the high-level purpose or target, instead, it must have the needs and gaps identified and include an actionable detail framework to solve the issues.

This research conducted a step-by-step analysis to design an actionable knowledge management framework as a solution for innovation objectives in the Ops QA division. The process comprises six steps of analysis covering: (1) elaborate on the business objectives in detail to clearly understand the goals, (2) identify the challenges and needs to achieve the objectives, (3) plan the required actions to address the identified challenges, (4) classify the critical knowledge required in the actions, (5) define the knowledge management objectives based on the critical knowledge, and finally, (5) design the actionable knowledge management framework that covers people, processes, and technology aspects as a solution to achieve the objectives.

Identified KM Gaps in Ops QA

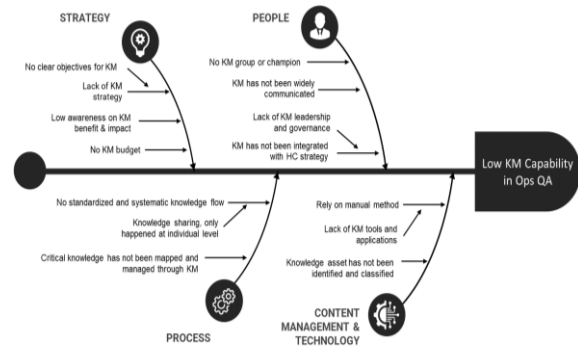The knowledge management gaps identified can be depicted in Figure 12.

Figure 12. Identified KM gaps in Ops QA

Strategy

Ops QA has neither aware of the knowledge management discipline nor the benefit and opportunities KM may bring. Under such circumstances, the organization cannot strategize KM appropriately with well-defined and clear objectives. Without the appropriate strategy and objectives tied to benefit and impact to the organization, the budget for KM could never be proposed and never been considered as part of organizational initiatives, let alone integrated into strategic planning and annual budgeting.

People

The way of working in which Ops QA currently operates does not encourage the culture needed for KM to succeed. The organization works mostly in silo mode, where each region seeks to achieve inspection targets within the defined framework and checklist with less knowledge of what happened at the other regions and the consolidated level, resulting in cases of:
1. The consolidated QA report has shown repeated top findings for more than three consecutive inspection periods.
2. Internal meeting conducted by head office with Ops QA region heads has more than 10 cases of difference in inspection approaches despite having a single inspection checklist reference.
3. Cross inspection by QA officers from different regions shows occurrences of a 15% difference in findings and two significant differences in inspection rating.

The cases mentioned above show that currently, Ops QA lacks the culture of knowledge sharing, as well as has different capabilities despite sharing the same reference and training. Some QA officers can think critically while others simply strictly follow the inspection checklist. Although Ops QA does not currently face the risk of knowledge loss due to employee turnover, as the turnover rate in Ops QA is relatively low at less than 5%, such a capability gap hinders Ops QA from delivering consistent results and facilitating control improvement in Operations.

There is no officer in Ops QA appointed as a champion to drive knowledge management. Awareness of knowledge management is lacking at almost every level of the organization as knowledge management has not been widely communicated. At this stage, Ops QA has just started to realize that the organization could benefit from knowledge management, hence neither knowledge management leadership and governance nor integration of knowledge management with human capital development strategy existed.

Process

Inspection activities in Ops QA have been governed through a formal operating procedure (SOP), standardizing the overall quality assurance planning, execution, communication, and reporting processes. Working paper for QA officers has also been standardized in spreadsheet format, providing steps of inspection which need to be followed throughout inspection activities. The inspection result is communicated and agreed upon with the auditee at the branch level and subsequently formalized into the branch inspection report. The inspection report will be collected and sent to the head office for consolidated reporting.

However, knowledge created during inspection activity has not been handled for purposes other than reporting, for example, to identify control breach patterns or even improvement opportunities. Experience and knowledge gained are normally kept within each QA officer. At best, knowledge sharing happened in an ad-hoc manner only at the individual QA officer level depending on a personal relationship or between the QA officer and its respective QA area manager during the finalization of the inspection report. Apart from report submission to head office, systematic horizontal knowledge flow across areas or regions hardly ever happens. In addition, Ops QA has never identified and mapped the critical knowledge it has and constantly produced, albeit having high exposure to information and knowledge during the inspection, nor has it shared and stored as well as made use of the knowledge for a higher purpose.

Content Management & IT

Activities throughout the Ops QA inspection process are carried out manually, mainly using documents, paper, or spreadsheets as a tool. Ops QA has not utilized technology to assist the overall process, for instance, govern the workflow, store inspection data, and information, mediate exchanges and facilitate data and information consolidation and analysis which will in turn create the knowledge. Inspection result is stored in a decentralized manner at the area and region level in an individual file, in both document and spreadsheet format. Without the appropriate tool, Ops QA spends a great deal of time at the area, region and head office level to gather, sort and consolidate information or knowledge gained from inspection. Such a condition leaves the organization with little capacity to identify and classify the knowledge asset it has created, denying the opportunity to improve the organization, develop its personnel or even invoke process innovation within.

Designing Knowledge Management Framework as Solution to Achieve the Innovation in Ops QA

Elaboration of Business Objectives

The growing complexity and demand for enhanced capability, adaptability, and operational excellence in operations require the Ops QA to contribute more to upgrading operational functions efficiency and effectiveness while enhancing internal control capability. Ops QA intends to meet the expectation through its vision of next generations Ops QA which move QA from procedure-oriented inspection to value-added quality assurance which entails the enhancement of Ops QA's role as follows:
A. Expand QA role as guardian to provide consultancy function in guiding and enabling improvement in operational function's efficiency and effectiveness.
B. Extend QA role as preventive control agent to provide analytical function in problem pattern recognition and root cause identification to drive preventive control measures.

Identification of Challenges and Needs

As previously discussed, the current Ops QA set-up dictates the team to perform a role within the boundary of existing procedures and inspection checklists. This arrangement serves the purpose of maintaining inspection quality and Ops QA independence very well. However, it negates Ops QA's ability to assume the role of guardian and preventive control agent.

To be a guardian, the Ops QA needs to have a deep understanding of the operational functions, the process involved, the procedures and the system or tools used to carry out operations, including the circumstances, conditions, or limitations under which the function operates. Such knowledge, combined with analytical and problem-solving capability shall enable the Ops QA to provide consultation services or to find solutions to help the operational functions improve.

On the other hand, the preventive control agent role requires new competency in Ops QA, for instance, data analytics skills. This will enable the organization to make sense of existing findings data, recognize control lapse patterns as well as correlate them with other data or information to identify the underlying root cause to be addressed with enhanced control measures designed to prevent future occurrence.

Aside from the technical knowledge and skill, perhaps, more importantly, the organization needs to first change its current mindset which focuses mainly on the inspection role. It needs to change its current way of exclusive working method, and be more open to sharing, communicating, and collaborating as a team.

The following summarizes the challenges or needs in achieving the business objectives:
1. Change in people's mindset and working methods.
2. Information and knowledge of all operational processes.
3. Understanding of conditions or circumstances faced by operational functions.
4. Skills in problem analysis and problem-solving.
5. Ability to perform data analytics and recognition of control lapse patterns.
6. Enhanced soft skills, for instance, interpersonal skills, clear communication, and critical thinking capability to drive change and influence people.

Planning for the Required Actions

Subsequently, Ops QA has to map out a series of actions to address the challenges. Each action should be carefully designed to fulfill the needs. Based on the identified challenges or needs, the following actions are required: (1) Actions to articulate the vision of next generation Ops QA and its strategy, instill the right culture and process transformation in QA, and (2) Improve internal competence and competence of all operational processes, procedures and support system, (3) Design and conduct effective observation method and process walkthrough, (4) Improve competence focusing in structured thinking, problem analysis, and solution design through a systematic approach, (5) Improve competency in technology and data analytics, and (6) Enhance people soft skill through experiential learning for interpersonal skill development, communication, influencing and critical thinking.

The Table 7 articulates the mapping of challenges/needs with actions.

Table 7
Actions to Address the Challenges/Needs

Challenges/Needs	Actions
Change in people's mindset and working method.	Articulate the next generation Ops QA objectives and the organization strategy. Instill the right culture to achieve the objectives. Transform the work process in Ops QA.
Information and knowledge of all operational processes.	Improve internal knowledge and competence of all operational processes, procedures, and support systems.
Understanding of circumstances or conditions experienced by operational functions.	Design and conduct effective observation method and process walkthrough.
Skills in problem analysis and problem-solving.	Improve competency by focusing on structured thinking, problem analysis, and solution design through a systematic approach.
Ability to perform data analytics and recognition of control lapses pattern.	Improve competency in technology and data analytics.
Enhanced soft skills, for instance, interpersonal skills, clear communication, and critical thinking capability to drive change and influence people.	Enhance people's soft skills through external experiential learning for interpersonal skill development, communication, influencing, and critical thinking.

Identification of Critical Knowledge

The next step in the KM innovation structure is to identify critical knowledge as one of the crucial factors which influence the achievement of the objectives. The critical knowledge should be relevant to the actions and could be used to address the challenges or needs. The Table 8 articulates the required critical knowledge.

Table 8
Identified Critical Knowledge Mapped with Actions

Actions	Critical Knowledge
Articulate the objectives of next generation Ops QA and the organization strategy. Instill the right culture to achieve the objectives. Transform the work process in Ops QA.	The vision and mission statement of Ops QA. Values statement of Ops QA to drive the culture. Process transformation strategy and plan.
Improve internal knowledge and competence of all operational processes, procedures, and support system.	Internal knowledge of operational functions and processes. Internal knowledge of procedures and systems. Knowledge of regulations that influences the process.
Design and conduct effective observation method and process walkthrough.	Analysis of dynamics, conditions, or limitations in operational functions. Special circumstances and exceptions to procedures. Operational system and process handbook.

Actions	Critical Knowledge
Improve competency by focusing on structured thinking, problem analysis, and solution design through a systematic approach.	Methods of problem analysis, problem-solving, and decision-making. Solution analysis and design.
Improve competency in technology and data analytics.	Data Analytic knowledge. Data management manual. Data processing skill. Informational dashboard design.
Enhance people's soft skills through external experiential learning for interpersonal skill development, communication, influencing, and critical thinking.	Interpersonal skill. Effective communication guidelines. Influencing method. Problem-solving, and critical thinking skills.

Identification of Knowledge Management Objectives

Identified actions and critical knowledge serve as the basis on which knowledge management objectives are defined. The alignment of KM objectives with the previous two components determines the confidence level of achieving the intended business objectives. Clear and actionable KM objectives are an important factor in designing the KM Framework which consists of the people, process, and technology aspects. The three aspects work together to ensure the fulfillment of KM objectives. Involvement and enthusiasm of the right people, or the stakeholders, is key, along with the right strategy and KM approaches, supported by technology or appropriate tools.

Based on identified actions and critical knowledge, KM objectives for Ops QA can be defined in (4) four groups as follows:

1. Direction and Culture Building
   a. Provide clear direction of Ops QA vision for innovation and transformation strategy.
   b. Build a sense of ownership in the Ops QA role
   c. Nurture a culture of trust, collaboration, and knowledge sharing.
2. Internal Knowledge Enrichment
   a. Enrich knowledge through learning and sharing.
   b. Knowledge capture through observation and process walkthrough.
   c. The flow of knowledge and ease of access.
   d. Knowledge utilization across different regions.
3. External Knowledge Capture and Skill Development.
   a. Knowledge acquisition from external expert.
   b. Structured data and content storage for ease of data analysis and queries.
   c. Usage of knowledge and continuous practice to sharpen the capability.
4. Sharpening the Soft Skills
   a. Enrich through experiential learning.
   b. Hone the skill through consistent application.

The Table 9 shows the relationships between critical knowledge and KM objectives.

Table 9
Critical Knowledge and KM Objectives

Critical Knowledge	KM Objectives
Vision and mission statement of Ops QA. Values statement of Ops QA to drive the culture. Process transformation strategy and plan.	Direction and Culture Building. Provide clear direction of Ops QA vision for innovation and transformation strategy. Build a sense of ownership in the Ops QA role. Nurture a culture of trust, collaboration, and knowledge sharing.
Internal knowledge of operational functions and processes. Internal knowledge of procedures and systems. Knowledge of regulations that influences the process. Analysis of dynamics, conditions, or limitations in operational functions. Special circumstances and exceptions to procedures. Operational system and process handbook.	Internal Knowledge Enrichment. Enrich knowledge through learning and sharing. Knowledge capture through observation and process walkthrough. The flow of knowledge and ease of access. Knowledge utilization across different regions.
Methods of problem analysis, problem-solving, and decision-making. Solution analysis and design. Data Analytic knowledge. Data management manual. Data processing skill. Informational dashboard design.	External Knowledge Capture and Skill Development. Knowledge acquisition from external expert. Structured data and content storage for ease of data analysis and queries. Usage of knowledge and continuous practice to sharpen the capability.
Interpersonal skill. Effective communication guidelines. Influencing method. Problem-solving, and critical thinking skills.	Sharpening the soft skills. Enrich through experiential learning Hone the skill through consistent application.

Designing the Knowledge Management Framework

After the definition of KM objectives, the focus shifts to determining the involvement of stakeholders, the approach that needs to be taken, and supporting facilities within the three aspects of the KM framework, namely People, Process, and Technology.

The following KM Framework is designed to achieve the KM objectives (Table 10).

The following details articulate KM objectives and KM framework to achieve Ops QA innovation:

Direction and Culture Building

A fully aligned direction is imperative to achieve organizational objectives. This means the vision and mission need to be clearly formulated, strategized, and

Table 10
KM Objectives and KM Framework

KM Objectives	KM Framework		
	People	Process	Technology
Direction and Culture Building. Provide clear direction of Ops QA vision for innovation and transformation strategy. Build a sense of ownership in the Ops QA role. Nurture a culture of trust, collaboration, and knowledge sharing.	QA Head Region QA Leader Area QA Manager Change Agent KM Group	Formulate Ops QA vision, mission, and values statement. Plan KM strategy. Townhall meeting. Change strategy. Alignment meeting.	Internal Portal Multi-media socialization Group messaging Video conference Collaboration tool
Internal Knowledge Enrichment. Enrich knowledge through learning and sharing. Knowledge capture through observation and process walkthrough. The flow of knowledge and ease of access. Knowledge utilization across different regions.	QA Officer Area QA Manager Region QA Leader Auditee Internal Expert: (Ops Dev, IT App Supp, Risk Mgmt)	Knowledge asset identification. Knowledge mapping & taxonomy. Internal learning for procedures & system. Knowledge gain review. Continuous socializa-tion. Peer Assist Operational process. walk-through. After Action Review. Communi-ties of Practice.	Knowledge center (knowledge-based system, lesson learned, internal best practice). Search engine. Expert directory. eLearning system. Collabora tion tool. Helpdesk.
External Knowledge Capture and Skill Development. Knowledge acquisition from external expert. Structured data and content storage for ease of data analysis and queries. Usage of knowledge and continuous practice to sharpen the capability.	External Expert IT Data Mgmt QA Officer Area QA Manager Region QA Leader QA Head QA Support & MIS	External training and certifica-tion. Hands-on practice lab. Data dictionary planning. Datamart structure design. Data analysis methodology. Best practice adoption. How-to-guide design.	Findings Datamart. ETL (extract, transform, load). Structured Query. Language Findings data analytic tools. Findings data pattern and selection. Dashboard.
Sharpening Soft Skill: Enrich through experiential learning. Hone the skill through consistent applications.	HR Learning team QA team all level	Internal experiential learning (role-play, case-based, design thinking, task-based). Knowledge café.	Collabora- tive platform. Virtual simulation. Virtual space for sharing and reflection.

properly communicated to drive and guide the organization throughout the journey. Another important factor is culture. A cross-industry, size, and geography survey on the top management of multiple companies held in 2016 revealed that the organization's culture played a critical role and impact on its ability to achieve its mission and vision (Deloitte, 2016).

Furthermore, organizational culture is believed to have a significant influence on knowledge management implementation because both shares the involvement of human interaction. Culture is considered an important factor in knowledge management effort and its sustainability (Alavi, Kayworth, & Leidner, 2006). Organizational structure and leadership also have a strong impact on knowledge management (Magnier-Watanabe, Benton, & Senoo, 2011).

Therefore, the Ops QA organization should pay a great deal of attention to all the important factors related to leadership, structure, and culture that influence its ability to achieve its objectives.

People.

The stakeholders who play a key role in direction-giving and culture-building consist of the Leaders of the QA division, the region QA lead, the area QA manager, and the officers appointed as change agent and KM group in Ops QA.

Process.

Leaders of the Ops QA division should formulate the vision of next generation Ops QA and the statement of mission and values. KM strategy needs to be carefully planned, including articulation of a sound business case to convince the organization and management. Communication and socialization are conducted through town hall meetings. Dissemination of information in a regular manner has to be carried out through alignment meetings in region QA and Area QA where information is continuously cascaded and discussed. Culture building played an integral part in achieving the Ops QA vision, particularly the right culture of ownership, trust, collaboration, and knowledge sharing. This is in line with the result of research conducted by Chang, Liao, and Wu (2017) which shows that culture influence the capability of innovation in an organization.

The right culture can be instilled through values statements and constant communication and perhaps

most importantly, through a strong change strategy in Ops QA which will drive the shifts in behavior, for instance through (1) positive reinforcement in any level of Ops QA starting from the top to down, (2) fair performance appraisal and reward system by any supervisor in Ops QA, (3) well-communicated goal setting from divisional level down to QA staff, and (4) mentoring and coaching by QA head, region QA leader, QA manager as well as area QA manager.

Technology.

Deloitte, in one of its studies in 2013 elaborates on the important role played by digital collaboration tools and their impact on innovation and collaboration. Hence, in supporting its innovation objective, the Ops QA needs to consider digital collaboration tools that could be used to optimize the dissemination of direction and culture building. Information portal enables continuous communication of direction and campaign of culture change. Socialization serves as an information feed that could promise a higher level of understanding if delivered using different types of media, for instance, video, infographics, and illustration. Group messaging and video conference is essential in ensuring effective collaboration across distant geographical locations where staff in Ops QA reside.

Internal Knowledge Enrichment

A knowledge management system benefits the organization in managing knowledge, externalizing and accumulating individual know-how into organizational knowledge, as well as sharing the knowledge (Li, Chaudhry, & Zhao, 2006). Hupic, Poulouch, and Rzevski (2002) mentioned that knowledge management is the means for the organization to be more effective and competitive.

In this sense, the Ops QA organization needs to embark on knowledge management efforts to manage internal knowledge related to operational processes, procedures, and systems used by the operational functions in addition to prevailing knowledge of quality assurance procedures and inspection checklists. Through knowledge management, the staff in the Ops QA division will be able to make use of and combine the knowledge to draw potential improvements.

People.

The stakeholders who played a key role in internal knowledge enrichment consist of the region QA lead, the area QA manager, and QA officers from within the organization, as well as stakeholders from outside Ops QA namely, the auditee and internal experts comprising operations development staffs who has expertise in operational processes and procedures, IT application support staffs who has expertise in the core banking system and applications and risk management staffs who has expertise in overall operational risk management.

Process.

To achieve internal knowledge enrichment, Ops QA needs to, first, identify knowledge assets in Ops QA and map the knowledge in a standardized taxonomy to enable ease of access and effective utilization, as well as encourage the use of knowledge to find improvement opportunities. An internal learning session should be held regularly within Ops QA to ensure knowledge gain for all operational processes and procedures including the system. The knowledge gained as a result of the learning process needs to be measured and reviewed to ensure learning effectiveness. In addition to a learning session, continuous socialization efforts could help ensure updates from recent development are well communicated. "Peer assist" practice is useful to provide a support system among employees in Ops QA which will encourage knowledge sharing and collaboration in problem-solving. This process could be conducted among Ops QA employees at all levels through individual or small group teaching sessions. Operational process walkthrough by a different group of QA staff will bring the benefit of hands-on learning and help employees in Ops QA gain a more comprehensive operational process knowledge and experience, including building awareness of any specific circumstances or conditions which may affect process outcome. "After-action-review" is another process that needs to be conducted after any project or improvement by Ops QA to gain the lesson learned from the implementation. Communities of practice should be established regularly, for instance once every month whereby Ops QA staff take turns in discussing their experience during inspection or other activities. The communities of practice will help Ops QA gain the advantage of capability building through experience and knowledge sharing among employees in Ops QA. It may also help reduce or even avoid duplication of work as Ops QA learn from one another.

Technology.

In supporting internal knowledge enrichment, related application systems and tools could be used to optimize the outcome. A knowledge center could be utilized to support knowledge stock and flow in the

KM process through: (1) a knowledge-based system hosting knowledge of the process, procedures, regulations, and application systems including past initiatives and lesson-learned as well as internal best practices, (2) search engine capability for ease of information access, and if possible, as intuitive as a well-known search engine in the internet, for optimum effectiveness and experience, (3) expert directory is useful to provide "yellow pages-like" method to locate and contact the need expert (4) e-Learning system is the preferred computer-based learning environment which guarantees the flexible anytime and anywhere learning and learning gain measurement, (4) collaboration tools which will encourage further discussion and information exchange for knowledge sharing, and (5) setting up the information helpdesk for inquiry service and guidance by expert feature to solve cases of doubt and confusion.

External Knowledge Acquisition and Skill Development

Leber, Buchmeister, and Ivanisevic (2015) suggested that there are two basic aspects of innovation, namely (1) knowledge creation whereby the new knowledge is introduced, and (2) knowledge application whereby knowledge is put into practice to get its potential.

In addition to making use of its internal knowledge, the Ops QA organization has to also acquire new knowledge from external sources and put the knowledge into practice to gain new skills. This is in line with the conclusion presented by Indarti (2017), that external knowledge absorption and interaction encourage organization innovation capability.

The new skill set in data processing and analysis could help Ops QA to make sense of the information and knowledge accumulated from its activities. Findings from inspection could be analyzed to identify patterns and even linked with other data, for instance, incidents or near-miss data to find any correlation or to build enough understanding to perform predictive analysis for preventive control needed to improve operational activities, as the previous study has shown that usage of predictive analytics is evident in many areas in banking, including operations optimization (Kikan, Singh, & Singh, 2019).

People.

The stakeholders who played a key role in external knowledge acquisition and skill development consist of the expert in data processing and analysis as well as expert in IT data management from outside Ops QA

organization as well as internal staff namely region QA lead, area QA manager, QA officers, and QA support and MIS. Training sessions with external experts and IT data management will help Ops QA employees gain the required knowledge and subsequently develop the skill through hands-on learning sessions and continuous practice.

Process.

External knowledge acquisition and skill development could be achieved through KM processes as follows: (1) enroll potential Ops QA staff in a series of external training and certification for the data processing and analysis skill, (2) establish hands-on practice lab sessions in Ops QA where related Ops QA staffs could put its newly gained knowledge and skill into practice, (3) conduct planning activity to build Ops QA data dictionary, (4) conduct design activity for Ops QA DataMart, (5) develop Ops QA data analysis methodology, for instance, findings pattern recognition, correlation or symptom identification. In addition to the processes mentioned above, Ops QA also needs to continuously be aware of best practice development and plan the best practice adoption accordingly. Tacit knowledge and skill gained throughout the whole process need to be made explicit in Ops QA through proper documentation, for instance in the form of designing the how-to-guide which can be used for subsequent knowledge transfer and skill development for a larger group of Ops QA staff.

Technology.

The related technology which needs to be implemented to support this objective includes (1) Ops QA Datamart to store inspections findings data in a structured manner, (2) ETL script for data extraction, transformation, and loading from multiple related data sources into the Ops QA Datamart, (3) Structured query language for data queries and processing, (4) data analytic tools which will assist data analysis, for instance, descriptive, diagnostic, predictive, and prescriptive analysis, (4) data pattern, for instance, findings data pattern or trends and correlation as the result of data analysis, and (5) dashboard system to infer and interpret the result as well as to visualize and communicate the message derived from data analysis activity.

Sharpening Soft Skills

According to Gault (2018), the abilities that foster innovation include information gathering, insights drawing from experience, and active networking skills. Workers who have soft skills can innovate new ideas and find better solutions (Afroze, Eva, & Sarker, 2019).

Thus, the Ops QA division needs to work on sharpening the soft skill of all levels in the organization. Soft skill is essential not only in the inspection process but equally, if not more important when Ops QA wanted to assume the role of guardian and preventive control agent. Both roles require a lot of soft skills, for instance, interpersonal skills, clear communication, work as a team, problem-solving capability, critical thinking capability, problem analysis, and decision-making and organizational skill, for Ops QA to be able to make an impact, drive the change and have a strong influence in the Operations Directorate organization. Ops QA could sharpen the soft skills of its staff by enrichment through experiential learning and consistent practice and application to hone the skills.

People.

The stakeholders who played a key role to sharpen soft skills in Ops QA includes employees in all level of Ops QA, including the QA head, regional QA lead, QA manager, area QA manager, QA officers, and QA support staff, as well as people from outside Ops QA organization, namely HR learning team, who will help Ops QA design, develop and deliver the experiential learning for soft skill enrichment.

Process.

To sharpen the soft skills, Ops QA should embark on knowledge management processes that bring people together and physically facilitate teamwork. Although digital online collaboration tools nowadays provide ease of communication, personal face-to-face contact is still more favorable and believed as a good option (Lopes, Oliveira, & Costa, 2015)

Following are the knowledge management processes that the Ops QA needs to focus on to achieve this KM objective:

a. An internal experiential session that conducts learning through various experience-based methods of role play, problem-based learning, design thinking or brainstorming as well as task-based learning. The methods used shall complement each other in helping develop the required level of soft skills for Ops QA.

b. Knowledge café, where a group of people in Ops QA are brought together for free and open communication, discussion, and sharing of thoughts to build relationships, make a better sense of Ops QA, develop a sense of ownership and improve ways of working and improve together.

Technology.

Stronger relationships are achieved through collaboration. This means the organization should choose technology that encourages relationship development and communication improvement (Deloitte, 2016).

Various tools for this purpose are available today, including email, instant messages, audio/video conferences, file sharing, social networks, blogs, and others. Research by Lopes *et al.* (2015) indicates that email and file sharing, due to its asynchronous nature are perceived negatively in supporting relational bonds and sharing of information. This is in line with survey results where 76% of executives across the industry predicts that organization will move away from email and shift to digital tools which provide rich features (Deloitte, 2016).

The Ops QA organization should therefore opt for platforms that allow strong relationship building and effective communication, namely:

a. Collaborative platform which could facilitate real-time communication and interaction of Ops QA officers, managers, and leaders through the virtual workspace. The virtual workspace is particularly important considering Ops QA employees are spread geographically throughout the country

b. Virtual simulation tools that could facilitate experiential learning, for example through methods such as gamification, scenarios, and avatars for role-playing, problem-solving simulation, situational challenge, and others,

c. Virtual space for sharing and reflection, which serves as an internal blog where people can write down their thoughts or reflections on any aspects of life in an asynchronous manner and, if needed, anonymously. Virtual space as such could encourage people in Ops QA to learn how to communicate their thoughts to effectively convince and influence others.

Limitations and Future Research

The scope of this research is limited to only one divisional unit within the bank's organization. It aimed to analyze and find solutions to address specific innovation needs of a single division, using the knowledge management discipline. Although the research method is likely still applicable and relevant to other divisions in the bank's organization, however, in a wider context, the relationship and interdependency among organizational units may pose a completely different challenge that will significantly impact the effectiveness of the knowledge management strategy.

Future research could be done for a larger innovation context that involves multiple functional units, or for open innovation objective, this research could be replicated only to a limited extent, for instance, the assessment of the knowledge management capability

maturity which will still be relevant for larger scope and audience. However, in terms of the analysis of gaps and solution design, in addition to the method used in this research, a more integrated approach should be taken while also considering other different aspects that greatly shall influence the outcome, for example, hierarchical influence, relationship, interdependency, as well as cultural and alignment of objectives of multiple units and elements involved.

Conclusion

To meet the management expectation for the Ops QA division to contribute more in guiding operational functions upgrading its efficiency and effectiveness and enhancing internal control capability, Ops QA has to innovate to extend its role from mere inspector into guardian and preventive control agent roles. The new roles require knowledge and advanced capabilities which Ops QA is currently lacking.

The knowledge management discipline provides a method in which the Ops QA could plan and embark on a knowledge management strategy to address the identified gaps and capability issues to achieve the expected innovation. In planning the knowledge management strategy, the Ops QA organization should first clearly elaborate on its innovation objectives. With clear objectives in mind, the organization could proceed with a series of steps involving the identification of challenges and needs to achieve the objectives, planning for actions to address the identified challenges, classifying the critical knowledge required for the objectives, and finally translating them into knowledge management objectives and knowledge management framework. The framework should provide clear and implementable knowledge management approaches or initiatives, within three knowledge management components of people, process, and technology.

Once the knowledge management strategy is defined, the management should work on the knowledge management implementation project, including securing the resources and budget needed, being committed to the implementation process, closely overseeing the progress, and providing guidance to solve shortcomings or obstacles. Management involvement is key to the success of knowledge management implementation and to bringing the full benefit of the transformation in culture, process, and knowledge to achieve the Ops QA innovation objectives.

For further development, the management could also consider expanding the knowledge management approach in other functions or lines of business within the bank to reap the benefit of knowledge management

for various other innovation use cases to achieve not only operational excellence but improve overall Bank Bakti Karya Purna's competitiveness.

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