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# Smart Retail Adaptation Framework for Traditional Retail: a Systematical Review of Literature

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**Abstract** - The application of smart retail in traditional retail is unsuitable with adoption process instead requires adaptation to the limited resources. This study proposed framework of smart retail adaptation in traditional retail with systematic literature review by obtain primary studies relevant to the research question. The adaptation should take three stages which are visioning, design, and implementation and evaluation stage. Loop form is used to represent iterative process since smart retail as technological innovation must consider the risk of out-of-use and out-of-date. Eventually, the framework is useful in implementing adaptation stage-specific strategies to promote smart retail adaptation in traditional retail of developing country.

**Keywords** – Adaptation, smart retail, traditional retail

## I. INTRODUCTION

Recently market share and performance of Indonesian traditional retail have been decreased while the modern retail market share continues to increase. Although it has not been proven to have a quantitative effect, since traditional retail still contributes to non-oil and gas Gross Regional Domestic Product (GRDP) more than modern retail [1]. However, if this condition continued, the modern retail will be able to shift the important role of traditional retail in Indonesia economy.

The degradation of traditional retail market share and performance is due to several barriers, such as: 1) limited capital that makes facilities, variety and number of products cannot compete with modern retailers which have bigger capital, 2) limited access to obtain supply goods at low prices coupled with additional costs for transportation of goods that makes selling price becomes more expensive than modern retail, 3) lack of business process documentation that makes difficult to measure traditional retail performance, and 4) weak adaptability to technological advances since retailers and buyers comes from mid-low class with lack of knowledge about technology.

Many supports have been made to increase Indonesian traditional retail competitiveness, ranging from providing incentives or capital assistance from government and private sector, favorable government regulations, up to using technology to assist business documentation and ease of access to distribution centers. Nevertheless, all these efforts have not been able to

reduce the competition gap between traditional retail and its competitors.

Recently, many developed countries are developing smart retail concept as an alternative strategy to increase offline retail competitiveness against online retail. This strategy has never been tried for traditional retail since this concept is basically aimed at modern retail as most common form of retail in developed countries. Developing countries such as Indonesia, tends to adopt smart retail according to the basic concept, thus encouraging modern retail to implement it. The technology initiative for Indonesia traditional retail gives great opportunity to implement smart retail as an alternative strategy to increase market share. However, the smart retail concept cannot be directly adopted by traditional retailers, because requires a large investment which compatible with the capabilities of modern retailers. Therefore, traditional retail needs to resource their retail for smart retail adaptation to minimize the overall cost and leverage the maximum prospective of the implemented smart retail.

Previous studies related to smart retail limited to the process of adopting smart retail technology (SRT). Therefore, there has been no systematic review of smart retail adaptation, especially in traditional retail. This study examined the literature from various sources to formulate framework of smart retail adaptation in traditional retail. This study used systematic review to identify the literature systematically which is then assessed, selected, and concluded according to predetermined criteria based on high quality research evidence relevant to the research question (RQ). The main commitments of this study are highlighted as: *What kind of frameworks are proposed for smart retail adaptation in traditional retail?*

This paper is organized as follows. In section 2, the research methodology is explained. The results and answers to research questions are presented in section 3. Finally, our work of this paper is summarized in the last section.

## II. METHODOLOGY

Systematic literature review (SLR) chosen for reviewing the literature on the smart retail adaptation in traditional retail. An SLR is defined as a process of identifying, assessing, and interpreting all available research evidence with the purpose to provide answers for

specific research questions [2]. SLR is performed in three stages, which are planning, conducting, and reporting the literature review. In the planning stage, the requirements for a systematic review are identified based the research question. Furthermore, the review protocol developed, evaluated, and iteratively improved during the conducting and reporting stage of the review [3]. It defined the research question, search strategy, study selection process with inclusion and exclusion criteria, quality assessment, and finally data extraction and synthesis process. Table 1 shows the procedure for searching and selecting literature as a review protocol.

Conducting stage consists of some activities, such as search and select for primary studies from digital libraries matching the search string, extract data from primary studies, assess quality of primary studies, and synthesize data. Before starting the search, an appropriate set of databases must be chosen to increase the probability of finding highly relevant articles. A broad perspective is necessary for an extensive and broad coverage of the literature [4]. For this study, Scopus and Google Scholar were the main source of digital databases. Software package Mendeley (<http://mendeley.com>) was used to store and manage the search results.

The selected primary studies are extracted to collect the data that contribute to addressing the research question concerned in this review. Different strategies employed to synthesize the extracted data pertaining to research question. Generally, this study used the narrative synthesis method and the data tabulated in a manner consistent with the question.

### III. RESULTS AND DISCUSSION

Smart retail is defined as the use of smart technology that emerged in industry 4.0 era, such as Artificial Intelligent (AI), Internet of Things (IoT), Big Data Analytics (BAD), Radio Frequency Identification (RFID), and other similar technology at the retail stores to target and gain more customers [5], [6]. This makes smart retail as the latest technological innovation which then becomes an alternative strategy for offline modern retail. Therefore, smart retail is a relatively new topic research. Three challenges faced in searching primary studies for designing framework of smart retail adaptation in traditional retail:

- 1) Research publications with the keyword “smart retail” have appeared since 2014 when Pantano and Timmermans discussed smart retail features. However, the research before 2014 discussing the application of smart technology or technology innovation in retail, which similar concept of smart retail. Therefore, the search of primary studies expanded into the application of smart technology or technological innovation in retail.
- 2) Search of primary studies with search string (“Smart” AND “Retail” AND “Adaptation”) found 7 articles, which only one relevant to the research question in term of title, abstract and keywords, but not relevant

in full text. After the search string revised into (“Smart” AND “Retail” AND “Adoption”), the search found 4 relevant articles in full text. Search of primary studies with search string “Adoption” used as reference for adaptation since there is similarities in term of the process of implementing innovation in a system. However, adaptation process need adjustment with the capabilities of the system, whereas adoption process taken within given system.

- 3) Smart retail concept comes from developed countries which modern retail had replaced traditional retail. Therefore, traditional retail has not been considered for smart retail implementation. On the other hand, developing countries are still dominated with traditional retail which need to be prioritized. Therefore, basic concept of smart retail should synthesize with traditional retail characteristics to obtain framework of smart retail adaptation in traditional retail.

The final list of selected primary studies had 7 articles consisting of 5 articles related to smart retail adoption [7]–[11] and 2 articles related to the adaptation of technological innovation [12], [13]. Study about traditional retail in developing countries will be used to support the developed framework. Five of seven selected primary studies discussed complete adaptation or adoption framework with the stages. The remaining two articles mention about value-based framework and layers of smart retail technology (SRT) architecture, therefore none of the stage involved in their framework.

#### A. Stage One: Visioning

Generally, the adoption or adaptation process begin from identifying and analyzing the current condition of the target system to determine the retail ability to reply and adapt to changes due to the implementation of technology including the ability to recognize the value of a certain technological innovation and the ability to successfully integrate it within the retail strategy [14], [15]. The important aspects for the adoption or adaptation of technological innovation, including technical and technological knowledge, along with knowledge about current innovation adoption status [11], demographic of technology users, financial capability, competition, risks, managerial factors, significant characteristic of the retail (personality and attitude) and other environmental variables [10], [13]. Analysis of these aspects can be used to mapping the extent to which the adoption/adaptation of technological innovations that have been carried out in traditional retail, as a starting point for smart retail implementation. This step can be supplemented with performance measurement of traditional retail.

The result of the overall analysis are used to determine SRT alternatives which then selected based on criteria that facilitate the needs and capabilities of technology users (retailers, sellers and buyers) [10].

TABLE I  
REVIEW PROTOCOL

Review Question	“Smart Retail Adaptation in Traditional Retail”
Literature Search	<ul style="list-style-type: none"> <li>• Source: Scopus and Google Scholar</li> <li>• Search string: (“Smart” AND “Retail” AND “Adaptation”) AND (“Adoption”) AND (“Traditional”)</li> </ul>
Sorting	By relevance
Filtering	Inclusion journal papers, conference proceedings, book, and book chapter, limited in the period between 2012-2021
Inclusion criteria	<ul style="list-style-type: none"> <li>• Studies in grocery retail, either modern or traditional</li> <li>• For duplicate publications of the same study, only the most complete and the newest one will be included</li> <li>• Studies discussing and comparing framework smart retail adaptation or adoption in traditional retail</li> <li>• Studies discussing SRT adaptation or adoption in any kind of retail</li> </ul>
Exclusion criteria	<ul style="list-style-type: none"> <li>• Studies not written in English</li> <li>• Studies presenting unsubstantiated claims made by the author(s), for which no evidence was available</li> <li>• Studies discussing smart retail in other context other than adoption or adaptation process</li> </ul>
Evaluation	Full-text assessment: Inclusion of only those articles with specific references to the smart retail or SRT adaptation in traditional retail

These criteria closely related to choice of smart retail benefits intended to achieved, which are including superior customer experience, superior firm performance, increasing sales and consumer traffic, customer relationship, loyalty and trust, effective, targeted and location-based strategies, creation of smart partnership with customers, and new products and services[9]. Smart technology within traditional retail expected primarily to provide superior consumer experience, increased profitability, consumer participation to service delivery, and superior retail performance [16]. The selected SRT based on these criteria will determine the main objective of the smart retail adaptation. For example, if the selected SRT is Scan and Go System, then the adaptation process aims to build a similar concept by utilizing available technology that able to satisfy users’ needs at an affordable cost. All these steps can be classified as part of setting the goal of smart retail adaptation in traditional retail with term “Visioning”, which is divided into three steps: 1) Analyze and diagnose traditional retail system, 2) Selection of technological innovation, and 3) Define adaptation goal.

### B. Stage Two: Design

Next step is the identification of specific operational retail decision related to the selected SRT, which chosen from seven operational decision pertinent to store management: demand forecasting, in-store logistics,

inventory management, assortment and display, product promotion, checkout operation, and employee management [17]. For example, Scan and Go System closely related to checkout operation, in-store logistics and inventory management, therefore the focus of adapting SRT on these three operational decisions. Subsequently, identify and classify value chain activities, workflow, flow of goods and information involved in these decisions.

Performance criteria also need to be determined to measure the success of SRT adaptation. The main and foremost criteria is financial such as profitability by taking into account risk of out-of-date and risk out-of-use[18]. Out-of-date concerns the risk of obsolesce of the internal technical components of the technology, each of which may have substantial effect on the whole system. Hence, while estimating the possible risks, it is essential to evaluate in advance the innovation life-cycle curves, time for being out-of-date of each component, and the related effect on the whole system. retailers must consider that the life cycle of SRT needs to be longer than the break-even time for return on investment for achieving profitability. Other criteria that can be considered are from the employee side such as job satisfaction, from service side that related to adapted SRT such as average queue length for Scan and Go System, and from buyer/customer side such as customer’s acceptance which can also measure out-of-use risk by using technology acceptance model (TAM) [19] and its extended version. However, it is worth to consider criteria that representative of all adapted SRT users to identify system weakness that need to be improved.

Determination of performance requirements for selected SRT to be adapted in traditional retail will be used to provide information for software designers and developers, provide the basis of more systematic selection and evaluation of SRT hardware and software, and reduce the risk involved in implementing adapted SRT [12]. The performance requirements then translated into parameter design of traditional retail system that apply the features of selected SRT to entire retail operational activities. This design parameter is an object-based information system design which including the desired function in the designed system, the type of data or information to be processed, workflow system, and interface design from software, hardware, user, and communication. Basic technology used for traditional retail covers all available technology which able to build same feature as chosen SRT with an affordable cost and risk. For example, mobile application has rapidly become one of the most popular and attractive marketing strategies for retail, both modern and traditional, as it is can be basis for many SRT such as Buy Online Pick-up in Store (BOPIS), Proximity Marketing, and Scan and Go System. Mobile application is an example of application layer (information integration layer) of Internet of Things (IoT) architecture [7].

All these steps starting from determination of performance requirement until establish information technology (IT) requirement are part of design stage of

smart retail adaptation in traditional retail. Therefore, stage “Design” consists of 1) Determine performance requirement, 2) Develop new system, and 3) Establish information technology (IT) requirement.

### C. Stage three: Implementation and Evaluation

The shifted from traditional retailing to the smart one, characterized by the increasing access and connectivity, and increasing information sharing and collaboration (partnership), towards the smart usage of technologies for collecting real time data on every single-consumer behavior and preference [10]. Smart partnership among retailers, sellers (e.g. frontline employees), and buyers through the building of smart cooperation (which overcomes difficulties inherent in traditional vendor-client relationships) [20]. This partnership might work only if retailers are able to involve buyers or consumers in technology adaptation for shopping purposes. Therefore, in developing IT support would be reviewed by users (retailers/sellers and buyers) to find system errors in software and hardware. If there are no changes to the built SRT adaptation system, then the new system is ready for release. User favorable attitude toward new system must formed first before implementing the system. This kind attitude built by giving awareness knowledge about the technology to motivates users to seek “how to” knowledge that consists of information necessary to use the technology appropriately. Mentally, it applied the new idea to user present or anticipated future situation before deciding about trying it [21]. Furthermore, to make SRT successfully adapted in traditional retail, retailers need to get the customers’/buyers’ permission and consent toward new system. This would help building trust and transparency between retailers and customers/buyers. Moreover, the adapted SRT should be attractive for all potential users (retailers, employees, buyers) [22].

Implementation of the adapted SRT occurs when the new system is put into real practice. Problems in exactly how to effectively put the new technology to use come up at the implementation. Even after the decision to adapt SRT is made, uncertainty about the consequences and challenges of the innovation still exists. It involves operational problems that gradually come up after the new system is used. This step continues till the new system becomes an institutionalized practice in the retail that has adapted the SRT [23]. The success of implementation is measured based performance criteria that have been determined in the first step of Design stage.

The last step in this proposed framework is the evaluation of overall process of smart retail adaptation in traditional retail. Based on the evaluation, strategy can be formulated to make smart retail adaptation in traditional retail offer success not only for retailers in terms of profit and retail operational efficiency, but also for buyers/consumers in term of improving their shopping experience. Successful strategy will consider the timing, the out-of-date and out-of-use risks, the means of attracting potential users, the involvement required and

the extent to which these are to be exploited, the effects on the organization and on the actual traditional retail model which would be adapted to the new retail approach [10]. Understanding the source and natures of adaptation process is important to make traditional retail system more adaptive to changes. The formulated strategy is also related to the improvement of retail performance after the implementation of smart retail adaptation. The adaptation process in traditional retail needs to be done continuously, which is to improve quality and reduce cost, retail operational activities may be modified or completely redesigned with or without dramatic change in the retail structure. A good system should be able to handle surprises without interrupting normal operations by doing retail redesign, procedure adjustment, and process improvement and innovation [12].

This last stage named “Implementation and Evaluation” consist of 1) Develop smart partnership & IT support, 2) Manage change process, 3) Implement pilot system and performance monitoring and measurement, 4) Evaluated system and continuous improvement. The final proposed framework for smart retail adaptation in traditional retail as shown in Fig. 1.

The proposed framework in the form of a loop represents an iterative process, either the process after continuous improvement or when starting a new process with a different SRT. This kind of form is suitable for the adaptation process of technological innovations that must consider the risk of out-of-use and out-of-date of a technology innovation.

## IV. CONCLUSION AND FUTURE WORKS

Although current study in retailing is moving towards a “smarter” scenario, there is still a lack of knowledge of how technology-based innovations change traditional retail and what kind process need to be done to apply smart retail technology within traditional retail to achieve business profitability. Smart retail application in traditional retail requires an adaptation process to make it affordable both in terms of cost and capabilities. This study provides new perspectives in smart retail by offering framework of smart retail adaptation that can be used to improve traditional retail in developing countries.

The framework proposed a three-stage model of smart retail adaptation and implementation in traditional retail. These stages are Visioning, Design, and Implementation and Evaluation which each of stages consists of several steps. The visioning stage emphasized the importance of setting the adaptation goal through three steps which are analyze and diagnose traditional retail system, selection of appropriate technological innovation or SRT that compatible with traditional retail system and define adaptation goal based on selected SRT.

The design stage involved steps to develop design of adapted system starts with determine performance requirements which translated into parameter design of

the adapted system including IT requirement that apply features of selected SRT. Last stage involving four steps, which are develop smart partnership among users of SRT and develop IT support, manage change process, implement pilot system and performance monitoring and measurement, and evaluated system and continuous improvement. Loop form is used in the framework to represent iterative process since smart retail as technological innovation must consider the risk of out-of-use and out-of-date.

As this current study is conceptual in nature, ongoing empirical study is indicated to broaden the field of smart retailing. The suggested framework could be empirically tested with qualitative case study as study done by [8] or mixed method between qualitative textual data and quantitative Delphi technique as used by [11]. Other researchers could add some other factors that can play an important role in expanding the proposed framework and in the conceptualization of similar framework. Eventually, this will help in implementing better adaptation stage-specific strategies to promote smart retail adaptation.



Fig. 1. Smart retail adaptation in traditional retail framework

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