

# BUILDING LOGISTICS DEVELOPMENT MODEL FOR RETAIL COMPANY BASED ON LOGISTICS MATURITY MODEL

● PHAM THI HUYEN

## ABSTRACT:

This paper is to build a logistics development model for retail companies to support them in determining the development level, thereby offering solutions for their logistics activities. The logistics development model is built on the logistics maturity model that has been announced in recent years. The logistics development model shows that there are five levels of logistics development, from the initial level (level 1) to the optimization level (level 5). Developing logistics activities at a retail company includes the following three basic contents: (1) Establishing logistics operations at a retail company, (2) Designing the logistics organization structure at retail companies, (3) Developing logistics resources at retail companies.

**Keywords:** Maturity model, logistics maturity model, logistics, development, retail.

## 1. Introduction

Theory of logistics has been relatively adequate, demonstrating the development through different approaches. By the time, logistics has undergone a robust development, from simple to complex, from fragmentation to integration, from general applications to specialized applications. Therefore, logistics has become widely concerned and innovated to optimize operations of companies around the world.

As for the retail sector, due to the significant growth in the late 20th century, large retail companies began to dominate the supply chain. As a result, logistics management has become the top concerned matters of retailing firms. Retail companies are constantly offering measures to improve and develop their logistics operations. Development of logistics activities is a change in the direction of increasing quantity and improving

in quality in order to achieve higher goals, demonstrating development to a complete level through setting, adding, transforming and improving existing logistics operations, physical factors and logistics organization at retail companies. Therefore, to improve logistics, retailers need to evaluate the current level of logistics development. However, the assessment of logistics development in retail companies is very limited.

For those reasons, the article will build a logistics development model for retail companies to support them in determining the level of development, from which to offer suitable solutions for their logistics activities. The logistics development model is based on the logistics maturity model that has been announced in recent years. Maturity model is a common tool for describing typical behaviors demonstrated by a

company or organization at different levels of maturity/development. Maturity shows development to the fullness, imparting the idea of development from the initial state to the optimal state. With maturity models, a company can classify their current stage of maturity while also progressing to a higher maturity stage.

The article is structured into 5 sections, including: Section 1 outlines the necessity to build a logistics development model for retail companies; Section 2 presents an overview of maturity models; Section 3 introduces some published logistics maturity models; Section 4 presents main issues related to building logistics development models for retail companies; Finally, Section 5 summarizes the research with limitations and offers some recommendations for the next study.

## **2. Maturity model: an overview**

Maturity models are common tool for describing typical behaviors demonstrated by a company or organization at different levels of maturity/development (Battista et al., 2012). Maturity shows development to the fullness, imparting the idea of development from the initial state to the optimal state. Therefore, the maturity models are defined as a series of sequential levels, which together form a path from the initial state to the final state of maturity. It is critical to define each stage on this path as well as specific requirements, and to define the relationship between them. With maturity models, the company can identify their current stage of maturity while also progressing to higher maturity stages.

Maturation methods are derived from the field of quality management. One of the earliest approaches is Crosby's Quality Management Maturity Grid, which describes the typical behavior demonstrated by a company at five levels of maturity across six aspects of quality management. In 1993, the Software Engineering Institute (SEI) of Carnegie Mellon University, Pittsburgh (USA) planned the first maturity model called Capability Maturity Model (CMM), developing a standard process for assessing the quality level of information technology organizations, through an analysis of the performance levels of software development processes (Turner R, Jain A., 2002). Then, in 2000, CMM was upgraded to Capability Maturity Model Integration (CMMI). CMMI is used to guide process improvement in a project, a

part or the whole organization. CMMI's success has inspired the development of many maturity models in different fields, including logistics.

Although the number of maturity models is increasing, the number of logistics maturity models is quite limited. The first logistics maturity model was established by USA Research Institute in 2006, which determined a Logistics Maturity Pyramid for research on maturity of American Government Agencies, described by Reay et al (2006). The next logistics maturity model was developed by Italian authors C. Battista, A. Fumi, M. M. Schiraldi (Battista et al., 2012,2013). They conducted research on the application of logistics maturity models in the fashion industry. In 2018, Karolina Werner-Lewandowska and Monika Kosacka-Olejniak developed a logistics maturity model for service companies.

## **3. Previously developed logistics maturity model**

### *Model 1. The model was developed by Battista et al*

This model was built for companies in the industry, focusing on business logistics processes, which are useful for planning, managing and inspecting the flow of raw materials, finished products and their information flows from origin to consumers.

The logistics maturity model (LMM) operates similarly to the capability maturity model (CMM) but focuses on logistics. In the LMM, four logistics areas (LA) are defined based on SCOR (in which reverse logistics is not considered), including: plan, purchase (source), make and delivery. Each area is divided into several subprocesses/processes.

The LMM is based on the 5-level maturity ladder: from the unstructured initial level (level 1) to the optimization level (level 5), according to the standard recognized in the Maturity Models, including (Figure 1):

Level 1: an acknowledged business need but unregulated (unstructured) related processes;

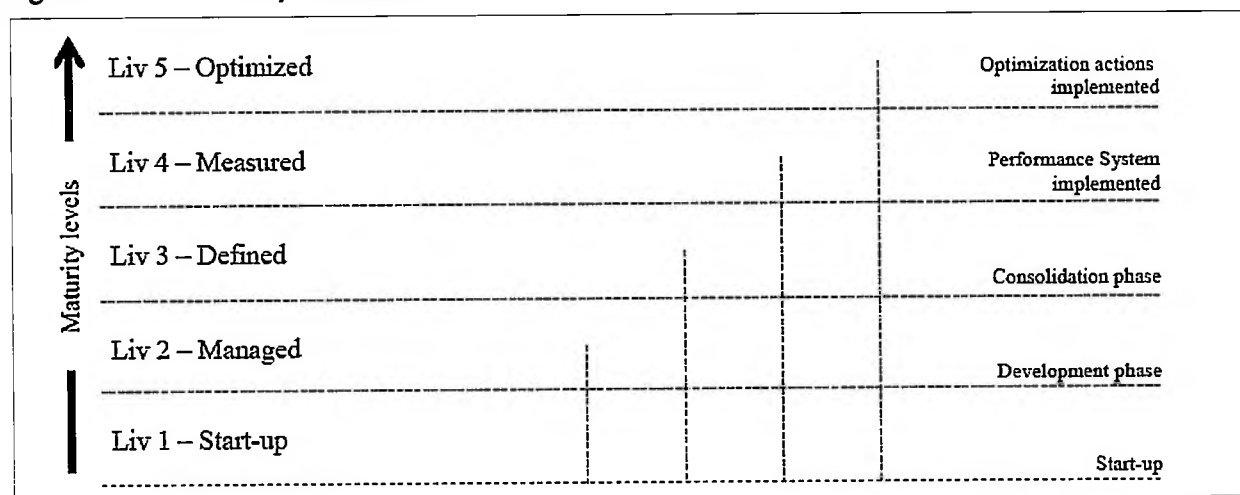
Level 2: a regulated process but it is not formalized or standardized;

Level 3: a process is formalized and standardized, but it is neither controlled nor supervised;

Level 4: a process is controlled and monitored but not optimized;

Level 5: an optimized process.

Figure 1: LMM Maturity Framework



(Source: Battista et al, 2012)

Each maturity level is related to a set of achievements (AC). To measure the maturity of a company (i.e., to find its maturity profile), the percentage of achievement (i.e. maturity score) of each logistics area/process at each maturity level is calculated. LMM presents a total of 249 Achievements, 46 Performance Indicators, 27 Achievements Indicators, 53 Key Performance Indicators and 252 Best Practices.

**Model 2. The model was developed by Karolina Werner-Lewandowska and Monika Kosacka-Olejnik**

This is the logistics maturity model for service businesses (LMMSE), built on three pillars: the development stages of logistics and supply chain, SCOR model and logistics tools.

In the LMMSE model, five logistics areas are

defined based on the SCOR model, including: plan, purchase (source), inventory (make), distribution (delivery) and reverse (return).

Based on the research results of the development (evolution) stages of logistics and supply chain by Ronald H, Ballou, six phases of logistics development are proposed (Table 1). In which two phases 5 and 6 were added. Phase P5 related to the Internet and its accessibility, is seen as the result of finding a solution to reduce the operating costs of the logistics process. Phase P6 declared an unknown future for the current context, is due to the development of automation and robotics in the era of Industry 4.0. Although many manufacturing companies have reached this stage, it has yet to be widely adopted due to the high cost of automation and robotics.

Table 1. Phases of evaluation of logistic

Phase	P1	P2	P3	P4	P5	P6
Period of time	to 1960s	to 1980s	1990s	2000s	21 <sup>st</sup> century	Unknown future
Feature	Fragmentation	Consolidation	Functional Integration	Value adding	Network Globalization	Automation
Typical activities	Demand Forecasting Requirements Planning Sourcing/Purchasing Warehousing Inventory Manufacturing Inventory Material Handling Packaging Distribution Planning Customer Service Transport Order Processing	Materials Management Manufacturing Inventory Warehousing Inventory Packaging Physical distribution	Logistics management 3PL BRP	SCM 4PL Eco logistics Sustainability	Lean SCM SCN GSC e-commerce	4.0 Industry IoT

(Source: Ronald H. Ballou, 2007)

LMMSE assumes that the level of logistics maturity achieved by a service company depends on the evolutionary stages of logistics. However, to prove which stage the company is in, measurement is necessary. Therefore, the authors built a performance measurement system based on the use of logistic tools, known and widely used in manufacturing enterprises (best practice). Based on a list of the 90 most popular logistic tools suggested by G. Richards, S. Grinstead, the authors selected those deemed suitable for the service industry and added a few more. The result is a list of 81 logistics tools that have been created, recognized as suitable for the implementation of the logistics process in a service enterprise (Table 2).

**Table 2. Logistics tools for LMMSE**

Group of logistics tools for LMMSE	Number of tools
01 Warehouse management (WM)	15
02 Transport management tools (TM)	6
03 Inventory management tools (IM)	18
04 Supply chain management tools (SCM)	11
05 General management tools (M)	7
06 Performance management tools (PM)	6
07 Financial management tools and ratios (FM)	2
08 Problem-solving tools (PS)	4
09 IT tools (IT)	12
10 Eco-tools (ECO)	N.A.
<b>Total</b>	<b>81</b>

(Source: Karolina W. Lewandowska and Monika K. Olejnik, 2018)

**Model 3**

Model developed by LMI - a nonprofit organization that provides practical solutions for government authority. The model is built on the capability maturity model (CMM) and proposed for the federal civilian agency. The scope of logistics functions included in the model has been determined based on logistics processes in both the private and public sectors.

The model identifies six basic components of logistics maturity, including: Vision and Strategy, Organization and Workforce, Resources, Technology Support Tools, Logistics Process, Performance.

For the purposes of assessing logistics maturity

in government agencies, the research developed descriptions of the five levels of maturity.

Level 1. Organizations rarely provide a stable environment. Processes are being performed, but are not aligned with the company's goals and objectives.

Level 2. The organization's logistics components are planned, documented, implemented, monitored, and controlled at the project and process level.

Level 3. Logistics components are designed from the standard process and related assets to suit the circumstances under which they will be executed.

Level 4. Organizations that reach level 4 maturity are managing logistics components by using other statistical and quantitative techniques.

Level 5. An organization has met all of the maturity level goals. The logistics components are fully integrated and continuously improved.

To evaluate the logistics maturity of an organization, the research team conducted a survey with a questionnaire consisting of 173 questions covering all components of the maturity model. Each question has five answers. Responses ranged from A to E, with answer A relating to the highest maturity level and answer E relating to the lowest maturity level.

**4. Building logistics development model for retail company**

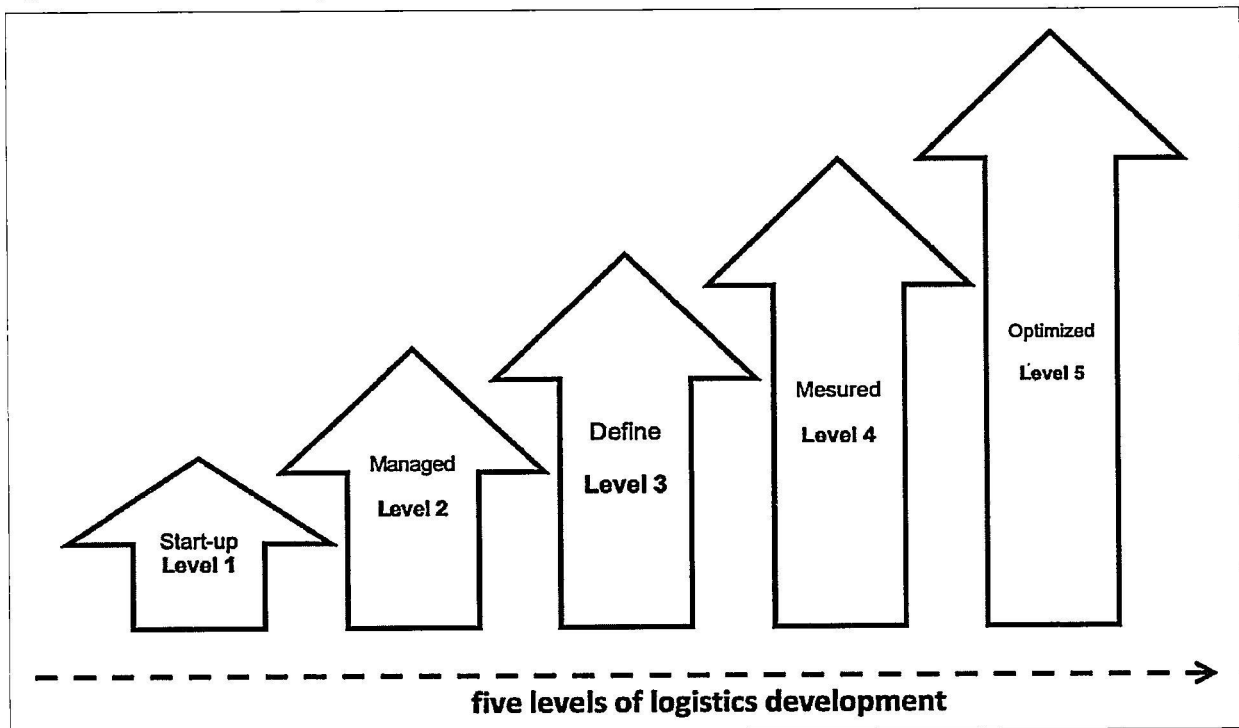
The logistics development model in retail companies is based on the logistics maturity model (LMM) developed by Battista et al (2012). LMM is a common

tool for describing typical behaviors demonstrated by a company or organization at different levels of maturity/development. The logistics development model shows five levels of logistics development, from the initial level (level 1) to the optimization level (level 5), including (Figure 2):

Level 1: Demand for logistics is acknowledged but related processes are not regulated or structured. Processes are characterized by a lack of governing rules and, in some cases, freely developed. Success in these organizations often depends on the capabilities of the people in the organization and success cannot be repeated unless the same individual is assigned to the next project.

Level 2: Logistics processes are managed but

Figure 2: Five levels of logistics development



(Source: Made by author)

not formalized or standardized. At this level, the company's logistics components are planned, documented, and executed at the project and process level.

Level 3: Logistics processes are formalized and standardized, but are neither controlled nor supervised. At level 3, processes are characterized and understood, and prescribed via policies, criteria, processes, tools, and methods.

Level 4: Logistics processes are controlled and monitored but not optimized.

Level 5: Optimized logistics processes. Logistics components are fully integrated and continuously improved based on organizational understanding.

Development of logistics activities is a change in the direction of increasing quantity and improving in quality in order to achieve higher goals, demonstrating development to a complete level through setting, adding, transforming and improve existing logistics operations, physical factors and logistics organization at retail companies. On that basis, developing logistics activities at retail companies includes the following three basic contents: (1) Establishing logistics

operations at a retail companies, (2) Designing the logistics organization structure at retail companies, (3) Developing logistics resources at retail companies. Each content will be broken down into several specific logistics issues/processes/functions (Table 3).

Table 3. Areas of logistics development model

Logistics area	Processes
Logistics activities	Purchasing
	Transportation
	Inventory
	Warehousing
	In-store logistics
Logistics organization	Logistics organization
Logistics resources	Technical facilities
	Logistics human resources

(Source: Made by author)

Table 4. logistics development model

Level/Logistics area	Unstructured (Start-up) Level 1	Managed Level 2	Formalization (Define) Level	Measured Level 4	Optimized Level 5
Logistics activities	Purchasing				
	Transportation				
	Inventory				
	Warehousing				
	In-store logistics				
Organize logistics	Logistics organization				
Logistics resources	Technical facilities				
	Logistics human resources				

(Source: Made by author)

With the characteristics of the logistics development level presented above, the author has built the evaluation criteria of logistics development in retail companies according to the following aspects and contents:

a. Criteria for evaluating the development of logistics operations: Level of manager's concern, Probability of estimating values, Level of process formalization, Measuring and controlling capabilities, Actions (measures) taken to optimize logistics operations.

b. Criteria for evaluating the development of organizing logistics: Centralization, Formalization, Specialization

c. Criteria for evaluating the development of logistics: The level of response to logistics needs, The degree of automation of logistics equipment,

The ability to exchange logistics data.

On that basis, the logistics development model at a retailer is depicted in Table4:

**5. Conclusion**

The purpose of the research has been achieved. The retail logistics development model has been built to support these companies in determining the level of development, from which to offer suitable solutions for their logistics activities. In the paper, there was presented an original concept of logistics development model in retail companies, which became a result of conducted research on the literature on the subject of logistics maturity model for retail companies. The results of the research will be used to assess logistics development in retail companies ■

**REFERENCES**

1. Battista C, Fumi A, Schiraldi MM (2012), "The Logistics Maturity Model: guidelines for logistic processes continuous improvement", Proceedings of the XXIII World POMS Conference, 20-23 April 2012; Chicago (USA).
2. Battista C., Schirald M. M (2013), "The Logistic Maturity Model: Application to a Fashion Company", *International Journal of Engineering Business Management*, pp. 5-29.
3. Logistics Management Institute - LMI (2006), *Logistics Maturity Evaluator*, MCLEAN VA.
4. Turner R, Jain A. (2002), *Agile meets CMMT: Culture clash or common cause?*, Proceedings of the Second XP Universe and First Agile Universe Conference on Extreme Programming and Agile Methods, pp. 153-165.

Received date: September 15, 2020

Reviewed date: September 28, 2020

Accepted date: October, 2, 2020

*Author's information*

Master. PHAM THI HUYEN

Thuongmai University

## XÂY DỰNG MÔ HÌNH PHÁT TRIỂN LOGISTICS CHO DOANH NGHIỆP BÁN LẺ DỰA TRÊN MÔ HÌNH LOGISTICS HOÀN THIÊN

● ThS. PHẠM THỊ HUYỀN

Trường Đại học Thương mại

### TÓM TẮT:

Bài viết nhằm mục đích xây dựng mô hình phát triển logistics cho doanh nghiệp bán lẻ, hỗ trợ cho các doanh nghiệp này có thể xác định mức độ phát triển, từ đó đưa ra các giải pháp phù hợp cho hoạt động logistics của mình. Mô hình phát triển logistics được xây dựng dựa trên mô hình trưởng thành logistics đã được công bố trong thời gian qua. Mô hình phát triển hoạt động logistics tại các doanh nghiệp bán lẻ chỉ ra 5 cấp độ phát triển của hoạt động logistics, từ cấp độ ban đầu (cấp 1) đến cấp độ tối ưu hóa (cấp 5). Nội dung phát triển hoạt động logistics tại doanh nghiệp bán lẻ bao gồm 3 vấn đề cơ bản: (1) Thiết lập các hoạt động logistics tại doanh nghiệp bán lẻ, (2) Thiết kế tổ chức logistics tại doanh nghiệp bán lẻ, (3) Phát triển nguồn lực logistics tại doanh nghiệp bán lẻ.

**Từ khóa:** Mô hình trưởng thành, mô hình trưởng thành logistics, logistics, phát triển, bán lẻ.