A Knowledge-Life Cycle Driven Riva Business Process Architecture

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Abstract: - The life cycle of knowledge involves various processes in knowledge management (KM) that vary across different models. To effectively utilize these processes at an advanced level, aligning them with the organization's fundamental business processes is necessary. Business process architecture (BPA) serves this purpose by identifying these core processes and emphasizing their interconnections. One such BPA approach is the Riva method, which characterizes these key processes using essential business entities (EBEs) and outlines steps for developing an organization's overall BPA. Integrating knowledge management processes into these steps explains KM's role in business process modeling (BPM) and contributes to addressing gaps in existing BPM. The use of Riva-BPA steps as a backbone for incorporating knowledge management into process modeling has led to the proposal of the Riva-based Knowledge Life Cycle (KLC-RBPA) model. The KLC-RBA model accommodates the Riva steps and introduces a unique "sharing and dissemination" phase, improving organization process awareness. This model consists of four stages: identify and explore, refine and acquire, create and exploit, and share and disseminate knowledge. The exploration and identification phases aim to search and discover resources relevant to the scope and objectives of a specific organization (Riva step one). The capture and refinement process ensures the entry of potentially captured EBEs, detects them, and passes them to the evolution process (Riva steps two and three). The process of creation and exploitation creates dynamic relationships between units of work (UOWs), converting UOWs' diagrams into first and second process designs (Riva steps four, five, and six). Lastly, sharing and disseminating the BPA emphasizes internal knowledge sharing, improving organizational workflow, and enhancing the perception of BPA processes. A quantitative approach using an online survey questionnaire was distributed to 40 domain experts from computer science and software engineering to evaluate this model. Accordingly, the results demonstrate agreement on the relevance of knowledge processes to the Riva method steps. Furthermore, it confirms positive linear correlations between KLC-RBPA model phases, specifically between knowledge sharing and dissemination and knowledge creation and exploitation.

Key-Words: - Riva method, business process architecture, knowledge management, knowledge life-cycle, knowledge management processes, business process modeling.

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1 Introduction

Achieving strategic goals requires the management of the appropriate processes effectively, [1]. A business process architecture (BPA) nominates the essential processes to develop a specific business. It overviews how these processes are launched and managed over time, [2]. The effectiveness of combining knowledge management enablers (KMEs), such as information technology and organizational structure, with BPA has been demonstrated in the development of a competitive and dynamic BPA, [3]. This approach also emphasizes the importance of a knowledge-based approach to BPA modeling. However, ensuring the KMEs' interaction with every step of the process architecture (PA) is still necessary. By implementing knowledge management processes (KMPs), coverage of the more comprehensive nature of these steps can be achieved. Furthermore, KMPs are a benchmark for effectively integrating the BPA domain with the KM area.

Knowledge Management encompasses two distinct perspectives: one focuses on the process, while the other centers on the object. According to the process approach, knowledge is held by individuals and necessitates interaction within a social framework to enable its sharing and dissemination, [4]. In this context, conscious attempts to regulate knowledge management within an organization, such as capturing, sharing, creating, implementing knowledge, and assimilating, are considered key processes. Consequently, knowledge management can be defined as a set of strategic measures implemented in an organization to facilitate learning and effective use of knowledge, [5].

This study proposes a Riva-based Knowledge Life Cycle (KLC-RBPA) model, which integrates KMPs into BPA modeling based on the Riva method, an object-oriented approach. By embedding specific KMPs, the model provides a structured knowledge life cycle suitable for BPA development. A quantitative evaluation was conducted with 40 computer science and software engineering domain experts. The findings validate the model's effectiveness, identifying its potential to enhance BPA frameworks.

2 Modeling Process Architecture with the Riva Approach

Process architecture modeling provides a systematic overview of the processes within an organizational context, linking key processes crucial for business development, [6]. It also aids in transforming business processes into application models utilized by information technology (IT) systems, [7].

The Riva method is one of the BPA techniques encompassing different models, including object-based, action-based, goal-based, function-based, and reference-based approaches, [8]. This method offers a systematic and straightforward approach to developing process architectures using essential business entities (EBEs) in various business settings. The steps involved in this method are as follows:

Step 1: Establishing agreement on the business scope and organizational field

This initial step entails identifying and defining the organization's domain and business boundaries. As [9] articulated, the organization can be broadly interpreted as "whatever we want to look at," encompassing entities such as banks, hospitals, stock markets, or airports.

Step 2: Brainstorming Candidate Essential Business Entities (CEBEs) and Designating Essential Business Entities (EBEs)

In this phase, brainstorming sessions are conducted to identify CEBEs that embody the essence of the organization's business. Subsequently, these CEBEs are refined into EBEs, acknowledged as crucial due to their integral role in defining the business's core operations, [9]. Specific criteria are employed to filter and extract EBEs from CEBEs.

Step 3: Selecting Units of Work (UOWs)

UOWs, characterized by a distinct lifespan, are identified as EBEs necessitating monitoring. Additional filters are applied to exclude non-UOWs from consideration.

Step 4: Establishing dynamic relationships among UOWs and formulating a UOWs diagram

Dynamic relationships among UOWs are identified when a new UOW emerges during the existence of an existing one. These relationships are depicted using arrows, although not every UOW needs to be interconnected.

Step 5: Converting the UOWs Diagram into the first Cut PA Diagram

During this stage, the first cut of the process architecture is introduced. Each UOW is translated into a Case Process (CP) and a Case Management Process (CMP). A CP represents an instance of a process, while a CMP manages the flow of these instances.

Step 6: Refining the first Cut PA into the second PA

The second iteration of the PA is derived using Riva heuristics, [9]. These heuristics simplify the first cut PA to better reflect the real business environment. Heuristics include merging CMPs into requesting CPs when the CMP serves as a task force, consolidating two CMPs into one when no distinction exists between them, adjusting delivery chains, merging CMPs into requesting CPs when their root UOWs are part of another UOW, and considering cases of empty CMPs when only one case instance of CP exists.

A cutting-edge approach using the KLC-RBPA model integrates knowledge management processes (KMPs) with the Riva BPA method to achieve optimal results. This model introduces a distinct "sharing and dissemination" phase that addresses gaps in organizational process awareness and adaptability of BPA frameworks. However, to seamlessly incorporate the appropriate KMPs, a comprehensive understanding of the chosen KMPs is essential. Previous studies have primarily focused on aligning principles from business process modeling with knowledge life cycles and categories, encompassing both non-formalizable and formalizable knowledge, [10].

3 Reviewing KMPs in the Literature

Knowledge, as a concept, can be defined as a dynamic interplay between cognition and behavior. This viewpoint highlights the continuous motion and practical implementation of knowledge and its various stages in its formation, dissemination, and allocation, [11]. These stages are necessary to fully exploit the knowledge generated and create (and improve) added value, [12]. In addition, they are required to progress and sustain innovation in production, [13].

Organizations have established various models to improve operational efficiency and increase competitive advantage. These models focus primarily on knowledge generation, dissemination, and use, [14].

Subsequently, other critical additional processes, such as data storage, extraction, transfer, and usage, were identified and mapped to the previously mentioned processes, [15]. Some of these KMPs require efforts to identify inventions, while some KMPs themselves have been identified as innovation enablers/accelerators. After reviewing 45 research papers, [16] highlighted the direct contribution and impact of KMPs on innovation. Other factors, such as organizational learning and absorptive capacity, influence innovation. Application and knowledge creation are seen as a bridge between KMPs and other knowledge-related processes that impact innovation differently.

Regarding the relationship between IS and KMPs, [17] systematically reviewed existing KMP models from 2001 to 2018 using academic databases such as Wiley, ScienceDirect, IEEE, and Springer, the most widely used electronic databases. They concluded that knowledge sharing was the most common process, and knowledge acquisition and application were subsequent. Recent studies adopted these processes to analyze KM applications, [18]. Questionnaires are the most commonly used data collection method in the KMPs literature. Other vital gaps are highlighted, such as widely used information systems (e.g., knowledge management systems, e-commerce, information systems outsourcing, etc.).

To contextualize the KLC model, the authors conduct a data-driven empirical study that comprehensively examines the knowledge management processes (KMPs) in the key KLC model widely used by knowledge management practitioners and endorsed by knowledge management scientists and colleagues. For example, [19] studied the KLC (Knowledge Life Cycle) model—a groundbreaking model of how organizational knowledge is created over time. Combined with previous work, these models provide valuable insights into the specific processes of enterprise knowledge management. Some well-known models are analyzed, particularly the knowledge life cycle model of [20] and [21]. Another interesting scientific study is presented by [22], who reviewed 160 frameworks representing knowledge management processes (mainly from practitioner literature) and identified five important process types: identification, creation, sharing of knowledge, applications, and storage.

Meanwhile, [19] applied some of the above models. They developed their knowledge management life cycle, which consists of seven consecutive phases: identify, share, store, exploit, learn, improve, and create. Practitioners proposed variations on the previous KLC Model in the form of key knowledge management initiatives, activities, and techniques related to organizational knowledge assets. This time, the KLC model presented here was developed differently. It has been technically integrated, focusing on the main BPA areas and the key steps for integration and evaluation in this form of software engineering.

Lastly, nominating cognitively diverse KMPs through their respective models and the expected impact is incomplete without indicating exploration and exploitation processes. These two key processes were proposed to drive organizational success, as [23] suggested. They often also form a shared basis between dynamic capability and KM fields, [24]. Exploration, such as search, experiment, discovery, and innovation, are key activities that enable organizations to discover and capture new ideas. In contrast, exploitation, such as refinement, production, implementation, execution, and efficiency, enables organizations to develop and use what they have, [25].

4 A Knowledge Life-Cycle Model Adapting BPA

To create the Riva BPA, it is crucial to determine the appropriate KMPs aligned with each step in the Riva method. Each step corresponds to a defined role of KMPs, allowing for systematically integrating knowledge processes into BPA. As a result, a set of KMPs has been selected to be organized sequentially based on the steps of the Riva method. This collection of KMPs forms the KLC model, which adapts the BPA (Figure 1, Appendix).

The declaration of each KMP with Riva's step(s) proceeds as follows.

4.1 Exploration and Identification of Knowledge

Step one: Business Scope Agreement

The initial stage of the Riva method can be seamlessly incorporated into knowledge exploration and identification processes. Knowledge exploration encompasses various activities, including observation, search, and discovery [26], whereas knowledge identification involves identifying crucial elements such as objectives, participants, resources, and existing materials, [27]. As a result, selecting the business field and determining its pertinent resources could be integrated into these processes.

4.2 Capturing and Refinement of Knowledge

Steps two and three: Brainstorm the CEBEs and definition of the EBEs, selection of the units of work (UOWs)

The act of capturing knowledge involves the conversion of tacit knowledge into explicit knowledge, [27]. Within the Riva method, the primary means of capturing knowledge is through brainstorming sessions with domain experts, which leads to the identification of CEBEs. In addition, a knowledge refinement process is carried out every time UOWs and EBEs are reviewed and selected during Riva Phase 2 and 3, whereby refining knowledge involves adding or removing rules to achieve generalization and specialization of knowledge, [28]. In particular, in the second and third phases of Riva, specific rules distinguishing CEBE and EBE were implemented to extract UOW.

4.3 Creation and Exploitation of Knowledge

The fourth, fifth, and sixth steps involve establishing dynamic relationships between UOWs, creating a UOWs Diagram, and transforming the UOWs diagram into the first and second PA Diagrams

Different methods are used to generate knowledge - through experimentation, the development of innovations, and the observation of fundamental processes in the environment or the importation of knowledge, [27]. Knowledge importation practices and observation could be integrated into generating dynamic relationships among UOWs and developing their diagram. Knowledge import refers to eliciting knowledge from manuals and subject matter experts. Knowledge observation refers to actually entering the environment and understanding its actual processes. In the fourth step of the Riva approach, the dynamic link between UOWs and their diagram generation is supported by materials of processes and expert feedback in a case study. UOWs' diagram could also be further developed by visiting the environment and observing its operations and processes.

Applying Riva's UOWs diagram is the key to developing first and second-cut PA diagrams. Steps five and six of the Riva method focus specifically on this development. They fall under the category of knowledge exploitation, that is, using, developing, and giving input to existing knowledge, [29]. At the same time, the reduction of Riva's first cut of PA, which represents the Riva heuristic, is applied to develop the second cut of PA, ensuring the actual relevance of organizations' environmental processes.

4.4 Sharing and Dissemination of Knowledge

Step seven (new step): Sharing the Riva BPA diagrams with the organization's members to understand and develop the overall flow of business and its principal processes

An organization's BPA development should be followed by an internal sharing and dissemination of its elements and diagrams. Sharing and dissemination require communicating and collaborating on a knowledge asset and making it visible, available, and accessible to others, [19]. This could be translated through communicating the Riva BPA among the employees and collaborating to ensure it is explicit and reflexive to the real business environment.

5 Research Methodology

The knowledge life-cycle model adapting Riva BPA requires domain experts to be evaluated. A quantitative approach was adopted for this evaluation since it was appropriate for collecting data remotely from different experts and was more economical regarding research time and effort. In addition, domain experts were preferred, depending on their knowledge and experience in business process modeling. Accordingly, the quantitative approach was followed based on an online survey questionnaire developed to assess the use of KMPs in each phase of the model. Each phase of the model comprises one or more Riva steps with the mapped KMPs and is presented in a group of paragraphs. These paragraphs describe KMPs' activities in Riva's steps. They also measure the extent of the KMPs' utilization. The questionnaire was distributed using a link to 40 domain experts to respond.

Table 1. Survey questionnaire of KLC adapting Riva BPA steps

No.	Question
Knowledge exploration and identification (Riva step one)	
Q1.	Defining the scope of an organization's business requires finding what resources are included.
Q2.	Searching and observation ensure that nominated resources belong to the business domain and boundary.
Q3.	Understanding an organization's business domain is imperative for accurately determining its objectives, delineating employee roles and positions, and ensuring primary resources.
Knowledge capturing and refinement (Riva steps two and three)	
Q4.	Brainstorming CEBEs helps identify and document any lacking CEBE that represents an organization's business.
Q5.	The descriptions and constraints associated with an organization's EBEs vary from those of CEBEs.
Q6.	Inspecting an organization's UOWs involves filtering through various EBEs.
Knowledge creation and exploitation (Riva steps four, five, and six)	
Q7.	Visiting the business environment of an organization and watching the workflow facilitate understanding the interaction between different UOWs.
Q8.	The development of the UOWs diagram is an output and translation of creating dynamic relationships among UOWs.
Q9.	An organization's first cut PA development corresponds to the UOWs diagram and is implemented by its utilization.
Q10.	Additional modifications that refine first-cut PA into second-cut PA enhance the efficiency and alignment of PA diagrams with the organization's actual environment.
Knowledge sharing and dissemination (Suggested new Riva step)	
Q11.	A BPA should be available and accessible to every member of an organization.
Q12.	Allocating an organization's BPA to a limited number of employees makes it less valuable and useful.
Q13.	Communicating and distributing the BPA with its elements and diagrams is necessary to improve employees' awareness and understanding of an organization's workflow and business.
Q14.	The presentation and transfer of BPA contribute to further ideas and development in a business environment.

The researcher has ensured that experts are also knowledgeable about the Riva method and has summarized the Riva steps before the respondents fill out the questionnaire. The respondents were required to answer the questions according to the five-point Likert scale. The questions included demographic and Likert scale questions (Table 1).

6 Data Analysis and Research Findings

Descriptive statistics were used to present the findings of this paper. These statistics include the minimum, maximum, mean, and standard deviation. The 40 experts have submitted their answers to the questionnaire. Based on their responses, the following findings were reported according to each cycle of the model.

6.1 Knowledge Exploration and Identification

The knowledge processes of exploration and identification were proposed in the first phase of the KLC-RBPA model. Three questions were assigned to assess the significance of these processes through a set of activities. These activities were distributed among these questions. Table 2 shows the mean and other statistics of each question. An overall agreement to all phase questions (mean = 4.0278) was reported according to the responses of the domain experts' participants (Table 6). Q3 reported the most significant number of agreements with a maximum mean = 4.17, and no disagreement was recorded. Accordingly, domain experts have agreed on the significance of the activities that present this phase's KM processes.

Table 2. Descriptive Statistics of the First Phase of the KLC-RBPA Model

Descriptive Statistics						
	N	**Min**	**Max**	**Mean**	**Std. Deviation**	**Variance**
Q2	**40**	**3**	**4**	**3.83**	**0.389**	**0.152**
Q1	**40**	**3**	**5**	**4.08**	**0.515**	**0.265**
Q3	**40**	**4**	**5**	**4.17**	**0.389**	**0.152**
Valid N (listwise)	**40**					
Note: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree. N = 40						

6.2 Knowledge Capturing and Refinement

The knowledge processes of capturing and refinement were proposed in the second phase of the KLC-RBPA model. Three questions were assigned to assess these processes through a set of activities. Table 3 shows the mean and other statistics of each question. An overall agreement to all phase questions (mean = 3.7778) was reported according to the responses of the domain experts' participants (Table 6). Q6 reported the most significant number of agreements with a maximum mean = 3.92, and no disagreement was recorded. Thus, domain experts have agreed on the significance of the activities that present this phase's KM processes.

Table 3. Descriptive Statistics of the Second Phase of the KLC-RBPA Model

Descriptive Statistics						
	N	**Min**	**Max**	**Mean**	**Std. Deviation**	**Variance**
Q4	**40**	**1**	**5**	**3.67**	**1.073**	**1.152**
Q5	**40**	**3**	**5**	**3.75**	**0.622**	**0.386**
Q6	**40**	**3**	**5**	**3.92**	**0.669**	**0.447**
Valid N (listwise)	**40**					
Note: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree. N = 40						

6.3 Knowledge Creation and Exploitation

Capturing and refinement were proposed as KM processes in the third phase of the KLC-RBPA model. Four questions were assigned to assess these processes through a set of activities. Table 4 shows the mean and other statistics of each question. An overall agreement to all phase questions (mean 3.9792) was reported according to the responses of the domain experts' participants (Table 6). Q7 and Q10 reported the most significant number of agreements with the same maximum mean = 4.08, and no disagreement was recorded. Thus, domain experts have agreed on the significance of the activities that present this phase's KM processes.

Table 4. Descriptive Statistics of the Third Phase of the KLC-RBPA Model

Descriptive Statistics						
	N	**Min**	**Max**	**Mean**	**Std. Deviation**	**Varian ce**
Q9	**40**	**1**	**5**	**3.75**	**1.055**	**1.114**
Q8	**40**	**2**	**5**	**4.00**	**0.853**	**0.727**
Q7	**40**	**3**	**5**	**4.08**	**0.669**	**0.447**
Q10	**40**	**3**	**5**	**4.08**	**0.669**	**0.447**
Valid N (listwise)	**40**					
Note: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree. N = 40						

6.4 Knowledge Sharing and Dissemination

Finally, knowledge sharing and dissemination were proposed to map a new proposed step in Riva BPA, the fourth phase of the KLC-RBPA model. Four questions were also assigned to assess these processes through a set of activities. Table 5 shows the mean and other statistics of each question. An overall agreement to all phase questions (mean 3.6875) was reported according to the responses of the domain experts' participants (Table 6). Q14 reported the most significant number of agreements with a mean = 3.92, and no disagreement was recorded. Hence, domain experts have agreed on the significance of the activities that present this phase's KM processes.

Table 5. Descriptive Statistics of the Fourth Phase of the KLC-RBPA Model

Descriptive Statistics						
	N	**Min**	**Max**	**Mean**	**Std. Deviation**	**Variance**
Q11	**40**	**1**	**4**	**3.42**	**0.996**	**0.992**
Q12	**40**	**3**	**4**	**3.58**	**0.515**	**0.265**
Q13	**40**	**3**	**5**	**3.83**	**0.718**	**0.515**
Q14	**40**	**3**	**5**	**3.92**	**0.669**	**0.447**
Valid N (listwise)	**40**					
Note: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree. N = 40						

6.5 General Descriptive Statistics and Correlation among Phases of the KLC-RBPA Model

Overall descriptive statistics were presented in Table 6 and utilized in each previous phase, specifically the mean of all responses. Knowledge creation and exploitation processes followed by knowledge exploration and identification have reported the highest means (4.0278,3.9792) sequentially. These are the first and third phases of the KLC-RBPA model. The mentioned phases in the model reflect significant processes in the KM field, such as knowledge exploration and exploitation. Other remaining phases have also reported above-average means that also referred to an overall agreement with the KM processes mapped to these phases.

Table 6. Descriptive Statistics of All Phases of the KLC-RBPA Model

Descriptive Statistics						
	N	**Min**	**Max**	**Mean**	**Std. Deviation**	**Variance**
Sharing & Dissemination	**40**	**2.75**	**4.25**	**3.6875**	**0.55519**	**0.308**
Capture & Refinement	**40**	**3.00**	**4.67**	**3.7778**	**0.53811**	**0.290**
Creation & Exploitation	**40**	**2.75**	**5.00**	**3.9792**	**0.60733**	**0.369**
Exploration & Identification	**40**	**3.67**	**4.33**	**4.0278**	**0.26432**	**0.070**
Valid N (listwise)	**40**					
Note: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree. N = 40						

The final phase of the KLC-RBPA model has suggested a new Riva step that was mapped to knowledge sharing and dissemination. This step implies sharing BPA diagrams and elements with an organization's members to understand and develop the overall flow of business and its principal processes. Therefore, this phase could be considered an independent variable that impacts and measures all remaining phases that present dependent variables. A Correlation test using Pearson's Correlation Coefficient (R) was used to explore the relationships among the KLC-RBPA model phases (Table 7).

Table 7. Values of Pearson's Correlation Coefficient (R) among KLC-RBPA Phases

Correlations					
		EXR & ID	**CA & REF**	**CR & EXP**	**S & D**
EXR & ID	**Pearson Correlation**	**1**	**0.047**	**0.334**	**0.271**
	Sig. (2-tailed)		**0.884**	**0.288**	**0.394**
	N	**40**	**40**	**40**	**40**
CA & REF	**Pearson Correlation**	**.047**	**1**	**0.657***	**0.380**
	Sig. (2-tailed)	**0.884**		**0.020**	**0.223**
	N	**40**	**40**	**40**	**40**
CR & EXP	**Pearson Correlation**	**0.334**	**0.657***	**1**	**0.805****
	Sig. (2-tailed)	**0.288**	**0.020**		**0.002**
	N	**40**	**40**	**40**	**40**
S & D	**Pearson Correlation**	**0.271**	**0.380**	**0.805****	**1**
	Sig. (2-tailed)	**0.394**	**0.223**	**0.002**	
	N	**40**	**40**	**40**	**40**
***. Correlation is significant at the 0.05 level (2-tailed).**					
****. Correlation is significant at the 0.01 level (2-tailed).**					
EXR & ID: Exploration & Identification CA & REF: Capture & Refinement CR & EXP: Creation & Exploitation S& D: Sharing & Dissemination					

The above table shows a positive correlation among all model phases since R values are between 0 and 1. Nevertheless, these relationships are not strong except in two positions: R-value between the phases of capture and refinement and creation and exploitation, R = 0.657, and R between phases of sharing and dissemination and creation and exploitation, R = 0.805. The previous value denotes a strong positive linear correlation among the nominated phases. Finally, according to R values, we conclude that the sharing and dissemination phase is related to other phases of the KLC-RBPA model. Nevertheless, these relationships are only strong and evident in the creation and exploitation phase.

After all preceding results, we conclude that KLC-RBBPA has proposed a set of sequenced and compatible KMPs that address steps of a significant BPA method and are appropriate to be applied as a benchmark for its evaluation. Such an outcome could facilitate the combination of KM with the business process modeling area. Furthermore, it supports and drives KM for more technical use in different domains.

7 Conclusion and Future Work

This paper emphasizes the pivotal role of KMPs in advancing BPA. By aligning KMPs with the steps of the BPA, their significance becomes evident in business growth. Moreover, they can serve as a benchmark for evaluating the execution of these steps. The Riva method stands out as one of the BPA methodologies with clearly defined steps for developing a PA. These steps can be viewed as a sequential set of KMPs and applied as a model for the knowledge life cycle. Adapting the Riva steps through the KLC model has created the Knowledge Life-Cycle Riva BPA (KLC-RBPA) model. This model adapts the Riva BPA to address gaps in organizational process awareness and enhances the applicability and scalability of the Riva method.

The KLC-RBPA model encompasses the processes of exploration and identification, which align with Riva's first step. Subsequently, capturing and refinement correspond to steps two and three, while creation and exploitation align with steps four, five, and six. A novel step has been introduced to the Riva method, reflected in the KLC-RBPA model. This step involves sharing the Riva BPA diagrams and elements with members of the organization and is defined as knowledge processes of sharing and dissemination. Domain experts evaluated the KLC-RBPA model and agreed on the appropriate adaptation of Riva steps by the selected knowledge processes. Results also reported a relationship among these model phases and a clear positive linear correlation between knowledge sharing and dissemination and knowledge creation and exploitation phases.

Future work includes conducting real-world case studies to validate the KLC-RBPA model's applicability in various industries and assess its effectiveness in implementing Riva BPA steps. Further studies could include mapping KMPs to other business process modeling frameworks and evaluating their roles in enhancing organizational performance.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work the author used Grammarly in order to improve readability and language of the manuscript. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

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Conflict of Interest

The author has no conflicts of interest to declare

APPENDIX

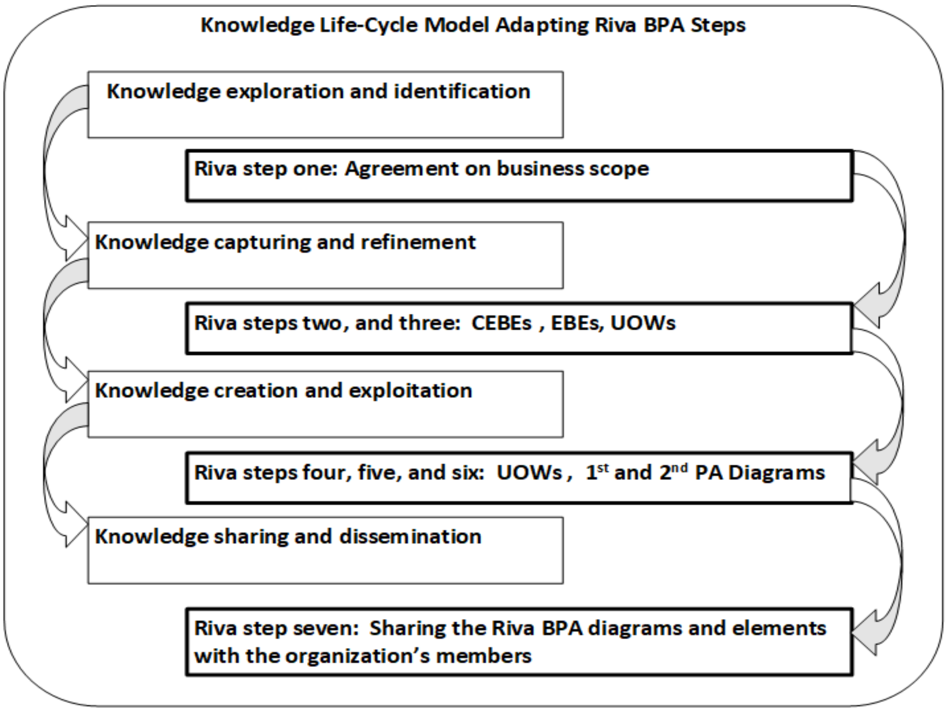

Fig. 1: A life-cycle model of knowledge adapting Riva BPA (KLC-RBPA model)