

# MAT: A Design Framework for Integrating Knowledge Map and Business Model

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## Abstract

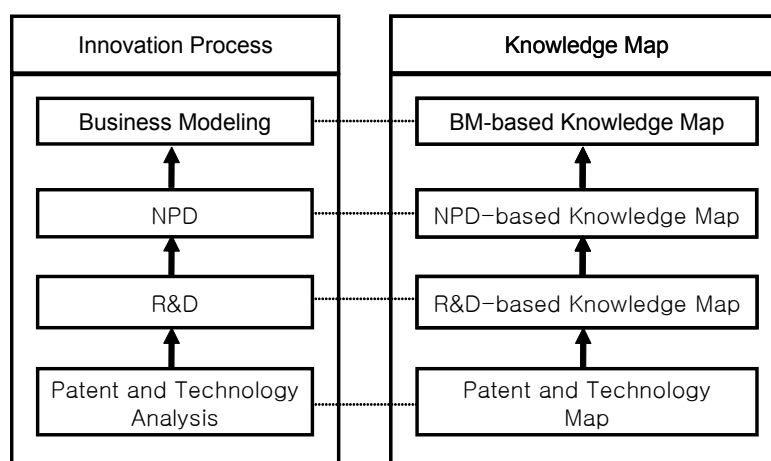
To support managerial decision-making is considered as one of the most important roles of knowledge management (KM). Among others, decisions on business model (BM), encompassing the structure, function, and mode of business, accounts for the primary interest of corporations. In this respect, it is necessary to incorporate BM into KM to support decision-making. Despite the strategic importance, previous research on KM has paid little attention to this issue. This paper represents an exploratory attempt to integrate BM and KM. To this end, we propose a framework for developing knowledge map based on BM. Knowledge map is a representation tool to visualize knowledge sources and relationships among knowledge artifacts. Thus, knowledge map serves as the backbone of knowledge management system (KMS). BM-based knowledge map assists business managers in grasping and capturing knowledge source and knowledge artifacts needed to design and implement a business. Broadly, the proposed knowledge map comprises three layers, market, actor, and transaction. These layers are related in a hierarchical way, together forming a structural framework coined as MAT.

## 1. Introduction

Recently, *knowledge management* (KM) has attracted increasing attention from both academicians and practitioners alike. While KM represents the conceptual notion and managerial discipline, *Knowledge management system* (KMS) accounts for the driving engine and practical tool of KM that actually facilitates knowledge generation, dissemination, and utilization [6][7][9]. Since KMS is a large-scale, complex system, it is not uncommon that *knowledge map* is employed as the building block for designing KMS. Knowledge map is defined as a representation tool to visualize knowledge sources and identify relationships among knowledge artifacts. Although the utility has long been recognized, only a paucity of studies dealt with knowledge map thus far. Furthermore, previous research has mainly made from the perspective of system developers, rather than of knowledge users [1][3][4].

Recognizing that the ultimate goal of KM is to innovate business system and to obtain managerial knowledge for strategic decision-making, it is now imperative to develop knowledge map that facilitates business innovation. Although this research issue is rather brand-new, a few pioneering researchers have already made some contributions. To illustrate, Eriksson [2] and Gorddijan [5] suggested business modeling framework based on unified modeling language (UML), a generic software engineering tool. Levine [8] proposed an approach based on contract (ABC) method, in which the contract between firm and its client is used as the base of business and knowledge modeling. These frameworks, albeit useful and meaningful, are limited to designing internal process of business and thus are not sufficient to integrate business modeling and knowledge management in a global context.

In this research, we propose that business innovation process of a firm be composed of several phases: patent and technology analysis, research and development (R&D), new product development (NPD), and business modeling (BM). Accordingly, for each phase, corresponding knowledge map is required. Specifically, as shown in Figure 1, patent/technology map, R&D-based map, NPD-based map, and BM-based map are suggested. Among others, we focus

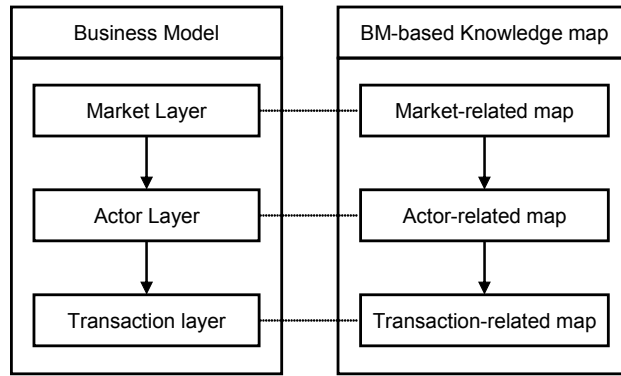


on BM-based map in the current research. *Business model* is defined as an abstraction of how the market is structured, what players are involved, and how actual transactions are made in doing business [2]. Therefore, The framework for designing BM-based knowledge map consists of three layers, *market*, *actor*, and *transaction*.

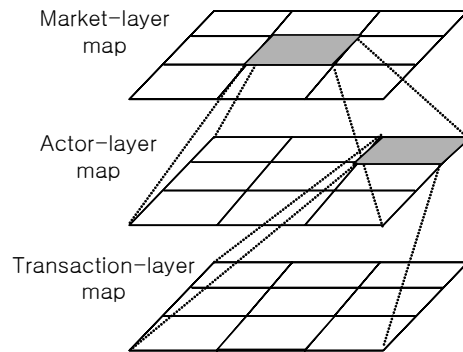
**Fig. 1 Business Innovation Process and Related Knowledge Map**

## 2. Overall Structure of Framework: MAT

In general, the construction of knowledge map comprises two major steps, identification of relevant knowledge artifacts to be included and visualization of them in a properly organized structure. In this research, we suggest *MAT* (*Market*, *Actor*, and *Transaction*) model to define and decompose a business. As mentioned before, this model is composed of three layers, market, actor, and transaction, each inter-related in a hierarchical and sequential way. At the top lies the market layer that describes market domain and market attributes. The market domain denotes market segments and/or regional areas where the commodity (service) of interest is launched. The market attributes represent detailed information that describes the nature of each market domain. Similarly, the actor layer in the middle position depicts actor domain and actor attributes. The actor domain shows the list of players who are involved in business and actor attributes provide detailed information on each actor. Finally, the transaction layer at the bottom consists of transaction domain and transaction attributes. Basically, it exhibits the process of buying and selling a specified commodity or service, the way of value transfer, and the mode of payment. Based on MAT model explained above, we suggest a multi-level, BM-based knowledge map, as shown in Figure 2 and Figure 3.



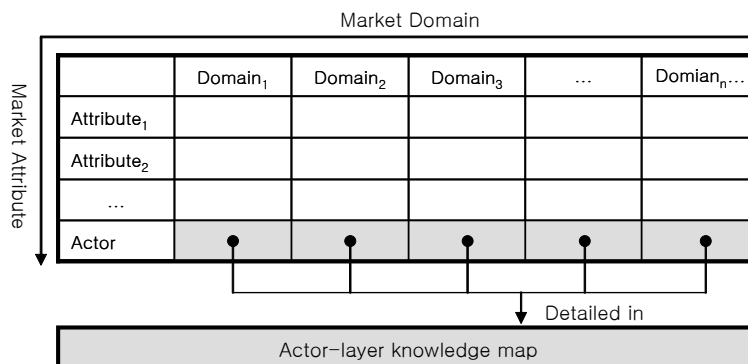
**Fig. 2 Correspondence between BM Layer and Knowledge Map Layer**



**Fig. 3 Hierarchical Linkage among Layer Maps**

## 3. Each Layer of BM-based Knowledge Map

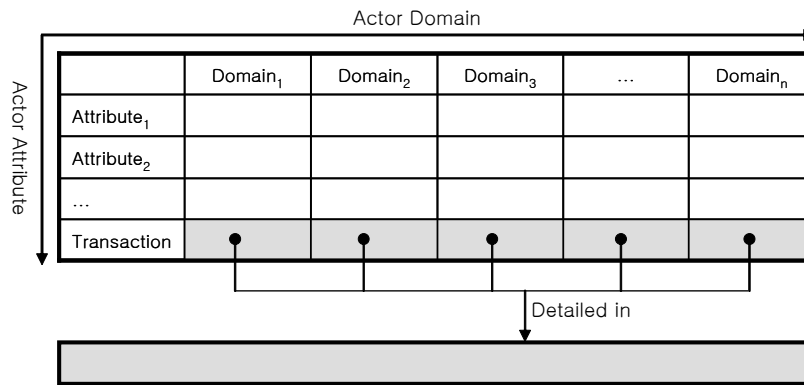
First, the market-layer knowledge map is composed of two dimensions, market domain and market attributes. The composition of market domain is user-dependent and situation-specific question. That is, it may be classified into several domains depending on such factors as geographic, industrial, demographic, and behavioral variables [9]. Market



attributes may encompass both environmental attributes and internal attributes. A typical form of market-layer knowledge map is illustrated in Figure 4.

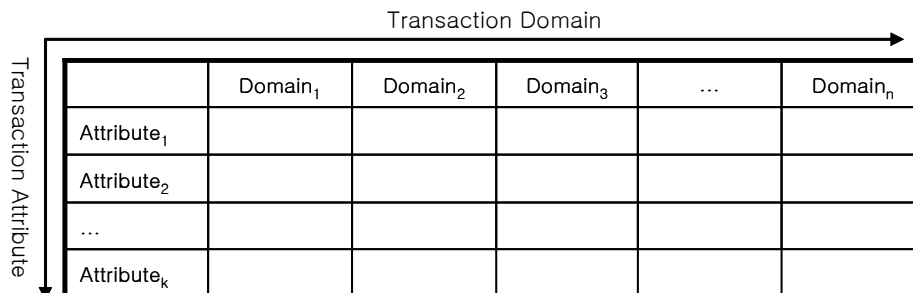
**Fig. 4 General Form of Market-layer Knowledge Map**

Second, the actor-layer knowledge map is constructed for a given market domain selected in the market-layer map. Note that these two maps are interrelated in a hierarchical way. Again, this may be composed of domain-dimension and attribute-dimension. Typically, actors may include supplier, producer, logistics, distributor, customer, agent, etc. Then, for each actor, detailed profiles are provided as attributes. Figure 5 presents an exemplary form of actor-layer knowledge map.



**Fig. 5 General Form of Actor-Layer Knowledge Map**

Finally, the transaction-layer knowledge map is developed for a given actor selected in the actor-layer map. This map also consists of two dimensions, transaction domain and transaction attributes. Figure 6 shows a general format of transaction-layer knowledge map.



**Fig. 6 General Form of Transaction-layer Knowledge Map**

#### 4. Conclusion and future study

Despite increasing interest and intensive research, both academia and practitioners of KM have paid little attention on integrating KM and BM. In this exploratory research, we suggested a framework for developing BM-based knowledge map. The underlying rationale is based on the argument that the ultimate goal of KM is not to manage knowledge management process per se but to accomplish business innovation. The proposed framework, named MAT, consists of three maps, market-layer map, actor-layer map, and transaction-layer map, which are interrelated in a hierarchical way.

In the current research, we just suggested the overall framework and general forms of respective maps. The purpose of this paper is confined to providing conceptual blueprint. Hence, it is required to elaborate detailed procedure and materialize real maps. We are now carrying out the task and the output will be presented later on.

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