

# Perancangan Atribut Pemasaran Digital Sosial Media Instagram Digital Broker Properti Menggunakan Imc Quality Dan Model Kano

## *Design Digital Marketing Attribute Social Media Instagram Digital Broker Properti Using Integrated Marketing Communication Quality And Kano Model*

1<sup>st</sup> Muhammad Ihsas AlviIbrahim  
Faculty of Industrial  
Engineering  
Telkom University  
Bandung, Indonesia  
ihsasalvi@student.telkomuni  
versity.ac.id

2<sup>nd</sup> Agus Achmad Suhendra  
Faculty of Industrial  
Engineering  
Telkom University  
Bandung, Indonesia  
agus@telkomuniversity.ac.id

3<sup>rd</sup> Ima Normalia Kusmayanti  
Faculty of Industrial  
Engineering  
Telkom University  
Bandung, Indonesia  
kusmayanti@telkomuniversit y.ac.id

### Abstrak

Properti di Indonesia masih didominasi oleh Jakarta, Jawa Barat, dan Jawa Timur. Jawa Barat masih merupakan populasi tertinggi di Indonesia. Bandung adalah salah satu kota yang paling banyak dicari untuk properti. Agen properti merupakan salah satu bidang usaha dalam industri properti. Agen properti menghubungkan pelanggan dan pemilik properti melalui penasihat properti mereka. Digital Broker Property adalah salah satu brand agen properti di Bandung, Jawa Barat. Badan ini telah dikaitkan dengan AREBI. Hubungan asosiasi ini merupakan salah satu strategi branding mereka. Namun, branding dalam asosiasi hanya berhubungan dengan perusahaan besar. Broker Properti Digital seharusnya membuat media sosial untuk meningkatkan branding mereka. Namun, Instagram belum dimanfaatkan dengan baik karena

platform ini menjangkau hampir 88% penduduk Indonesia. Oleh karena itu, atribut kebutuhan pelanggan untuk media sosial ini diidentifikasi menggunakan wawancara dan survei. Ada 19 atribut untuk Instagram dalam 5 dimensi berbeda. Dimensi tersebut adalah Content Marketing, Interactivity, Cross Functional Planning, Strategic Consistency, dan Resource Commitment. Atribut-atribut tersebut diukur dengan menggunakan IMC Quality dan Kano Model. Nilai Kepuasan Pelanggan ditentukan dengan menggunakan metode IMC Quality.

**Kata kunci :** *Instagram, Branding, IMC Quality, Model Kano, Integrasi*

### Abstract

*Property in Indonesia is still dominated by Jakarta, West Java, and East Java. West Java is still the highest population in Indonesia. Bandung is one of the most searched city for property. Property agency*

is one of the business area in property industry. Property agency links customers and property owners through their property advisors. Digital Broker Property is one of the property agency brand in Bandung, West Java. This agency has been associated with AREBI. This association relationship is one of their branding strategy. However, branding in association only relate to great companies. Digital Broker Properti should have create the social media to increase their branding. However, Instagram has not been used properly as this platform reached almost 88% of Indonesia's population. Therefore, customer needs attributes for this social media are identified using interview and survey. There are 19 attributes for Instagram in 5 different dimensions. Those dimensions are Content Marketing, Interactivity, Cross Functional Planning, Strategic Consistency, and Resource Commitment. Those attributes is measured using IMC Quality and Kano Model. Customer Satisfaction Value is determined using IMC Quality method.

**Keywords :** Instagram, Branding, IMC Quality, Kano Model, Integration

#### I. PRELIMINARY

In Indonesia is an archipelago nation in Southeast Asia. There are about 17,508 islands in an area of 1,919,443 km<sup>2</sup>. Five islands are the major islands, they are Borneo (Kalimantan), Java, Sulawesi, Sumatra, and Papua [1]. Currently, Indonesia has 34 provinces with 514 districts or cities spread all over provinces. In 2020, Indonesia's population reached over 270,20 million people. This number is 1.07% growth from the previous year [2]. Even though the population growth rate has declined from the past ten years, a spike in the growth rate is potential as the Z-Generation (people who were born in 1997-2012) is predicted to enhance Indonesia's demographic dividend. According to Badan Pusat Statistik, there are 74,93 million Z-Generations or 27,94% of the current Indonesia population.

Population  
Composition Based on  
Generation 2020

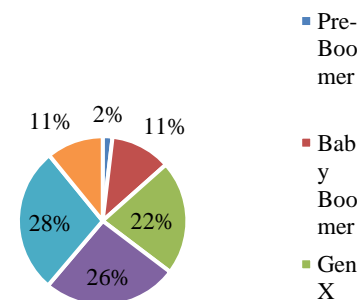


Figure 1. Population Composition Based on Generation 2020

The demographic dividend is a phenomenon in which the productive age of a nation is higher than the non-productive age. Indonesia is expected to relish this phenomenon from 2020-2035 [3]. This phenomenon either impacts positively or negatively to the nation economically depending on how successful Indonesia handles demographic dividend for development strategy. Obviously, Z-Generation will significantly increase the availability of labor in Indonesia. Skilled workforce is one of the triggers to raise any industry growth in this developing country [4].

West Java is the most populated province in Indonesia, followed by East Java, Centre Java, North Sumatra, Banten, and DKI Jakarta [5]. Over 49 million people in West Java spread across 26 cities and districts. West Java contributes 30% national supply housing property, the second highest after DKI Jakarta. West Java also has the most industrial area in Indonesia. Industrial area is one of the potential trigger property growth [6]. Currently, there are thirty-two industrial areas, twelve in Karawang, nine in Bekasi, four in Purwakarta, two in Bogor, and one area in Majalengka, Subang, Sukabumi, and Sumedang.

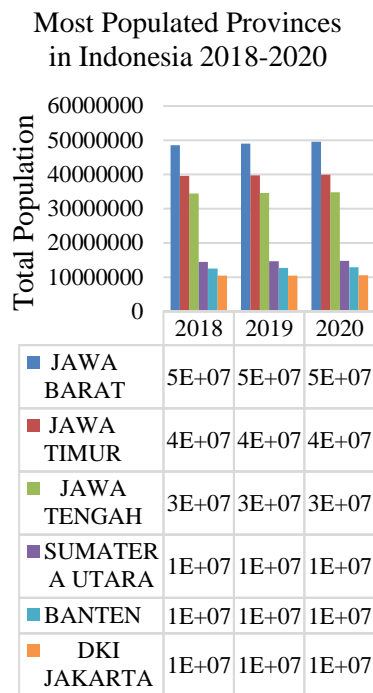
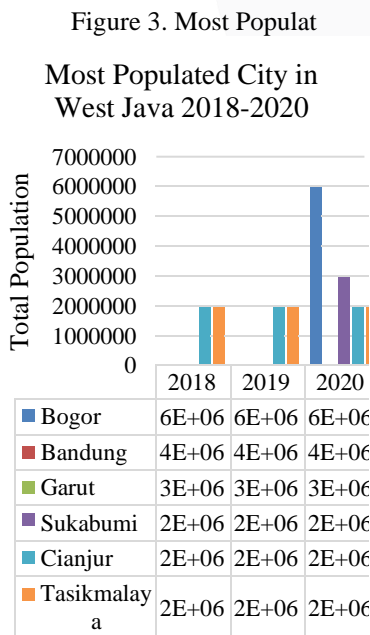


Figure 2. Most Populated Provinces in Indonesia 2018-2020 Chart

As of 2018, Bandung has been the second most populated city in West Java. Bandung is a home for more than 3 million people. Even though the housing property in Bandung is not as much as in Bogor, as the second most populated city in West Java, housing in Bandung is the highest searched on the website (Rumah,2020).



City in West Java 2018-2020

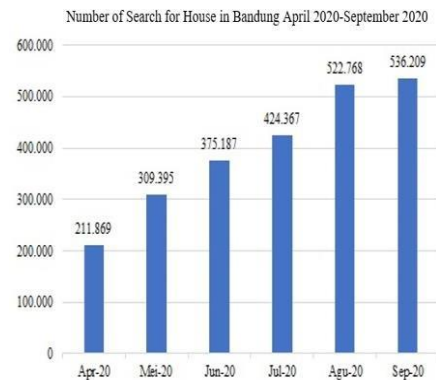


Figure 4. Number of Search for House in Bandung April-September 2020

As well as other industries, the property industry undergoes a digital transformation. Digital marketing activity in this industry has begun from the marketplace in the form of websites. Marketplace unites people who are interested in a product or service and people who offer the product or service. Branding becomes a struggle to grow and develop in the marketplace as customers tend to find their needs in minimum price and highest quality [7].

PT. Prabu Mega Properti is a developer company, contractor, and property agency. Digital Broker Properti is their marketing service brand or known as property agency. Property agencies provide property advisors for property owners (corporation or personal). This property agency links customers to property owners through their property advisor. The Digital Broker Properti brand has already been listed in Association of Real Estate Indonesia or *Asosiasi Real Estate Indonesia* (AREBI). This association is for branding property agencies to large development companies such as Ciputra Development, Summarecon, Agung Podomoro Land, etc. However, not all development companies, property owners, or even customers rely on this association or property agency. Therefore, property agencies should have developed their branding, especially Digital Broker Properti. Digital Broker Properti already has official websites and email as their online presence. Website marketplace is their main platform to promote the property.

ed

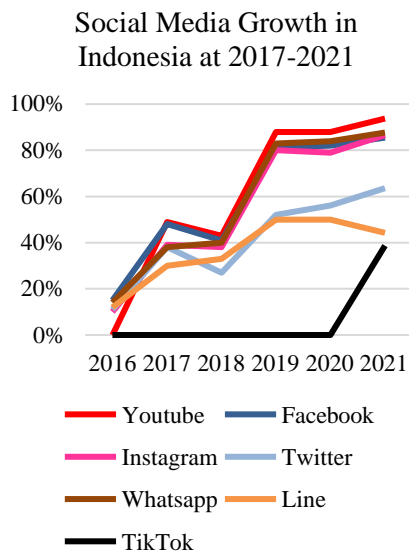


Figure 5. Social Media Growth in Indonesia at 2017-2021

Nowadays, any business unit or company creates social media accounts to introduce their product or service brand, reach more people and customers, improve their brand loyalty and trust, and other marketing objectives. It shows us the growth of social media in Indonesia since five year ago. Instagram has reach more than 87% users from Indonesia in 2021 along with Youtube, Whatsapp, and Facebook. However, Instagram has potential ability to reach almost 85 million people in Indonesia [8].

However, respondent interest for property in Instagram is quite high. This survey indicates that there are potential customers on Instagram for property. In Figure 10. shows us the overall selling from March to August 2021. There was a rapid sales growth in April and May but began to decline in June. Even though it slowly inclines until August, selling is vulnerable due to limited buying power of customers. This indicates that Digital Broker Properti also needs branding to customers.

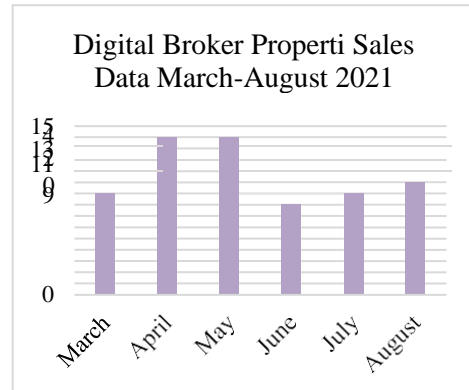


Figure 6. Digital Broker Sales Data in March-August 2021

However, Digital Broker Properti has not yet developed their digital presence in social media. Especially Instagram, one of the most potential social media in Indonesia. Therefore, this research aims to identify needed attributes to establish branding in Instagram for Digital Broker Properti using Integrated Marketing Quality. Also, this research intends to design the True Customer Needs attribute based on integration of the Kano model and Integrated Marketing Quality. The recommendation and suggestion of attributes is presented as reference for Instagram Digital Broker Properti.

## II. LITERATURE REVIEW

### a. Digital Marketing

Digital marketing manages various forms of company's online existence. There are various platforms using different techniques to achieve marketing objective. Commonly, there are three type of media channels. They are paid media, owned media, and earned media. Paid media is an effort of investment for reach the visitor or conversions through advertising network or affiliate marketing. Owned media is an online presence owned by a brand or company such as Facebook account, Instagram, Website, Email, etc. Earn media is what brand or company gained without directly paying it. Usually it comes from word-of-mouth, repost, shares, reviews, or viral [9].

### b. Social Media and Social Network

Social media is a platform for people to interact with each other. Main function of social media is communication with other. However, this platform is beneficial for marketing activity. In marketing activity, social media used to reach, act, convert, and engage with customer [9].

### c. Facebook

Facebook created by Mark Zuckerberg along with Dustin Moskovitz, Chris Hughes, and Eduardo Saverin in 2004. First emerge of Facebook was intend to connect Harvard student with one another. Facebook is the online platform for people to share photo, share video, and online chat. People like the feature Facebook offer so it expanded rapidly to Boston area, Ivy League, and by the end of 2004, a million people active on Facebook. In 2012 and 2014, Facebook announce acquisition of Instagram and Whatsapp. Now, Facebook have many features and become the world-wide social media and the most used social in past few year [10].

### d. Youtube

Youtube founded by Steve Chen, Chad Hurley, and Jawed Karim and registered in 14 February 2005. This social media serves free video-sharing for everyone. In the end of the year, Youtube had two million video views per day. The unpredicted growth of Youtube leads to the need of capital. In November 2006, Google bought Youtube for \$1.6 billion and Youtube become Google's child-company. Today, Youtube become the second most used social media in the world [11].

### e. Whatsapp

WhatsApp Inc. founded by Jan Koum and Brian Acton in 2009. The first version of this application was made for SMS and MMS. There is no advertising in WhatsApp. In February 2014, WhatsApp had been bought by Facebook for \$19 billion. Nowadays, WhatsApp become popular for online chatting, voice call, video call and reach the third most used social media in the world [12].

### f. Instagram

On 6 October 2010, Kevin Systrom and Mike Krieger launch Instagram. Instagram was created only for photo sharing. Also, Instagram was only accessed by Apple user only. In the end of the year, Instagram reach 1 million users. Two years later, Instagram launched in Android and Facebook bought Instagram. Nowadays, Instagram become the fourth most used social media with highest engagement, suitable for any brand or company [13].

### g. Statistical Inference

Statistical inference is used to analyze partial data (sample) and draw the conclusion based on partial data. There are two methods in hypothesis testing. They are parametric and non-parametric. The parametric method is a technique to test the sample based on assumption that the sample are from normal population. The type of data used in parametric method is interval or ratio. The nonparametric method is a technique to analyze the ordinal or nominal data without considering the data distribution. In nonparametric, there is no assumption that the sample are from normal population [14].

### h. Normality Test

In parametric method, normality test is used to measure the data spread. Whether it is distributed normal or not. The normal distributed data has mean, median, and mode in central tendency [15]. Minimum amount of sample used for normality test is more than equal to 30 elements [16]. There are many variations of normality test, they are Chi-Square, Skewness-Kurtosis, Lilliefors, and Kolmogorov-Smirnov. In this research, Kolmogorov-Smirnov is used [17].

$$"Z" = (X_i - \bar{X}) / SD$$

Where :

Z = Transformation from number to notation in normal distribution

X<sub>i</sub> = Data

SD = Standard Deviation

### i. Validity Test

Validity test is used to determine whether the instrument are valid or not [18]. The validity uses correlation coefficient Pearson (r) should be used for normal distribution observation. Correlation coefficient Spearman-rho (ρ) or Kendall-tau (τ) should be used for not normal distribution observation [19]. Kendall-tau is used for the same subject, therefore this research used Spearman-rho as the validity test. The following formula of Spearman-rho is as follows [20]:

$$r_s = 1 - \frac{\sum d_i^2}{n(n^2 - 1)}$$

r<sub>s</sub> = Spearman-rho

d<sub>i</sub> = Difference between two rankings

n = Number of sample

### j. Reliability Test

Reliability is a consistency on each attributes score and accuracy on research instrument. The proper consistency test is

Cronbach Alpha or alpha coefficient [21].  
Alpha coefficient score are :

- 0 = no reliability
- > 0.70 = Acceptable reliability
- > 0.80 = Good reliability
- > 0.90 = Excellent reliability
- 1 = Perfect reliability

k. Previous Research

There are several previous researches on IMC Quality for design of digital marketing attributes. The previous research has inspired authors to find other dimensions to design digital marketing attributes on different objects. However, the research has used different integrated marketing quality dimension. There are Interactivity, Content Marketing, Visual Communication Design, Information Quality, Message Consistency. Meanwhile, this research using Content Marketing, Interactivity, Strategic Consistency, Cross-Functional Planning, and Resource Commitment.

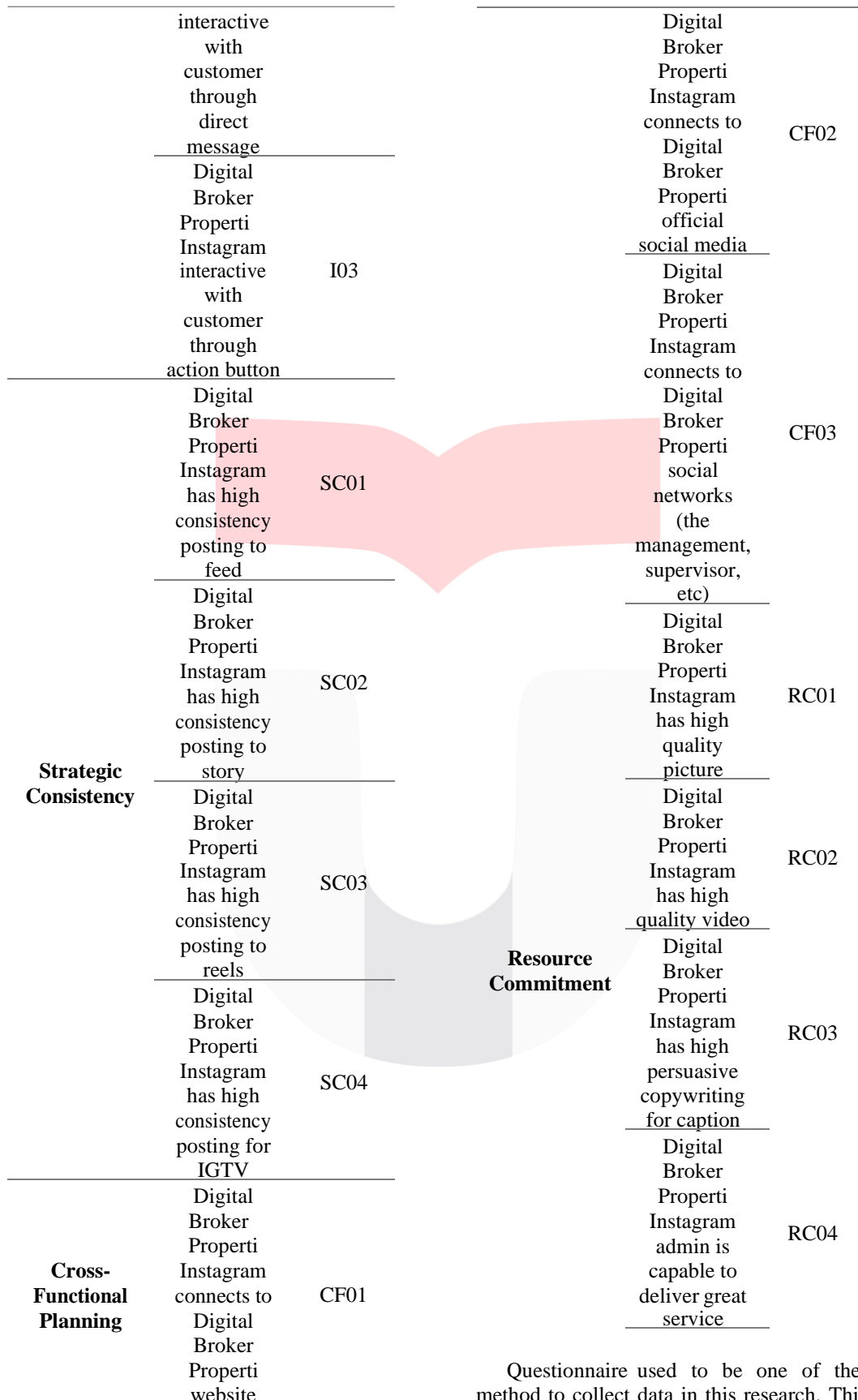
III. METHOD

The initial step of this research is to do preparation. It is conducted by having an interview with some stakeholders of marketing activity in Properti Digital Broker Properti. Those stakeholders are property advisor, marketing staff, marketing management, and property buyer. Afterwards, introduction survey is conducted. From the interview and survey, the problem is identified, formulated, and methodology is determined by literature review.

Afterward, needs attributes are identified to obtain information of Instagram user needs. Identification process is conducted by finding voice of customer conducted in order to obtained the attribute by in-depth interview. In-depth interview question is related to IMC Quality dimension. The point of question is all about needs attribute in digital marketing of Digital Broker Properti. The result of needs attribute interview is classified into IMC Quality dimensions using Affinity Diagram. This technique converts informal statement to understandable, formal, and structured sentence. In each dimension, attribute needed for digital marketing in Instagram is determined. Determination of each attribute is based on previous research and voice of customer.

Table 1. Attributes in Each Dimension

Dimension	Attribute	Code Symbols
Content Marketing	The content of Digital Broker Properti Instagram is entertaining for customer	CM01
	The content of Digital Broker Properti Instagram is educating for customer	CM02
	Digital Broker Properti Instagram available for any event about property and real estate	CM03
	Digital Broker Properti Instagram is an open source of product knowledge of real estate	CM04
	Digital Broker Properti Instagram delivers news and information about property	CM05
Interactivity	Digital Broker Properti Instagram interactive with customer through comment	I01
	Digital Broker Properti Instagram	I02



Questionnaire used to be one of the method to collect data in this research. This technique is efficient way to measure research variable. Respondent criteria have

determined for this research. The result of the questionnaire is tested using Kolmogorov-Smirnov for Normality Test

In this research, the 30 first data of the questionnaire is measured in SPSS. After input the data into SPSS, we have to rename each attribute data. We go to Analyze > Nonparametric Test > Legacy Dialog > 1-Sample K-S. K-S stands for Kolmogorov-Smirnov. Then, attribute data measured is moved to the right (Test Variable List) and make sure the normal checkbox is ticked. There will be a new window appear. It is the result of normality test. In this research, the 30 first data and the total of each n is measured in SPSS. We go to Analyze > Correlate > Bivariate. Then, all of the attribute is moved to the right (Variable) and make sure the Spearman checkbox, two-tailed, and flag significant are ticked. There will be a new window appear. It is the result of correlation Spearman-rho test.

In SPSS, we go to Analyze > Scale > Reliability Analysis. Then, we move all the attribute to the right (excluding the attribute total), choose Alpha model, and click Ok. The result of reliability test and it is a good reliability as the Cronbach Alpha value is more or equal than 0.8.

Samples are people who are represents a population [14]. Sampling technique is the process to determine sampling size. Sampling size is the amount of samples used in a research. This research using simple random sampling. Simple random sampling is the technique in which every element is selected independent. Slovin's formula is used to determine sample size (n). The formula requires total population (N) and error probability ( $\epsilon$ ). In this research, total population in Bandung at 20-50 years old is 1161296 people. According to Khadka, acceptable margin error for social research is 10% [22]. Slovin formula is used to determine the sample size for this research. Therefore, sample size for this research is 100 people.

Questionnaire is deployed through social media groups and personal chat to related people who meet the criteria. This questionnaire uses Google Form. There are two types of questionnaire, the IMC Quality and Kano Model questionnaire. IMC Quality questionnaire and Kano Model questionnaire are integrated to each category attributes. The result of this integration shows us which attribute classified as prioritized, developed, or ignored.

#### IV. RESULTS AND DISCUSSION

##### a. Identify Attribute with Integrated Marketing Quality

IMC Quality was designed using Likert scale. Likert scale category consist of 1 until 5, where 1 represents very disagreement and 5 represents very agreement. Average weighting of Likert-scale data must be calculated. After that, each attribute will have Customer Satisfaction Value (CSV). The CSV defines attribute category, whether it is strong or weak. The definition is generated by having the average of CSV and compared it to each attribute's CSV. If the attribute's CSV more than the average of CSV, that attribute is categorized as strong attribute. If the attribute's CSV less than the average of CSV, that attribute is categorized as weak attribute.

Importance Variable generates the Customer Satisfaction Value (CSV) for each attribute. Then, all attribute's CSV is averaged. The attribute that has exceed than the average of CSV is classified as strong attribute. In the integration of IMC Quality and Kano Model, the strong attributes are categorized as "prioritized". The following table is a list of strong attributes. The attribute that has less than the average of CSV is classified as weak attribute. In the integration of IMC Quality and Kano Model, the weak attributes are categorized as "developed" if those attribute is categorized as Must-Be, One dimensional, or Attractive in Kano model. If those attribute is categorized as Indifferent, therefore the attribute categorized as "ignored". The following is a list of weak attributes.

##### b. Categorize Attribute with Kano Model

Kano model questionnaire aims to categorized each strong and weak attributes into Kano Model category. This questionnaire has two parts, functional and dysfunctional. The result from this questionnaire will be classified into Kano's evaluation table using Blauth's Formula.

The Must-Be category is the basic attribute in digital marketing. These attributes will dissatisfy customer if these attributes do not meet customer needs. However, if these attributes have met customer needs, it does not even satisfy customer. The Must-be attributes categorized as developed or prioritized for digital marketing Instagram attributes.

The One-dimensional attributes are determinant of customer satisfaction. These attributes will dissatisfy customer if these attributes do not meet customer needs. These attributes will satisfy customer if these attributes met customer needs. The One-dimensional attributes categorized as developed or prioritized for digital marketing Instagram attributes.

The Indifferent category is just a standard category in digital marketing. Whether this attributes exist or not, customer does not feel satisfied or dissatisfied. The Indifferent category in this research is Reels feature consistency.

c. Instagram Design Recommendation

There are 19 customer needs attributes divided into 5 different dimensions identified to design the Instagram for Digital Broker Properti.

Table 2. Design True Customer Needs of Instagram Digital Broker Properti

No	Attribute Code	Attribute Name					
1	CM01	The content of Digital Broker Properti Instagram is entertaining for customer	Prioritized	8	RC04	Digital Broker Properti Instagram admin is capable to deliver great service	Developed
2	CM02	The content of Digital Broker Properti Instagram is educating for customer		9	CM05	Digital Broker Properti Instagram delivers news and information about property	
3	CM03	Digital Broker Properti Instagram available for any event about property and real estate		10	I01	Digital Broker Properti Instagram interactive with customer through comment	
4	CM04	Digital Broker Properti Instagram		11	I02	Digital Broker Properti	
				5	RC01	Digital Broker Properti Instagram has high quality picture	
				6	RC02	Digital Broker Properti Instagram has high quality video	
				7	RC03	Digital Broker Properti Instagram has high persuasive copywriting for caption	
						is an open source of product knowledge of real estate	

		Instagram interactive with customer through direct message		official social media
12	I03	Digital Broker Properti Instagram interactive with customer through action button		Digital Broker Properti Instagram connects to Digital Broker Properti social networks (the management, supervisor, etc)
13	SC01	Digital Broker Properti Instagram has high consistency posting to feed	<p>The result of integration IMC Quality and Kano Model classify which attributes strongly prioritized and developed. The rest of other attributes also important but does not pay attention for specific niche. Educational, Entertaining, Product Knowledge and Live event content are the most preferable type of content for Instagram. The education content is. The dimension of quality resource involving great quality resource of photo, video, caption, and the admin capability are expected to be in Digital Broker Properti Instagram.</p>	
14	SC02	Digital Broker Properti Instagram has high consistency posting to story		
15	SC04	Digital Broker Properti Instagram has high consistency posting for IGTV		V. CONCLUSION
16	CF01	Digital Broker Properti Instagram connects to Digital Broker Properti website		This study has identified customer needs attributes of digital marketing in Instagram according to integrated marketing communication quality dimensions. There are nineteen customer needs attributes for Instagram Digital Broker Properti obtained in this research according to five integrated marketing communication quality dimensions. Customer satisfaction value represents the strength of these attributes with customer interest of an Instagram account. There are 8 strong attribute and 11 weak attribute. Based on Kano model, there are three different attribute category identified. There Must-Be, One Dimensional, and Indifferent. The result of integration of IMC Quality and Kano Model are the True Customer Needs. There are eight attribute prioritized for Instagram digital broker properti, ten attribute could be developed later, and one attribute could be ignored.
17	CF02	Digital Broker Properti Instagram connects to Digital Broker Properti		REFERENCES
				[1] Embassy Of The Republic of

- Indonesia, "Facts & Figures." <https://www.embassyofindonesia.org/basic-facts/>.
- [2] Badan Pusat Statistik, "Hasil Sensus Penduduk 2020," 2021. <https://www.bps.go.id/pressrelease/2021/01/21/1854/hasil-sensus-penduduk-2020.html>.
- [3] A. N. Sutikno, "Bonus Demografi Di Indonesia," *VISIONER J. Pemerintah. Drh. di Indones.*, vol. 12, no. 2, pp. 421–439, 2020, [Online]. Available: <http://ejournal.goacademica.com/index.php/jv/article/view/285>.
- [4] B. L. Lowell and A. Findlay, "Migration of highly skilled persons from developing countries: Impact and policy responses," *Int. Migr. Pap.*, vol. 44, no. January, pp. 1–41, 2001.
- [5] Badan Pusat Statistik, "Jumlah Penduduk Menurut Kabupaten/Kota (Jiwa), 2018-2020," 2021. <https://jabar.bps.go.id/indicator/12/133/1/jumlah-penduduk-menurut-kabupaten-kota.html> (accessed Aug. 30, 2021).
- [6] Rumah.com, "Rumah.com Indonesia Property Market Index Q2 2021," 2021. <https://www.rumah.com/panduan-properti/rumahcom-indonesia-properti-market-index-q2-2021-46982>.
- [7] D. Holt, "Branding in the Age of Social Media," 2016. <https://hbr.org/2016/03/branding-in-the-age-of-social-media> (accessed Sep. 07, 2021).
- [8] We Are Social; Hootsuite, "Digital 2021 Indonesia," 2021. [Online]. Available: [https://datareportal.com/?utm\\_source=Reports&utm\\_medium=PDF&utm\\_name=Digital\\_2021&utm\\_content=DataReportal\\_Promo\\_Page](https://datareportal.com/?utm_source=Reports&utm_medium=PDF&utm_name=Digital_2021&utm_content=DataReportal_Promo_Page).
- [9] D. Chaffey and F. Ellis-Chadwick, *Sixth Edition Digital Marketing: Strategy, Implementation, and Practice*. 2016.
- [10] Facebook, "Our History." <https://about.facebook.com/company-info/>.
- [11] W. L. Hosch, "Youtube," 2009. <https://www.britannica.com/topic/YouTube>.
- [12] A. Pahwa, "The History Of WhatsApp," 2021. <https://www.feedough.com/history-of-whatsapp/>.
- [13] I. Mottola, "The History of Instagram," 2016. <https://medium.com/@ignaziomottola/the-history-of-instagram-ff266eb75427>.
- [14] R. E. Walpole, R. H. Myers, S. L. Myers, and K. E. Ye, *Probability and Statistics for Engineers and Scientists, 9th Edition*. Pearson Education Limited, 2017.
- [15] Nuryadi, T. D. Astuti, E. S. Utami, and M. Budiantara, *Buku ajar dasar-dasar statistik penelitian*. 2017.
- [16] Sugiyono, *Memahami Penelitian Kualitatif*. Bandung: ALFABETA, 2012.
- [17] A. Hidayat, "Pilihan Uji Normalitas Berdasarkan Software-Jumlah Sampel," 2014. <https://www.statistikian.com/2014/08/pilihan-uji-normalitas-univariate.html>.
- [18] N. M. Janna, "Konsep Uji Validitas dan Reliabilitas dengan Menggunakan SPSS," *Artik. Sekol. Tinggi Agama Islam Darul Dakwah Wal-Irsyad Kota Makassar*, no. 18210047, pp. 1–13, 2020.
- [19] S. Nugroho, S. Akbar, and R. Vusvitasari, "Kajian Hubungan Koefisien Korelasi Pearson ( $r$ ), Spearman-rho ( $r_s$ ), Kendall-Tau ( $\tau$ ), Gamma ( $G$ ), dan Somers," *GRADIEN J. Ilm. MIPA*, vol. 4, no.

- 2, pp. 372–381, 2008, [Online]. Available: <https://ejournal.unib.ac.id/index.php/gradien/article/view/279>.
- [20] A. Hidayat, “Uji Spearman dengan Excel dan Cara Hitung,” 2013. <https://www.statistikian.com/2013/02/spearman-rho-excel.html>.
- [21] D. Budiastuti and A. Bandur, *Validitas dan Reliabilitas Penelitian*. 2018.
- [22] D. J. Khadka, “Sampling Error in Survey Research,” *Int. J. Sci. Res.*, vol. 8, no. 1, pp. 2214–2220, 2019.

