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A Stage Model of Organizational Knowledge Management: A Latent Content Analysis†

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조직의 지식경영 단계모델 : 잠재내용 분석관점

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This study developed an integrated management framework for KM, consisting of four major management objects and organizational initiatives: managerial and technical initiatives. Based on the developed framework, it proposes a stage model of organizational KM from Initiation, Propagation, Integration to Networking stage with detail explanations focusing on management goals and activities. To validate the proposed stage model, this study conducted a preliminary study with a latent content analysis of 15 KM cases. Form the results, though is could not validate the time sequence of each stage because of the limited information of cases, it shows meaningful findings in that there are a kind of relationship among management goals, activities and characteristics of management object of cases.

1. Introduction

The recent rapidly flourishing interests on KM (KM) have leaded to a lot of organizational initiatives in the real business. The typical approaches of those initiatives are using information technologies for their organizational KM (Daverport & Prusak, 1998; O'Leary, 1998; Ruggles, 1998). On the other hand, the recent theoretical developments in KM literature have produced various knowledge- related constructs and management frameworks.

However, there are still no common agreements on both how to understand and predict the futures of KM among theorists and how to manage organizational initiatives among practitioners. Therefore, this study develops an integrated framework and proposes a stage model of organizational KM based on the framework.

To develop an integrated management framework consisting of management objects and organizational approaches, we first redefine the organizational capability by reviewing diverse perspectives of major theoretical streams in KM literatures. After that, we developed an integrated management framework of KM. To provide practical implications for organizational managers, a stage model of KM will be also suggested with a detail description of each stage.

To validate the suggested stage model, a latent content analysis is conducted as a preliminary study of 15 cases with developed checklists of management goals, organizational actions and management objects of each stage.

2. Organizational Capability in KM

In the traditional approach, the attractiveness of an industry and its establishment of competitive advantage over rivals are major questions of organizational capability of competition (Collis & Montgomery, 1995). With an increasing uncertainty and dynamics of business environments, a resource-based view of

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firm has suggested organizational resources and capabilities as key success factors for a competitive advantage and its sustainability (Barney 1993; Peteraf 1993). Later, this perspective has approached by developing a dynamic capability of managing organizational knowledge to match the requirements of the changing environment (Teece, 1993).

The research interest on organizational capabilities has been recently revitalized by the knowledge-based theories (Kogut & Zander, '92; Quinn *et al.* '96; Grant, '96a; Spender, 1994). This perspective argues that organizational knowledge such as operational routines, skills or know-how are the most valuable resources and its strategic management capability is a key strategic factor under more dynamic and rapidly changing environment.

With the knowledge-based perspective, many scholars define different types of organizational capabilities as key sources of competitive advantage as in the table 1. From the definitions of each theorists, we can deduce the following implications. First, organizations can not only acquire their needed knowledge and related objects externally but also build them themselves internally (Cohen & Levinthal, 1996; Kogut & Zander, 1992). Second, the final goals of KM is to get competitive advantages and sustain them by producing new products or service or enhancing organizational processes in terms of speed, quality and costs (Junarkar, 1997; Quinn *et al.*, 1996). Therefore, organizations should integrate and leverage their knowledge for the final goals. Third, the definition has a dynamic view of organizational capabilities (Teece *et al.*, 1997), in that KM is a continuous managerial activity according to the changes of market needs (Quintas, 1997). Forth, KM is not a simple management framework of organizational knowledge itself but a management paradigm shift requiring the involvement of other organizational factors such as organizational structure, culture, knowledge worker, information technologies, etc (Grant, 1996; Nonaka, 1994; Tsoukas, 1996).

Therefore, we can conclude that the organizational capability in KM is dependent on organizational abilities to acquire or create, integrate, leverage and reconfigure knowledge and its related objects resulting into organizational performances.

Table 1. Organizational capability in KM literatures

Theorists	Definitions of organizational capability	Core Competency
Grant ('96)	Organizational capability as the knowledge integration and its ability to perform repeatedly a productive task for creating values on its outputs.	Integration Capability
Kogut & Zander ('92)	Organizational ability to learn new skills from the combination of internal and external learning.	Combination Capability
Cohen & Levinthal ('96)	An absorptive capability as an organization's ability to recognize the value of new, external information, assimilate it, and apply it to commercial ends for organizational innovative capabilities.	Absorptive Capability
Nonaka ('94)	The creation capability of knowledge by introducing the knowledge conversion model and the spiral model.	Knowledge Creation Capability
Junarkar ('97); Quinn et al.('96)	Organizational leveraging capability of managing organizational knowledge according to the changes of environment with a dynamic perspective.	Leveraging Capability
Badaracco ('91)	Organizational ability to learn or acquire its needed knowledge from other organizations	Knowledge Link Capability

3. KM Framework

The current growing organizational initiatives around the four major objects (Lee & Kim, 1999)- organizational knowledge, knowledge worker, KM process and information technologies- can be explained with an integrated framework as in figure 2. The KM can be approach in managerial approaches and technical approaches. The prestigious managerial actions to motivate knowledge workers are leaderships, empowerment, performance measurement and rewards, flexible organizational structure, knowledge-friendly organizational culture management. To facilitate the KM process, organizations would define procedures and rules of the process and, if necessary, make a team to facilitate and manage it. For knowledge workers, organizations can make a training or education program to increase the knowledge capability of individual knowledge workers. As managerial efforts for knowledge itself, many organizations have already their own knowledge typologies for their focused and systematic management of organizational knowledge content (Wiig, 1995). Most organiza-

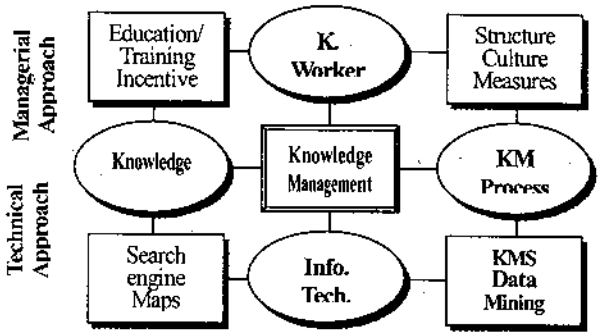

Figure 1. Objects and Organizational Approaches.

tions have also already or are under developing a knowledge repositories with search engines, index and directory services or KM system with diverse communications channels, knowledge editor/viewer and sometimes knowledge discovery tools like Data Mining tools (O' Leary, 1998; Ruggles, 1998).

4. A Stage Model for Organizational Knowledge Management

As organizations adapt KM with the discussed framework, the maturity progress of organizational KM can be explained with four stages; Initiation, Propagation, Integration, Networking (Figure 2).

The overall progress of stages is based on the life cycle theories adapting the metaphor organic growth as a heuristic device to explain the changes of organizational behaviors and its progression as a process (Van de Ven, 1995). However the model has the external integration stage instead of the termination because the KM is a continuous management issue according to the environmental changes (Demarst, 1997; Grant, 1996).

Each stage of KM can be explained by applying a teleology that views organizational developments and changes as a cycle of goal formulation, implementation, evaluation, and modification of goals based on what was learned by the entity (Van de Ven, 1995).

As proceeding from the initiation to the networking stage, the management goals will change from the initial preparation of enterprise-wide efforts for KM to external networking, and the managerial actions will also change to follow the management focuses. The organizational capability of KM, including both the absolute amount and strategic value of organizational knowledge and its related activities, becomes increased as proceeding stage by stage like Nolan's stage model (Gibson & Nolan, 1974).

The characteristics of management objects in each stage will also be changed as you can see in table1. The types of organizational knowledge in each stage will be change from existing knowledge to internally integrated and externally networked knowledge. The roles of knowledge workers will be also changed from a knowledge absorber to knowledge coordinator. While the knowledge expert is a knowledge worker who has deep knowledge in his specialized area, the knowledge coordinator is a knowledge expert as well as knowledge broker who has broad knowledge relationship. Additionally, the focused activity and application range of KM process will be

	Initiation	Propagation	Integration	Networking
Goals	Preparation for Enterprise-wide KM efforts	Expansion of KM efforts enterprise-widely	Integration of KM efforts to outputs	Extension of KM efforts to outsides
Organizational Actions	• Get top management's supports • Get strong commitments from employees' • Make a long-term master plan and acquire needed resources • Conduct benchmarks or a pilot project	• Build and apply organizational infrastructures(policies & rules, etc.) enterprise-widely • Make a complete KM process including a team, policies/rules, measurements • Set up an organizational knowledge typology • Design and implement technical infrastructures	• Scan & analysis market needs actively • Monitor & control to integrate and leverage knowledge and its related activities • Change knowledge infrastructures.(organizational & technical) to align with performances • Evaluate a KM performance based on its effectiveness	• Scan & seek proper knowledge partners • Make knowledge alliances with partners • Link knowledge infrastructure to partners • Facilitate & manage inter-organizational knowledge sharing and collaborations

Figure 2. Stages of organizational KM development.

Table 2. KM stages and Object characteristics

	Initiation	Propagation	Integration	Networking
Org'l K.	• Acquired Knowledge	• Created Knowledge	• Integrated Knowledge	• Networked Knowledge
K. Worker	• Knowledge absorber	• Knowledge creator	• Knowledge expert	• Knowledge coordinator
KM process	• Acquisition	• Creation	• Internal sharing	• Global sharing
IT system	• Closed	• Isolated	• Enterprise	• Global

also changed from knowledge acquisition to global sharing. The knowledge management system will be also changed from the closed system to the global system. The closed system is a stand-alone system that is typically used in small part of organization without connecting to other systems. However, the global system is a knowledge sharing system that all authorized individuals can access easily at any time and place.

4.1 Initiation Stage

The first stage is an initiation stage in which organizations start to recognize the importance of organizational KM as critical competencies for their sustainable competitive advantage and prepare for the enterprise-wide KM efforts. It is typically enforced by environmental pressures explained with rapidly changing socioeconomic and technical factors, globally increasing competition and changing customer demands for knowledge-intensive products or services (Demarst, 1997).

The major issue of strategic management in this stage will be how to make its organization prepare for KM initiatives. Many scholars recommend that organizational strategic change is generally realizable when organizational collaboration and strong commitments from all organizational members are acquired (Ichijo *et al.*, 1998; Kanter, 1984). Especially, KM is a social activity requiring the voluntary involvement of individuals (Nonaka, 1994; Ichijo *et al.*, 1998). A strong commitment and voluntary involvement of organizational members can be acquired when they share the same vision and goals (Kanter, 1984). Consequently, organizations should clearly specify shared visions or goals of KM and disseminated them over their whole organization through diverse communication channels.

KM is not an easy task requiring a long-term time period and a lot of organizational resources such as human power, capital and managerial efforts (Davernport & Prusak, 1998). Therefore, after getting organizational supports and commitments, organizations should make a strategic plan for organizational change into a KM paradigm. To get enough information or experiences, doing benchmarks or pilot projects are recommendable ways before the enterprise-wide efforts (Davenrport & Prusak, 1998).

4.2 Propagation Stage

The propagation stage is a stage where organizations provide the opportunities and means for a wide variety of knowledge related activities by developing knowledge infrastructures. In this stage, the level of KM activities such as creating, sharing, storing and using is rapidly increasing over all organizational areas.

In the early part of this stage, organizations build knowledge infrastructures, both organizational infrastructures and technical infrastructures (Tobin, 1998). Additionally, a complete KM process will be also defined and applied enterprise-widely at this stage to facilitate KM activities. An integrated organizational typology of knowledge is also created in this stage. The typology of organizational knowledge in this stage will be relatively huge and complex to cover all subject areas of existing and newly created knowledge.

Building technical infrastructures implies using information technologies, especially communication and database technologies, to facilitate and support KM activities. Most popular and common approach is implementing any kind of KM systems or knowledge repository systems in the field (O'Leary, 1998; Ruggles, 1998).

4.3 Integration Stage

The integration stage is a stage where organizational knowledge activities are institutionalized as daily activities over the whole organization. However, despite of accumulated organizational knowledge and its related activities, many organizations will face a serious problem in that they can not add values on their products or services. This is because that organizational knowledge is not integrated and leveraged to the market requirements (Quinn *et al.*, 1996; Grant, 1996a; 1996b).

The key management concerns of this stage are how to integrate diverse and distributed organizational knowledge and leverage them to organizational products, services, or processes. Additionally, as organizational environment changes, the required knowledge will be also changed. Therefore, organizations should continuously monitor, control and manage their organizational knowledge and its related activities to keep their product or services to the market requirements (Wiig, 1995).

4.4 Networking Stage

The final stage is an external integration stage where organizational knowledge is networked not only within an organization but also with external entities such as research centers, universities, suppliers, and customers. As more organizations come to participate in KM competition, the sustainability of competitive advantage from KM become harder to come by. Generally, becoming more severe competition, organizations usually concentrate its own resources and executive time on those few activities, core activities where it can perform at the best-in-the-world levels (Quinn *et al*, 1996). For the maximum effect of KM, organizations in this stage also will start to focus their organizational efforts on specialized core knowledge and outsource other needed knowledge from outside. Many scholars also found learning or knowledge acquisitions as one of the major motives of strategic alliances (Badaracco, 1991; Baker, 1994; Mowery, 1996; Pucit, 1988).

However, the knowledge transfer among different organizations, called market-based knowledge by Grant(1996), is not an easy task (Badaracco, 1991). According to Nonaka(1995), the knowledge creation and transfer is based on organizational context so that knowledge, especially for tacit knowledge, can not easily created and transferred among organizations with different cultures, structures, and goals. Therfore, the key management issue of this stage will be how to facilitate and manage the knowledge alliances.

For the successful knowledge alliances, there may be a lot of managerial condition such as clear visions and goals, a wide range of possible alliances, collaborative activities, shared goals, trust-based relationship and so on (Badaracco, 1991). The first actions by organizations are to find and evaluate a partner, and then make the form of the relationship. According to Badaracco (1991), the partnerships through alliances for knowledge sharing should be based on a trust-based relationship. Therefore, organizations should manage their alliance based on a trust-based relationship not only through diverse communications but also formally specified policies and rules.

Additionally, there must be other managerial efforts to make the alliances effective. For example, they should motivate each partner's members by extending their performance measurements and reward systems and the scope of personnel rotations to partner's. It will also be better for knowledge sharing among alliances to extend the managerial and application range of existing infrastructures such as KM process, knowledge repository system, KM system.

5. A Preliminary Study: A Latent Content Analysis of Cases

Many literatures have validated their stage models of organizational development and changes by testing the antecedents and consequences of strategic changes (Miller & Frisen, 1984). While some of them utilized large samples and statistical methods, others did in-depth case studies spanning several years. Both methodological approaches of studies in organizational change theories are mostly focused on organizational events or strategic actions (Rajagopalan, 1996; Van de Ven, 1995). Therefore, we tested the suggested stage model with multiple cases as a preliminary empirical study by checking organizational management goals and its managerial actions for KM with several case reports.

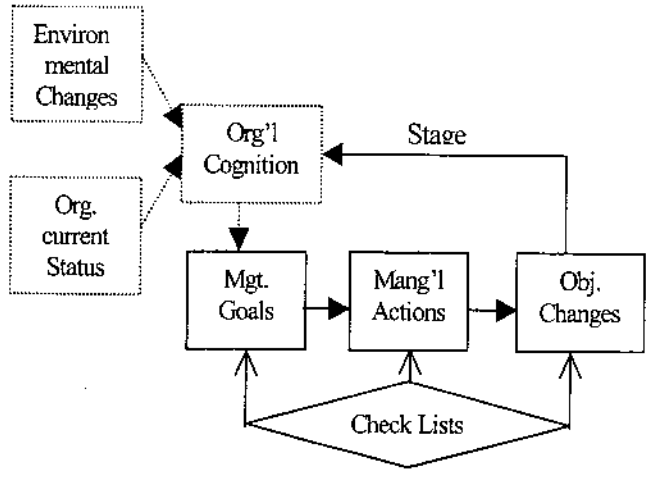

Figure 3. A research model for validation.

As you can see in the figure 3, the research framework is based on an assumption that the changes in management goals are caused from the organizational recognition of environmental changes and its current status of organizational resources. The organizational cognition will effect on the changes of management goals. Based on their management goals, organizations will do different managerial actions to align their strategic goals with environmental needs (Rajagopalan, 1996). Consequently, the characteristics of management objects will be changed by the managerial actions. Based on this research framework, we developed checklists of each stage to find out which stage an organization is in.

The validation focuses on management goals, managerial actions, and characteristics of management objects with secondary data because of difficulties to collect large samples with enough information covering all stages for an empirical study. If empirically supported, the suggested stage model would constitute distinct contexts for managerial focuses and managerial actions.

For the preliminary empirical study, we developed the following propositions.

Proposition 1: There may be a time sequence among stages from initiation to networking stage

Proposition 2: The managerial goal of KM will be highly related with the checklists of managerial actions in the same and previous stage

Proposition 3: The managerial actions will be highly related with the changes in characteristics of management object.

5.1 Methodology and sample

We did a content analysis for the preliminary empirical study with secondary data. The content analysis is a research method of studying communications in a systematic, objective, and quantitative manner to measure variables of interests (Kerlinger, 1973). It is generally applied to available materials as sources of research data, especially produced for particular research problem.

The examples of materials used in the content analysis can be documents such as letters, diaries, newspaper articles and editorials, and minutes of meetings. Therefore, we collect 6 domestic and 9 other advanced country' cases as materials for the content analysis. The domestic cases are from KM reports required for the certification of a training in the Chief Knowledge Officer education program of Korea Advanced Institution of Science and Technology in both 1998 and 1999. The advanced 9 cases are collected from Harvard Business School Publications, other articles or papers, and sometimes from Internet web sites such as Ernst & Young and APQC.

Though we found a lot of cases, we select the 16 cases based on the quality of cases' contents by examining whether a case is covering all enterprise-wide efforts for KM. The selected cases are consisted of 3 consulting service companies, 2 financial institutes, 3 chemical industries, 1 department store, 6 manufacturing companies

5.2 Data Analysis and Evaluation

The materials of a content analysis can be analyzed by investigators based on either manifest or latent content (Babbie, 1992). While the manifest content analysis is to count systematically the number of the visible and surface content, the latent content analysis is to find its underlying meaning of a content. We did a latent analysis because the cases are written with different purposes and perspective by different authors, and furthermore, the focused areas of each case are different.

To minimize the evaluation variations, we developed the checklist of organizational actions in each stage like the appendix A, B and C developed from two-rounds of expert evaluations and several rounds of discussion with KM study members in KAIST.

We checked the current status of organizational KM for each case. To increase the correctness and completeness of information provided by cases, we checked each case with deep discussions of the meanings of each key sentences and sometime visiting their wed sites. For managerial actions, if a case get score higher than 70% of the checklists, we proceeded to the next stage.

6. Results and Discussion

6.1 Time sequence of stages

The time sequence of stages has not been clearly founded in this study. We assume that it is because some cases are not written based on the longitudinal approach and in detail enough to configure all event

based the time sequence.

However, fortunately, we found that the case of McKinsey & Company was perfectly matched with the sequence we proposed. For example, though McKinsey & Company had always shown its managerial interests on consultants and their knowledge since its establishment in 1957, the real enterprise-wide efforts had been started after the Commission on Firm Aims and Goals was reported in 1971. Up to the early 1980s, McKinsey had prepared its real organizational efforts of KM by training consultants' skills and expertise and defining the Clientele Sectors and Center of Competence.

The enterprise-wide KM effort in McKinsey was launched in 1987. After five months of an internal study, it decided to build a common database of knowledge, to hire a full time practice coordinator, to expand its hiring practices and promotion policies to create a career path for deep functional specialists. Accordingly, McKinsey not only developed the information systems such as Firm Practice Information System (FPIS), Practice Development Network (PDNet) and Knowledge Resource Directory (KRD) but also legitimized the role of a new class of consultants-the specialist by emphasizing specialized knowledge development. The organizational efforts of this period, called 'let 1,00 flowers bloom', had resulted in the original group of 11 sectors and 15 centers expanding to "72 islands of activity".

However, Ted Hall, a Management Director of Clientele and Professional Development(CPDC) recognized that there was a need to adjust the firm's knowledge development focus in 1991. Accordingly, the CPDC began integrating the diverse groups into seven sectors and seven functional capability groups led by teams of five to seven partners. Finally, McKinsey began to focus on a new theme-client impact and created a Client Impact Committee. It also developed multiple career paths for engagement directors and practice coordinators. Now, McKinsey has a global practice formal and informal network linked to not only global offices and external resources such as MIT's Multimedia Lab., Theseus Institute, etc.

6.2 Management Goals, Managerial Actions and changes of management object

The relationship of management goals, managerial actions and the changes of management object are shown in table 1. The numbers of each shell in the columns of managerial actions are the total numbers of checked checklists of each stage. The words of each row in the columns of management actions and characteristics of management objects stand for the current status or progress of each case. However, there are several shells denoted as 'N/A' that we can not find any information from the analysis.

Most organizations with management goal in each stage also have managerial actions of the same stage. For example, the management goal of 'AC-1' case is

Table 3. Relationship among Goals, Actions, and Characteristics of Objects

Cases	Mgt Goals	Managerial Actions				Characteristics of Management Objects			
		S1(10)	S2(12)	S3(9)	S4(12)	Org'l K.	K. Worker	Focused Act.	IT
A-1	Networking	9	11	8	4	Networked	Coordinator	Global Sharing	Global
A-2	Integration	7	10	4	-	Core	Specialist	Internal Sharing	Enterprise
A-3	Networking	10	10	8	6	Networked	Specialist	Global Sharing	Global
A-1	Networking	9	11	8	5	Networked	N/A	Internal Sharing	Global
A-1	Integration	8	9	6	-	N/A	N/A	Creation	Enterprise
A-6	Propagation	7	10	3	-	Created	Creator	Creation	Enterprise
A-2	Integration	8	9	8	1	Core	Creator	Internal Sharing	Enterprise
A-8	Propagation	7	7	-	-	N/A	Creator	Creation	N/A
A-9	Integration	8	10	6	-	Core	Specialist	Internal Sharing	Enterprise
K-1	Propagation	7	8	-	-	Created	Creator	Creation	Closed
K-1	Propagation	8	10	1	-	Created	Creator	Creation	Closed
K-3	Initiation	5	-	-	-	Existing	Learner	Acquisition	N/A
K-1	Propagation	7	8	-	-	Created	Creator	Creation	Isolated
K-4	Propagation	7	2	-	-	Created	Creator	Creation	Isolated
K-1	Initiation	3	-	-	-	N/A	N/A	Acquisition	Isolated

checked as 'networking stage' and the checked score of managerial actions are relatively high score up to the integration stage. That is, the score of 'integration stage' is over the 70% of total score (12) but low (4) in 'networking' stage, matching with the previous stage of management goals. Additionally, most of the characteristics of management objects are also matched with the current stage of managerial actions. Therefore, we can say that this case is in early 'networking' stage. However, there are some mismatches in the characteristics of management objects. For example, even though the current stage of 'A-3' case is a networking stage, the characteristic status of knowledge worker is still 'specialist' matched with that of the integration stage. This is, we assume, because that the information from the case is not perfect.

7. Conclusion

This study proposed an integrated management framework including management objects and organizational initiatives. It also proposed a stage model of organizational KM from broad literature reviews and case studies. To validate the suggested models, we did a preliminary empirical study by applying a latent content analysis with several secondary data, published or announced cases. To minimize the variation risk of evaluation, we developed the checklists of management goals, managerial actions and characteristics of management objects in each stage.

From the test, we concluded that there was a time sequence in the adaptation of KM by organization. Additionally, each stage can be identified with management goals and its managerial actions generally. However, it was difficult to find significant changes in the characteristics of management objects according to development of KM stages. We assumed that this result is caused by insufficient information from the cases with different purposes and authors. However, we expect that it can pave the way for theorists to extend their theories with the integrated management framework and, with the stage model and its checklists, for practitioners to give helpful guidelines for their organizational initiatives from this study.

This study like other studies, has also some limitations to be solved. First, the suggested model was validated with a preliminary empirical study, a latent content analysis. Therefore, more solid empirical validations such as a cross-sectional survey study and a detail and longitudinal case study should be conducted. Second, this study used the secondary data produced with different purposes and authors. Consequently, there may be a possible sample biases. Third, though we use the checklists and several rounds of discussions for the evaluation, there is still a possibility of involving investigator's personal subjectivity.

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Appendix: Checklists

The checklists are not attached in this paper because of the page limitation. If you need, contact authors.

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