INTEGRATION OF THE KANO MODEL WITH OTHER QUALITY MANAGEMENT MODELS TO IDENTIFY FACTORS SUSTAINING CUSTOMER'S SATISFACTION: A SYSTEMATIC LITERATURE REVIEW

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Abstract

This research is intended to explore factors that influence customer's satisfaction within the framework of the Kano Model. Customer's satisfaction is important because it represents the quality of goods purchased by customers. The integration of the Kano Model with other models orientating on quality management increase customer's satisfaction. A Systematic Literature Review is chosen to identify various literatures to see how the integration of the Kano Model with other models is addressed to identify factors that influence customer's satisfaction. This SLR uses the methodology of PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) to identify twenty-four inclusive-selected articles relating to the determined-factors and limited to tangible products (goods), not services (intangible products). The results demonstrate that factors for satisfying customers can be determined by the management of product itself and the management of customer's feeling in order that the satisfaction of customer achieves a "One-dimensional" level or "Attractive" level within the Kano Model framework. The finding is that there are six variable factors that can achieve customer's satisfaction on certain products (goods). Those factors are understanding customer need, optimizing product design, management of quality, product operation, compliance, and after sales service. Each of the factors has certain parameter(s). One of the factor that is frequently ignored by manufacturer to satisfy customers is compliance to regulation that is also able to sustain satisfaction of customers. However, papers studying the amalgamation between the Kano Model and compliance requirement to create product quality for achieving customer's satisfaction is relatively rare during the past decade. This rare research area needs to be studied further since this paper only explores the amalgamation of the Kano Model with general quality management models.

Keywords: Integration, Kano, Quality, Customer Satisfaction.

1. INTRODUCTION

Previous literatures show that customers' perception of products they bought relates to quality (Van Doorn et al., 2020). Event, consumer's perception on the past quality influences the present reputation of a product (Landon & Smith, 1997). Accordingly, bad reputation of a company is caused by customers' impression that the company produces a bad product quality (Allen, 1984). With regard to liability concern, quality also relates to product liability (Goodden, 2001). Therefore, this paper establishes an important concept that quality of a product is a perception of customer which can raise a feeling of satisfaction. This paper examines several literatures relevant to research on enhancing product quality through the enhancement of customer's satisfaction. Customer's satisfaction can be seen and categorized in some levels of satisfaction through the Kano Model (Tontini, 2007). The Kano Model itself was firstly introduced by Noriaki Kano in 1984 (Shahin et al., 2013). Since its discovery in

1984, the Kano Model has been studied by numerous scholars in spreading database. Based on data retrieved using Harzing's Publish or Perish tool, it is found that the available articles are still more than 200 articles on the Scopus recommended publisher with the title embedding "Kano Model" within one-year period only (2020-2021). The Kano Model describes the level or position of customer's satisfaction. Six Kano Model categories is identified to measure satisfaction (Tontini, 2007), i.e.: One-dimensional (O) which means that the more you provide this function, the happier the customer will be; Attractive (A) means that the customer is pleased when it is present but will not complain if it is not present; Must-be (M) implies that if the product lacks this feature, no one will be interested in it; Indifferent (I) indicates that the customer is unconcerned about this feature; Reverse (R).

Research Question (RQ): What factors that can be identified (and how they work) to satisfy customers through empirical research? To find the answer, this paper establishes "customer's satisfaction" as an independent variable that is influenced by several factors/determinants. Each factor has some parameters on how such independent variable is achieved. Some literatures that are reviewed in this paper independently explore the factors influencing customer's satisfaction. Therefore, this paper is important for quality management study (particularly in manufacturing and marketing strategy) to fill any gaps between manufacturer's or marketer's expectation and customer's expectation, trough synthesizing factors that have been written by scholars to satisfy customer. The literatures reviewed in this paper are limited to those that studied quality of goods, services are excluded.

2. LITERATURE REVIEW

2.1. Achieving Customer's Satisfaction

The literature review is intended to enhance the applicability of the Kano Model for the purpose of achieving customer's satisfaction. Those attributes can be overlaying on the Kano's model diagram in Figure 1 below (Yang, 2005). In the framework of the Kano Model, it is important to bring customer's feeling into satisfaction attributes within the O or A quadrant.
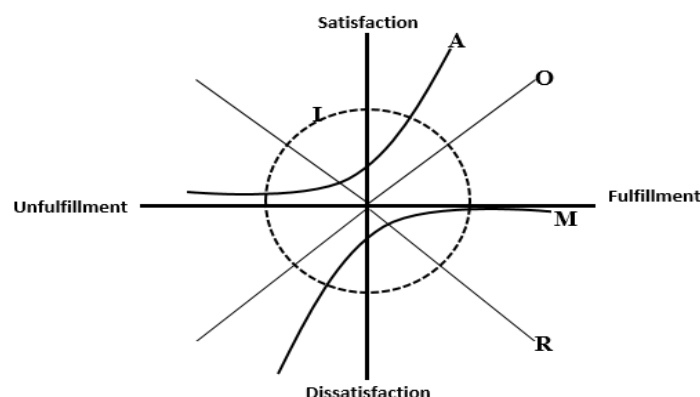

Figure 1: Satisfaction Attributes in Kano Model

2.2. Why the Kano Model is Chosen to determined Customer's Satisfaction?

Choosing the Kano Model in this research is because of universality in its use. Based on a cultural perspective, the Kano Model can be universally used in countries across the globe. (Hejaili et al., 2009) uses the Kano Model in their comparison study on the perception of hospital's patients in the Saudi Arabia and Austria, within which the Arab patients tend to be reluctant to express their dissatisfaction comparing to Austrian patients. Other study using the Kano Model also shows that the element for attributing quality can be flexible used to compare the expression of customers living in America and in Japan (Witell et al., 2013). Other countries where the Kano Model is used to measure customer's satisfaction are Russia (Plehn et al., 2016), Peru (Barrios-Ipenza et al., 2021), Korea (Song, 2018) and introduced by Berger in the Western world (Song, 2018) (Witell et al., 2013).

2.3. Perceived Ease of Use (PEOU)

A literature review according to Leedy and Ormrod is an activity to revisit what previous scholars have written (Kotzé, 2007). The objective of literature review is to show that a researcher has conducted critical examination of the quality of literature by comparing the classification and summarizing of the findings amongst the previous works or research written by other scholars (Thomas, 2021).

After determining the Kano Model to identify customer's satisfaction, this research explore several articles that have attention on customer's satisfaction. The Systematic Literature Review is then chosen because it provides technique to identify and synthesize several scholars' findings relating to customer's satisfaction. The common technique of Systematic Literature Review is the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Model (Moher et al., 2009). The PRISMA Model is chosen for this literature review because it has ability to incorporate systematic review and meta-analysis (Wicaksono et al., 2022).

3. METHODOLOGY

3.1. Research strategy

Literatures relating to the integration of the Kano Model and other models for product quality improvement to satisfy customer was collected as criteria. Journal articles during the period of twenty-five years (1998-2023) discussing such integration were selected using Scopus database. As the aim of this research is to find out the mechanism of the Kano Model integration with other models for its practical usefulness, the keywords are managed before they were applied in Boolean search.

To give impact for this research, the determination of keywords considers CIMO technique (Denyer et al., 2008), which elaborates that C (Context) is the group/aspect of interest (generally a group of individuals or aspects of the setting/system), I (Interventions) is the interventions of interest, M (Mechanisms) is triggered by the intervention, and O (Outcomes) is relevant outcomes (generally the effects of the intervention). From the keywords, "Integration" is the intervention, "Kano (Model)" is mechanism, "Improve" is outcome, and "Quality" is the first

context and "Customer Satisfaction/Requirement/Need" is the second context. This technique leads the search string on the Scopus database as extracted in Table 1.

Table 1: Developing Search String

I	M	O	C₁	C₂
Integration				Customer Satisfaction
Incorporation	Kano Model	Improve	Quality	Customer Requirement
Combination				Customer Need

In light of CIMO technique, the keywords are managed in order to explore the most suitable and relevant articles: "Integra*" OR "incorporat*" OR "combin*" AND "Kano" AND "Quality" AND "Customer*" AND "Satisf*" OR "need*" OR "require*". This is one of the kind of state of the art of Systematic Literature Review (SLR) where similarity of words can use asterix (*) and synonym to be blended with the words "AND" and "OR". The results from Scopus database are 273 articles, using this search string TITLE-ABS-KEY ("Integra*" OR "incorporat*" OR "combin*" AND "Kano" AND "Quality" AND "Customer*" AND "Satisf*" OR "need*" OR "require*"), which were then limited only to journal, final stage publication and article in English. From the search results, as extracted in Figure 2, it is found that the most frequent journals publishing this research topic are Total Quality Management and Business Excellence, TQM Journal, Jisuanji Jicheng Zhizao Xitong Computer Integrated Manufacturing Systems CIMS, Expert Systems With Applications and Iop Conference Series materials Science Engineering.
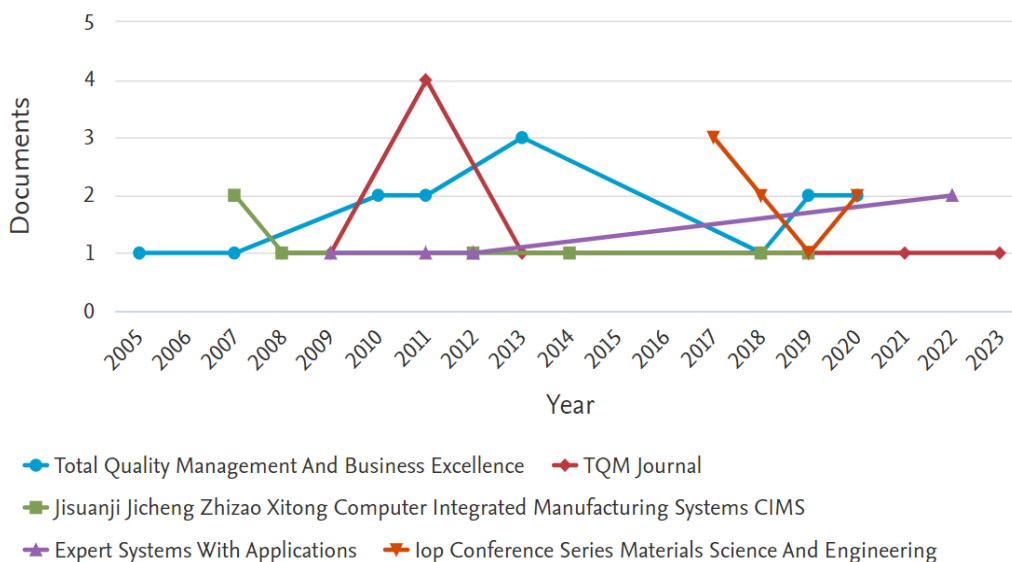

Figure 2: The frequent of Journals Publishing the Research Topic

Based on the statistical analysis in the Scopus database (Figure 3) it shows that engineering and business are the two most frequent subject areas (each is more than 20%) studying the topic of this literature review.
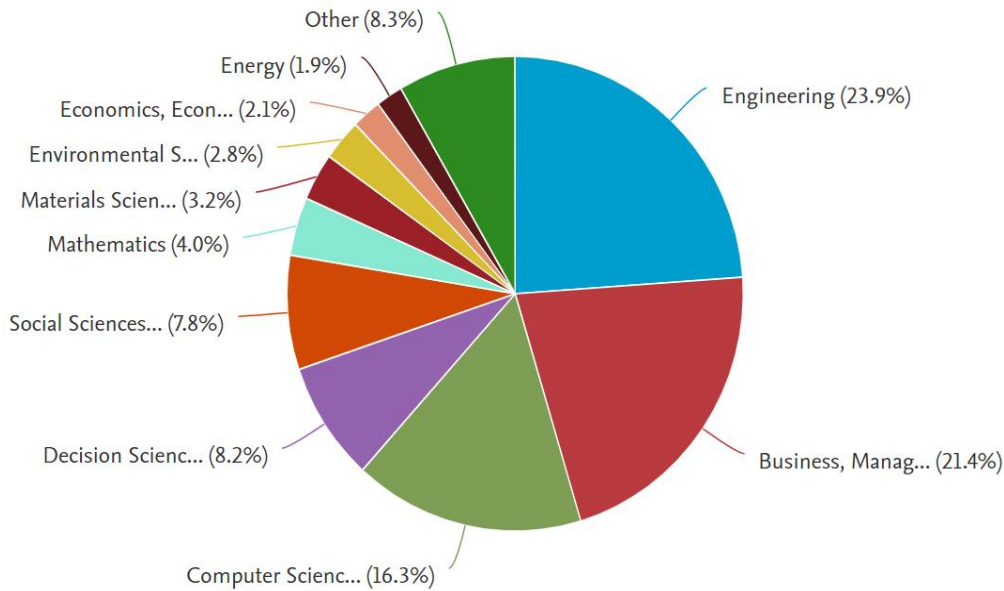
Figure 3: Most Frequent Study by Subject Area

3.2. Determining limitation (inclusion and exclusion)

After managing keywords as the basis for search string, three eligible criteria are set up into some inclusions. These Inclusion Criteria (IC) will be used in the synthesis process. The 273 articles were extracted using these Inclusion Criteria (IC). Criteria1 (IC1): limited to ten-years period (2013-2023), articles/journals only and in English.

Limited to articles and journal because the most dynamic research development is written in journal. Published in English because this research is aimed to be published on a journal in English and the objective of this research is to fill the research gap from the articles that have been written in English.

Criteria2 (IC2): limited to articles about integration of Kano Model and other models because the trend in Scopus database shows that during this decade the review of Kano Model and other models significantly soared (compared to the previous decades). Criteria3 (IC3): effect of the Kano model integration relating to manufactured product (goods only, but services are excluded).

3.3. Data Collection, Data Extraction and Data Analysis

This systematic literature review uses search string "Integra*" OR "incorporat*" OR "combin*" AND "Kano" AND "Quality" AND "Customer*" AND "Satisf*" OR "need*" OR "require*" applied in the SCOPUS database, resulting 237 articles published within the range of period 1998-2023. Since the publication in the topic of integration of Kano Model with other models relatively increased after 2013 comparing to previous decade, the period of 2013 until 2023 was determined to limit the search (Figure 4).
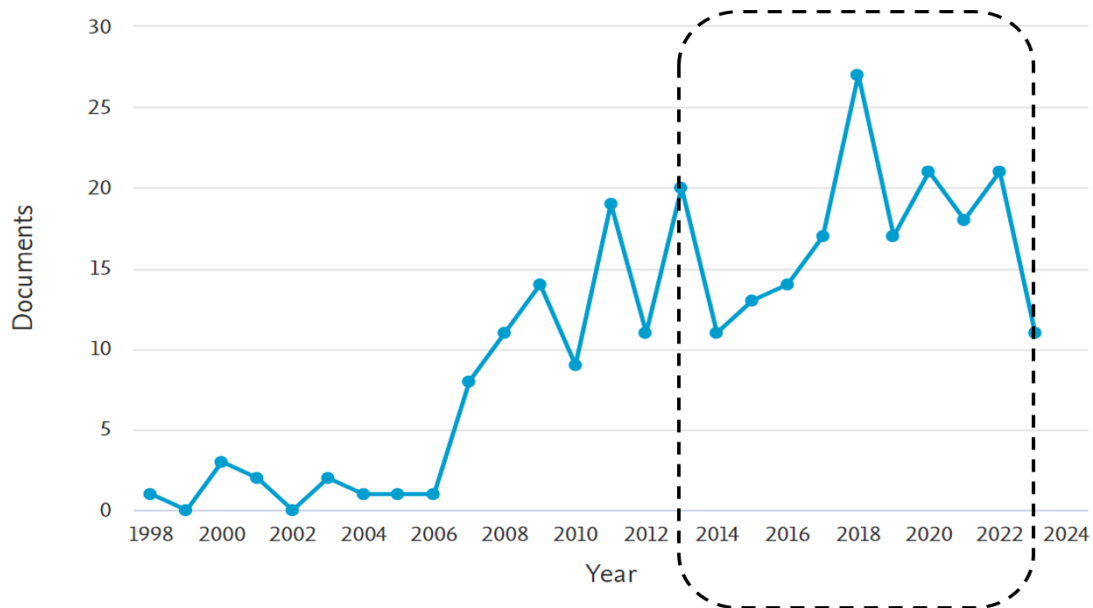
Figure 4: Period of Literature Review

4. RESEARCH AND DISCUSSION

4.1. Research Results and Qualitative Synthesis

The PRISMA Model as shown in Figure 5 guides literature review mapping through the four steps. The first step is defining objective of the literature review.

The second step is a screening process of relevant literatures. The third step is exploration of eligible literatures. The last fourth step is analysis, which is the core of literatures review activity.

From the 237 articles, it was obtained 180 articles from Scopus database only filtered by IC1 and those are exported to Mendeley. The second screening filters articles elaborating integration of Kano Model and other models only to be aligned with the purpose of this literature review. The method of the second screening uses IC2 by reading the titles, abstracts and keywords of the 180 articles retrieved from Mendeley.

From the IC2, it was acquired 108 articles because the other 72 articles did not meet the inclusion criteria, i.e. studying the Kano Model integration. The full text of the 72 articles were then read to select the most relevant articles elaborating the effect of the Kano model integration relating to quality management of manufactured products for customer's satisfaction (IC3).

Therefore, there are 84 articles studying the quality management relating to services irrelevant to this literature review which focuses on the technicality of design and engineering of manufactured product. As the result of the IC3, it was concluded 24 articles.
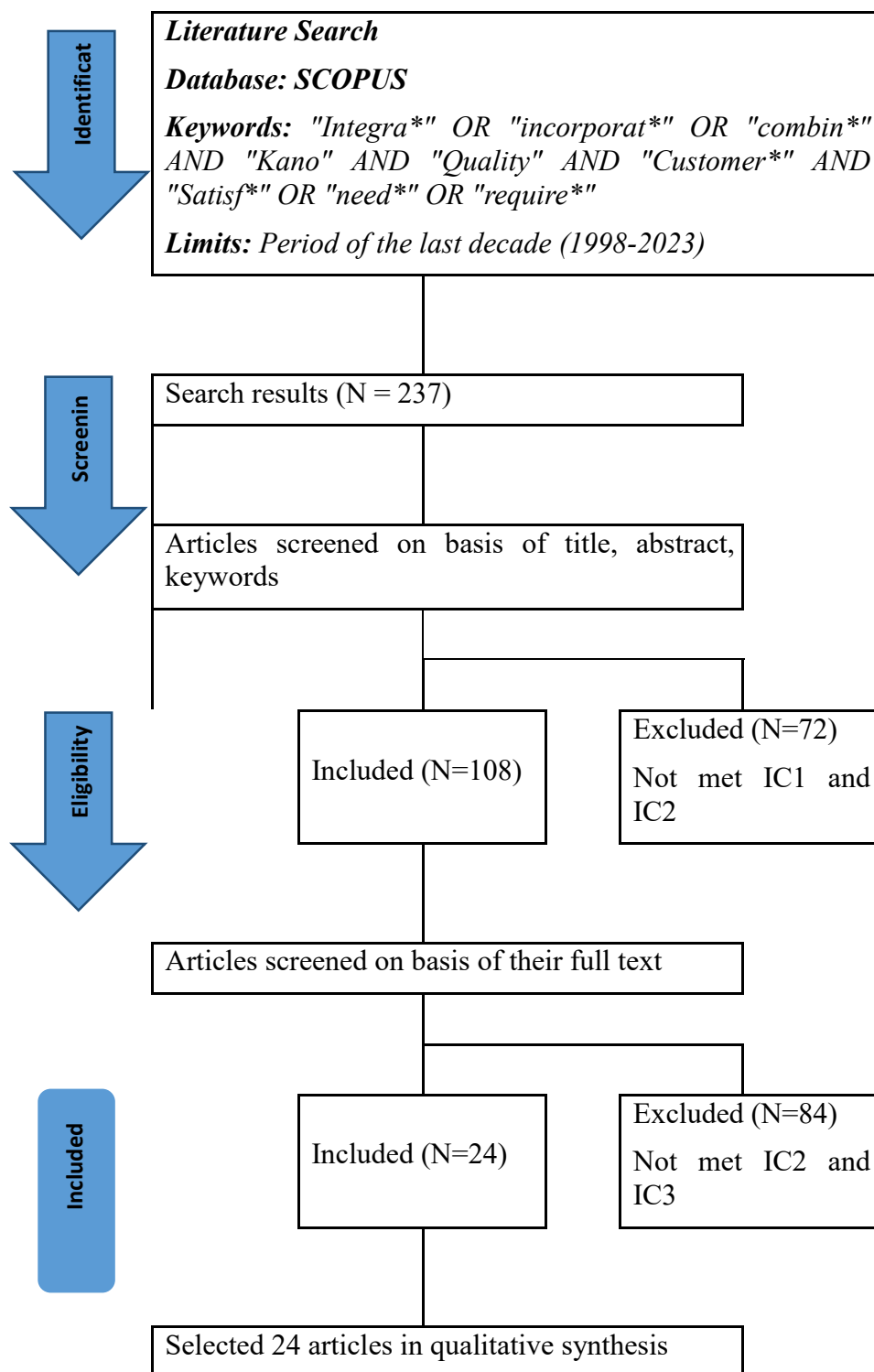
Identificat

Literature Search

Database: SCOPUS

Keywords: "Integra" OR "incorporat*" OR "combin*" AND "Kano" AND "Quality" AND "Customer*" AND "Satisf*" OR "need*" OR "require*"*

Limits: Period of the last decade (1998-2023)

Screenin

Search results (N = 237)

Articles screened on basis of title, abstract, keywords

Eligibility

Included (N=108)

Excluded (N=72)

Not met IC1 and IC2

Articles screened on basis of their full text

Included

Included (N=24)

Excluded (N=84)

Not met IC2 and IC3

Selected 24 articles in qualitative synthesis

Figure 5: PRISMA flow diagram

Those 24 articles extracted from the PRISMA Protocol are synthesized in Table 2. As a qualitative synthesize, the of 24 articles are identified from the information of the authors, the title, the year of publication, the other models which are integrated with the Kano Model, the reasons of their integrations, the used of methodologies and the object of research of those articles. The research were mostly written by a group of researchers. From learning the articles, their titles are not necessarily mentioned about integration of the models, but they showed the utilization of such integrations. The Quality Function Deployment (QFD) is the most common model integrated with Kano Model. The main purpose of those 24 articles is customer satisfaction. The objects of the research in the articles are divergence from simple home appliances, such as fruit-juicer, desk lamp and cabinet design, until technologically-complicated product, such as car and machines. Both quantitative and qualitative methods are proven to approach the integration of the Kano model with other models.

From the 24 selected articles, a qualitative synthesis was conducted and summarized as shown in Table 2.

Table 2: List of Articles and Qualitative Synthesis

No.	Author	Title	Year	Kano Integration with Other Model	Reason of Integration	Used Methodology	Research Object
1	Yadav, H C Jain, R Shukla, S Avikal, S Mishra, P K	Prioritization of aesthetic attributes of car profile	2013	Fuzzy Kano Model (Modified Kano Model) with Benchmarking Theory, Grey Model and House of Quality (HoQ)	Customer requirement	Quantitative	Car
2	Nahm, Y.-E.	A novel approach to prioritize customer requirements in QFD based on customer satisfaction function for customer-oriented product design	2013	Quality Function Deployment (QFD)	Customer Satisfaction	Quantitative	Car door
3	Xiong, W Yu, Y Wang, J	An Improved Algorithm for Product Conceptual Design based on Quality Function Deployment	2015	Quality Function Deployment (QFD) and integrated rough analytic hierarchy process (RAHP)	Customer satisfaction	Quantitative	Product design
4	Sari Dewi, D R	Application of an integrated qfd and kano's model case study: Cabinet design	2016	Quality Function Deployment (QFD)	Customer satisfaction	Quantitative	Cabinet design

5	Saranya, K Santhi, P	Enhancing customer delight in LED televisions by using the KANO model	2016	-	Customer satisfaction	Quantitative	Users of LED television
6	He, L Song, W Wu, Z Xu, Z Zheng, M Ming, X	Quantification and integration of an improved Kano model into QFD based on multi-population adaptive genetic algorithm	2017	Importance-frequency Kano (IF-Kano) and Quality Function Deployment (QFD)	Customer requirement	Quantitative and Qualitative	A home elevator design
7	He, L Song, W Wu, Z Xu, Z Zheng, M Ming, X	TRIZ and the Kano model: Proposing an integrated approach for improving product quality according to customer needs	2017	Theory of Inventive Problem Solving (TRIZ)	Customer expectations	Qualitative	One of the products of an automobile manufacturer company
8	Mansur, A Janari, D Setiawan, N Suryoputro, M R Albar, F B	Design improvement of supply chain information system or public transportation services (Case study: Trans Jogja)	2017	Quality Function Deployment (QFD)	Consumer's comfort	Qualitative	Android system design technology
9	Gangurde, S R Patil, S S	Benchmark product features using the Kano-QFD approach: a case study	2018	Quality Function Deployment (QFD)	Customer satisfaction	Quantitative	Smart cell phone
10	Madzík, P Pelantová, V	Validation of product quality through graphical interpretation of the Kano model: An explorative study	2018	Graphical Interpretation Methodology	Customer requirements	Quantitative	E-shop web pages
11	Kang, X Yang, M Wu, Y Ni, B	Integrating Evaluation Grid Method and Fuzzy Quality Function Deployment to New Product Development	2018	Analytic hierarchy process (AHP) and Quality Function Deployment (QFD)	Consumer satisfaction	Quantitative	Mini cars
12	Dou, R Li, W Nan, G	An integrated approach for dynamic customer requirement identification for product development	2019	Benchmarking theory and House of Quality (HoQ)	Customer expectations and maximize customer's revenue	Quantitative	Smart phone

13	Haber, N Fargnoli, M	Prioritizing customer requirements in a product-service system (PSS) context	2019	Quality Function Deployment (QFD)	Customer needs	Quantitative and Qualitative	Hemodialysis devices
14	Shi, Y Peng, Q	A spectral clustering method to improve importance rating accuracy of customer requirements in QFD	2020	Quality Function Deployment (QFD) and Importance-Performance Analysis (IPA)	Customer requirements	Quantitative	CNC machines
15	Wang, T Zhou, M	A method for product form design of integrating interactive genetic algorithm with the interval hesitation time and user satisfaction	2020	Fuzzy Kano Model (FKM)	Customer needs	Quantitative	Electric bike
16	Oey, Elia Gabriella, Eunike	Integrating Kano's model into quality function deployment to facilitate decision analysis: A case study at a medium enterprise of export garment manufacturer in Bali	2020	Quality Function Deployment (QFD)	Customer needs	Qualitative	Medium-sized manufacturer of beach wear and sarong for export market
17	Ishak, Aulia Ginting, Rosnani Suwandira, Bayu Fauzi Malik, Alfin	Integration of Kano Model and Quality Function Deployment (QFD) to Improve Product Quality: A Literature Review	2020	Quality Function Deployment (QFD)	Consumer wants	Qualitative	Literatures
18	Rau, H Tandiono, Y	A green-innovative product development process for satisfying the requirements of stakeholders	2020	QFDE and TRIZ methods	Customer requirements and the environment	Quantitative	Desk lamp
19	Kang, Xinhui Qu, Min	Multi-kansei qualities optimization design of products combined with refined Kano model and QFD	2020	Multi-Kansei qualities and Quality Function Deployment (QFD)	Customers' emotional needs	Quantitative	Citrus juicer

20	Li, Ming Zhang, Jie	Integrating Kano Model, AHP, and QFD methods for new product development based on text mining, intuitionistic fuzzy sets, and customers satisfaction	2021	Analytic hierarchy process (AHP), Quality Function Deployment (QFD) methods and Intuitionistic Fuzzy Set (IFS)	Customer reviews	Quantitative	Vertical-configured air conditioner (VAC)
21	Xiangdong, L Youlong, H Peng, Q Wei, L	A computer-aided approach for acquisition and importance ranking of customer requirements from the online comment mining	2022	Importance Ranking Method and Quality Function Deployment (QFD)	Customer requirements	Quantitative	A mobile phone online comment
22	Mahatthana chosit, N Chompu-Inwai, R	Use of the Kano Model and Conjoint Analysis to Evaluate Attributes Affecting Restaurateur Preferences Fresh Pork Products	2022	Conjoint Analysis (CA)	Customer requirements	Quantitative and Qualitative	Manufacturer and distributor of a range of food products
23	Zhang, D Li, Y Li, Y Shen, Z	Service Failure Risk Assessment and Service Improvement of Self-Service Electric Vehicle	2022	Integrated Fuzzy Failure model, Effect Analysis and Risk-Satisfaction Analysis	Consumer satisfaction	Quantitative	Electric vehicle
24	Tandiono, Y Rau, H	An Enhanced Model Using the Kano Model, QFDE, and TRIZ with a Component-Based Approach for Sustainable and Innovative Product Design	2023	Quality Function Deployment for Environment (QFDE) and the Theory of Inventive Problem Solving (TRIZ)	Customer and environmental requirements	Quantitative and Qualitative	Desk lamp

4.2. Research Results and Qualitative Synthesis

From the 24 articles selected in the literature review, the determinant which was the subject of discussion was determined, namely customer's satisfaction, which was then analyzed based on the following criteria:

1. Customer's satisfaction becomes dependent variable.

2. Independent variables/factors are needed to make customer satisfaction the main target. From 24 articles, at least 6 factors were found.

3. After identifying 6 factors (independent determinants), then it is discovered the parameters in these determinants which supports the achievement of Customer's satisfaction so that it can be integrated into the Kano Model. Customer satisfaction itself can be measured from the Kano Model. However, the Kano Model is applicable in general sense. So that when applied in various application fields, the Kano Model requires integration with other models to achieve customer satisfaction in accordance with the objectives of each application/product field.

4. Selected articles containing models for achieving customer's satisfaction that can be combined with the Kano Model.

5. From the results of this combination, customer satisfaction criteria for each product produced can be produced.

Factors influencing Customer Satisfaction (all selected articles have the same focus on how to satisfy customer) are extracted in Table 3.

Table 3: Variable Factors to Achieve Customer Satisfaction

No.	Variable Factor	Parameter	Approach to Achieve Parameters	Earlier Research
1	Understanding customer need	a. Customer perception	1) Calculating the relative importance of different aesthetic attributes	(Yadav et al., 2013), (Dou et al., 2019), (Nahm, 2013)
			2) Predicting customer's tastes in a targeted-time	
		b. Competitor performance	1) Competing analysis between the product being improved (or developed) and its competitors for similar products	
			2) Analyzing competitor performance and product's functionality	
		c. High competitiveness	Combining the competitive benchmarking analysis to model the customer's reference structure	
2	Optimizing product design	a. Engineering characteristics (technical requirements)	1) Correlating consumer desire and technical characteristics of product.	(Dewi & Rahaju, 2016), (He et al., 2017), (Kang et al., 2018), (Li & Zhang, 2021), (Saranya & Santhi, 2016), (Shi & Peng, 2020), (Tandiono & Rau, 2022)
			2) Determining appropriate Kano categories of Customer Requirements (CRs) and target values of engineering characteristics (ECs) to achieve optimal design solution for the balance between enterprise satisfaction and customer satisfaction (CS)	
			3) Increasing design efficiency of new products	
			4) Diversifying and personalizing emotional needs (ENs) of customers to purchase products in	

			which a new product development and design (NPDD) not only to fulfill the customers' basic function needs (FNs) for products, but also to satisfy customers ENs	
		b. Functionality of product by considering technology	Designing LED TV to be more clear motion rate	
		c. Manufacturing capability	Improving the Important Rate (IR) accuracy of Customer Requirements (CRs)	
		d. Product development process	Fulfilling customer requirements	
3	Management of Quality	a. Innovation	1) Innovating conceptual design of product 2) Measuring product requirements from customers' perspectives for product development to achieve a competitive advantage in a product market 3) Applying specific functions and intangible value-added services 4) Designing and innovating product based on customer requirements to guide product developers to redesign product, and improve the integrity and efficiency of product (repetitive design and innovation)	(Xiong et al., 2015), (Saranya & Santhi, 2016), (Ma et al., 2019), (Xiangdong et al., 2022), (Yadav et al., 2013), (Dou et al., 2019), (Yadav et al., 2013), (Dou et al., 2019)
		b. improvement of product attribute from customer perception and competitor performance	1) Converting customer's emotions into usable design data to improve product design	
			2) Understanding customer requirements accurately to manufacture products which can match customer's changing tastes 3) Determining specifications for the design attributes after performing a competitive analysis between the product being improved (or developed) and its similar products of competitors 4) Considering the effect of competitor's performance in addition to concentrating on the direct influence of product's functionality	
4	Product	a. Applying scientific	Integrating customized consumer	(Ma et al., 2019),

	operation	engineering (technology)	interactions and mass production efficiency to develop new technologies, and subsequently applying these technologies to innovate ancillaries services such as providing driving services guidance, innovation guidelines, and developing smart applications	(Haber & Fargnoli, 2019), (Mansur et al., 2017), (Oey & Gabriella, 2020)
		b. Combining products and services functionality	Integration of the customers' requirements by targeting the value-creating attributes that can enhance the offered value	
			Designing system tailored to the needs of consumers through the voice of customer	
		c. improving marketing	Improving marketing and operation management based on customer attributes gap in Kano model	
		d. product operation management	Improving management	
5	Compliance	Fulfilling Government requirements	Identifying factors that influence customer's decision	(Mahatthanachosit & Chompu-Inwai, 2022)
6	After sales service	a. Safety concerns	1) Improving the service quality of safety function for driver (customer)	(Ma et al., 2019), (Zhang et al., 2022)
			2) Improving and guaranteeing services	
		c. Financial value	Valuing financial loss of customer and guaranteeing safety to avoid personal injuries	

4.3. Variable Factors

4.3.1. Parameters for achieving customer's need

Customer's perceptions, competitor's performance and high competitiveness of products have become the parameters for achieving customer's need. At least three scholars (Yadav et al., 2013), (Dou et al., 2019), and (Nahm, 2013) studied these parameters. It was have found that customer's perceptions are the key for understanding customer's need (Yadav et al., 2013), (Dou et al., 2019). The QFD model was used to calculate the relative importance of different aesthetic attributes derived from the Kano Model of a car profile and its impact on customer satisfaction (Yadav et al., 2013). Similarly, customer requirements can be analyzed using a Fuzzy Kano Model (FKM) and Benchmarking theory to improve customer's satisfaction from measuring each product attributed to customer perception and competitor performance (Dou et al., 2019). The Kano Model can also be combined with Grey model to identify dynamic customer requirements and House of Quality (HoQ) to calculate the optimal improvement plan (Dou et al., 2019). With regard to competitor's performance, (Yadav et al., 2013) also addressed the same analysis as the analysis of (Dou et al., 2019), within which a competitor performance

needs also to be considered in addition to product's functionality for similar products. In more depth regarding competitor performance, (Nahm, 2013) analyzed the integration of Kano Model (using questionnaire survey, evaluation and categorizing CRs) with Benchmarking Analysis (using Company Performance Rating and Threshold pint of CRs) to oversee high competitiveness of a product.

4.3.2. Parameters for optimizing product design

Customer's satisfaction can also be determined from product design. At least eight scholars have identified four parameters for optimizing product design to satisfy customer ((Dewi & Rahaju, 2016), (Saranya & Santhi, 2016), (He et al., 2017), (Kang et al., 2018), (Kang et al., 2018), (Li & Zhang, 2021), (Tandiono & Rau, 2022)). (Dewi & Rahaju, 2016), (He et al., 2017), (Kang et al., 2018) and (Li & Zhang, 2021) considers engineering characteristics (as part of technical requirements) as an important factor to satisfy customer through optimizing product design. Other than engineering characteristics, product design optimization to satisfy customer can also be achieved by the functionality of product technology (Saranya & Santhi, 2016), by manufacturing capability (Shi & Peng, 2020) and by product development process (Tandiono & Rau, 2022).

4.3.3. Parameters for managing of quality

Other factor to satisfy customer is the management of quality. Several scholars like (Yadav et al., 2013), (Xiong et al., 2015), (Saranya & Santhi, 2016), (Ma et al., 2019), (Dou et al., 2019), (Xiangdong et al., 2022) studied several parameters for managing quality. From the studies of those scholars, quality can be managed from two ways, i.e. innovation and improvement of product attribute. Customer's satisfaction can be achieved from conceptual design (Xiangdong et al., 2022). (Saranya & Santhi, 2016) saw differently about innovation for satisfying customer which can be measured from product requirements from customers' perspectives to develop a product that creates a competitive advantage in its product market. Similarly, (Ma et al., 2019) suggested specific functions and intangible value-added services to be added in an innovation. Similar opinion to Saranya's view, (Xiangdong et al., 2022) consider customer requirements to product design is in important factor for satisfying customer because it can guide product developers to redesign product or improve the integrity and efficiency of product iterative design and innovation. In addition to innovation, satisfying customer may also be identified from the perspective of product attribute improvement. The improvement of product attribute itself for satisfying customer can be assessed through customer's perception and competitor's performance ((Yadav et al., 2013), (Dou et al., 2019)).

4.3.4. Parameters for product operations

Functionality of a product in its operations or shortly named as "product operations" is also a factor to be considered for satisfying customer. Four parameters are used by several scholars in their studies to qualify product operations ((Mansur et al., 2017), (Ma et al., 2019), (Haber & Fargnoli, 2019), (Oey & Gabriella, 2020)). According to (Haber & Fargnoli, 2019), combination of products and services functionality is one of the parameters of product operations by integrating of the customers' requirements on the targeting attributes for value

creation of products. Product operations can also be enhanced by applying scientific engineering (technology) (Ma et al., 2019) through the integration of customized consumer interactions and mass production efficiency. This would become a basis to develop new technologies and innovation other supporting services and devices. Since product operations is a key for customer's satisfaction, marketing techniques need to be advanced (Oey & Gabriella, 2020). This scholar also suggested a marketing strategy to be undertaken in light of operations management of a product to help the identification of the customer's attributes; thus improving operations management of products become important for customer's satisfaction.

4.3.5. Parameters for compliance

Compliance becomes a factor that sustain customer's satisfaction. (Mahatthanachosit & Chompu-Inwai, 2022) found that fulfillment of Government requirements and regulations for a product influences customer's preference and decision to buy such product. Customer has ultimate concern on standards certification and guarantee labelling of quality for certain products. Government set up minimum standard to be complied. According to the scholar in that research, such compliance requirement affects the buying decision of customers.

4.3.6. Parameters for after-sales service

The last factor identified is after-sales service which become parameter for satisfying customer (Ma et al., 2019), (Zhang et al., 2022). Those scholars concluded that safety concern (Ma et al., 2019) and financial value (Zhang et al., 2022) are two focus of after-sales service to satisfy customer. Failure of product is the most concern of customers of automobile products. Therefore, customers demand that after-sales service should address product failure to avoid safety issues. In this regard, quality of all services should be guaranteed at the most basic level in after-sales service activities for further product improvement. Customers also consider financial impacts of the failure of products causing safety issues such as personal injuries. For an advance automobile product such as electric vehicle (EV), defects in the products is intolerable of after-sales service is not well-provided.

4.4. Discussion

Synthesizing 24 articles which were focused on combination of Kano Model and other models, there are six variable factors to achieve customer's satisfaction on certain products (goods). Those variables are understanding customer need, optimizing product design, management of quality, product operation, compliance and after sales service.

The first factor to satisfy customers is understanding customer's need. The most important thing to understand customer's need is empathy on how the customer perceives a product, as (Dou et al., 2019) call it as taste of customer. Different from Dou's opinion, which sees the perceptions from customer side, (Yadav et al., 2013) see it which is attributed in a certain product. In other words, a product will attract (or event satisfy) customers if certain conditions attributed in such product conform with customer's perception. The degree of customer's perceptions of products itself can be explored in the Kano Methodology. In fact, (Witell et al., 2013) emphasized the correlation between attractive quality of a product and the Kano methodology. Based on the

synthesis in this paper, this first factor for satisfying customer are seen from three viewpoints, namely (1) customer's viewpoint – on their perception, (2) products viewpoint – on the conditions attributed to products, and (3) competitor's viewpoint – what perceptions of customers pertaining competitor's products.

The second factor to satisfy customers is optimizing product design. The most influencing parameters for optimizing product design are technical characteristic pf products required by customers, advancing technology, manufacturing competency or product development process. (Dewi & Rahaju, 2016) opines that the design process or technical characteristic of products need consider customer's desire. (Li & Zhang, 2021) mentioned customer's desire as customer's emotional needs that to be personalized into the design of product, especially their basic needs. The Kano model guided how the basic needs of customers can be created or event be elevated to reach some degrees of satisfaction. Specifically on products design, advancing technology is inevitable, otherwise the products will become obsolete and be left behind by new/following more advance products. The fast development of LED TV is a good example describing this parameter for the development of satisfaction of customers as deeply elaborated in the research of (Saranya & Santhi, 2016).

The third factor to satisfy customers is quality management. This factor correlates to the first and the second factors which emphasize that customer's satisfaction can be achieved through advancing innovation of product design and improving product attributes. The difference from the first and the second factors is that, this third factor, as identified in this paper, also considers intangible value-added services to products, as suggested by (Ma et al., 2019), to satisfy customers. In other words, customers expect that there should be additional values in products they bought (under the Kano Model, it is called excitement, within which customers obtain unexpected and pleasant surprise on the functionality of such products). Therefore, creating products to satisfy customer in light of the Kano Model is suggested to consider quality function deployment (Matzler & Hinterhuber, 1998).

The fourth factor that determines customer's satisfaction is how the operation of products meet customer's needs. To meet customer's need, this factor ought to fulfill two approaches, namely intrinsic approach and extrinsic approach. Intrinsic approach determines the success of product operations, mainly adopting technology in a product (Ma et al., 2019), such as in its design to meet the functionality of such product with the services expectation of customer ((Haber & Fargnoli, 2019), (Mansur et al., 2017)). This approach is applicable if customers gain new experience of a new product that they use or purchase. In addition to intrinsic approach, producer of product also needs to secure its product form external effort, i.e. marketing technique and operational management of the product (Mahatthanachosit & Chompu-Inwai, 2022). Good marketing techniques to manage the functionality of a product can convince to customers that the technology adopted by the product suits customer's need. Therefore, under the perspective of the Kano Model, combining marketing technique of a product to convince customer with providing services to make sure the functionality and operations of the product is a strength to increase satisfaction level for customers from basic need (One-dimensional level) to excitement (Attractive level).

The fifth factor is rare but can create satisfaction for specific products. It is compliance. Compliance is closely related to legal/laws and regulations which can be overviewed from procedural fairness perspective (T. R. Tyler, 1997) and psychological perspective (T. Tyler, 1996) for the goal to create a motivation in compliance through cooperation and engagement (T. R. Tyler & Jackson, 2014). At the end, the ethical commitment as the essence of compliance can be nurtured through value-based culture (T. Tyler et al., 2008). For certain products that closely relate to human health and safety, such as processed-foods and mass-transportation vehicles, compliance to legal/regulatory/governmental requirements is inevitable. Therefore, according to (Mahatthanachosit & Chompu-Inwai, 2022), identifying and communicating the fulfillment of compliance for certain products can convince the customers that in turns will create their satisfaction. The ISO 37301:2021 on Compliance Management System promulgated in the year of 2021 provides certain guidance for managing customers, but it has not been explored in detail. Figure 5 shows that studies on integrated management system is relatively rare.
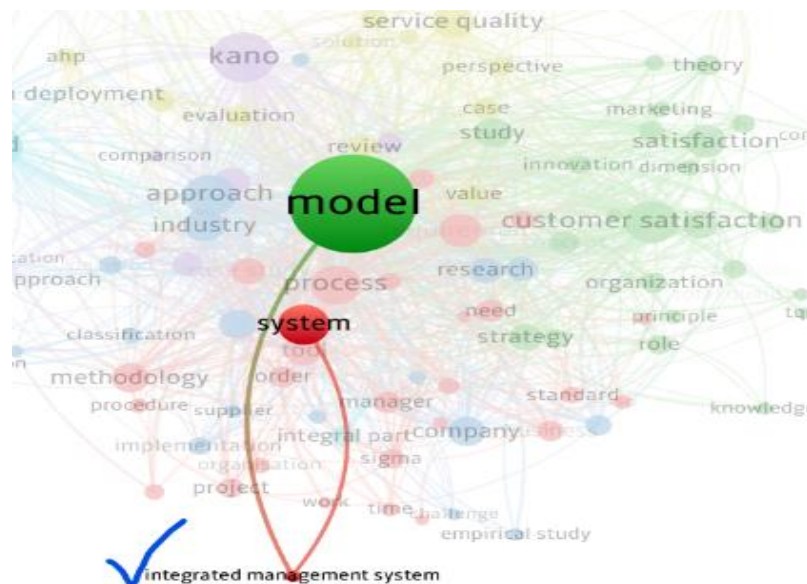

Figure 6: Research Landscape for Further Study in "Integrated Management System"

The sixth factor, i.e. after-sales service, is commonly expected by customers for their satisfaction. This factor is normally provided for certain products that are sophisticated and expensive. Again, human transportation is identified as a good example for this factor by (Ma et al., 2019) and in term of safety concern and by (Zhang et al., 2022) in term of financial considerations. Usually, an automotive manufacturer provides after-sales services for keeping the best endurance performance of a vehicle. Certain components of such vehicle are warranted in a certain period of time and maintenance services are free for certain functions. By the provision of these after-sales benefits, the satisfaction of customers can increase above their expectations. Under the Kano Model, this factor for satisfying customer is an effort to create customer's excitement level.

5. CONCLUSION

Based on the SLR using PRISMA protocol, this paper selected and analyze scholars' findings in 24 studies. The analysis of those 24 articles through a synthesize method discovered that the need to create qualified-products closely depends on the management of customer's satisfaction. The levelling of customer's satisfaction itself has been studied by numerous studies on the Kano Model. In light of the Kano Model to achieve customer's satisfaction, it is suggested that manufacturers, producers or creators of products have to consider, at least, six factors: understanding customer need, optimizing product design, management of quality, product operation/functionality, compliance, and after-sales service. By synthesizing those factors, the results of this study reveals that each of those six factors has several parameters to be followed in order that a product gains and sustains satisfaction from its customer, which is considered within the "One-dimensional" level or "Attractive" level in the Kano Model concept. Indeed, the Kano Model guides other models of quality management for the purpose of achieving customer's satisfaction. Nonetheless, the most important finding in this study is that compliance can be actually used to achieve customer's satisfaction, and therefore, compliance management for the purpose of managing product quality to satisfy customers can be considered as a novelty to be studied further.

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