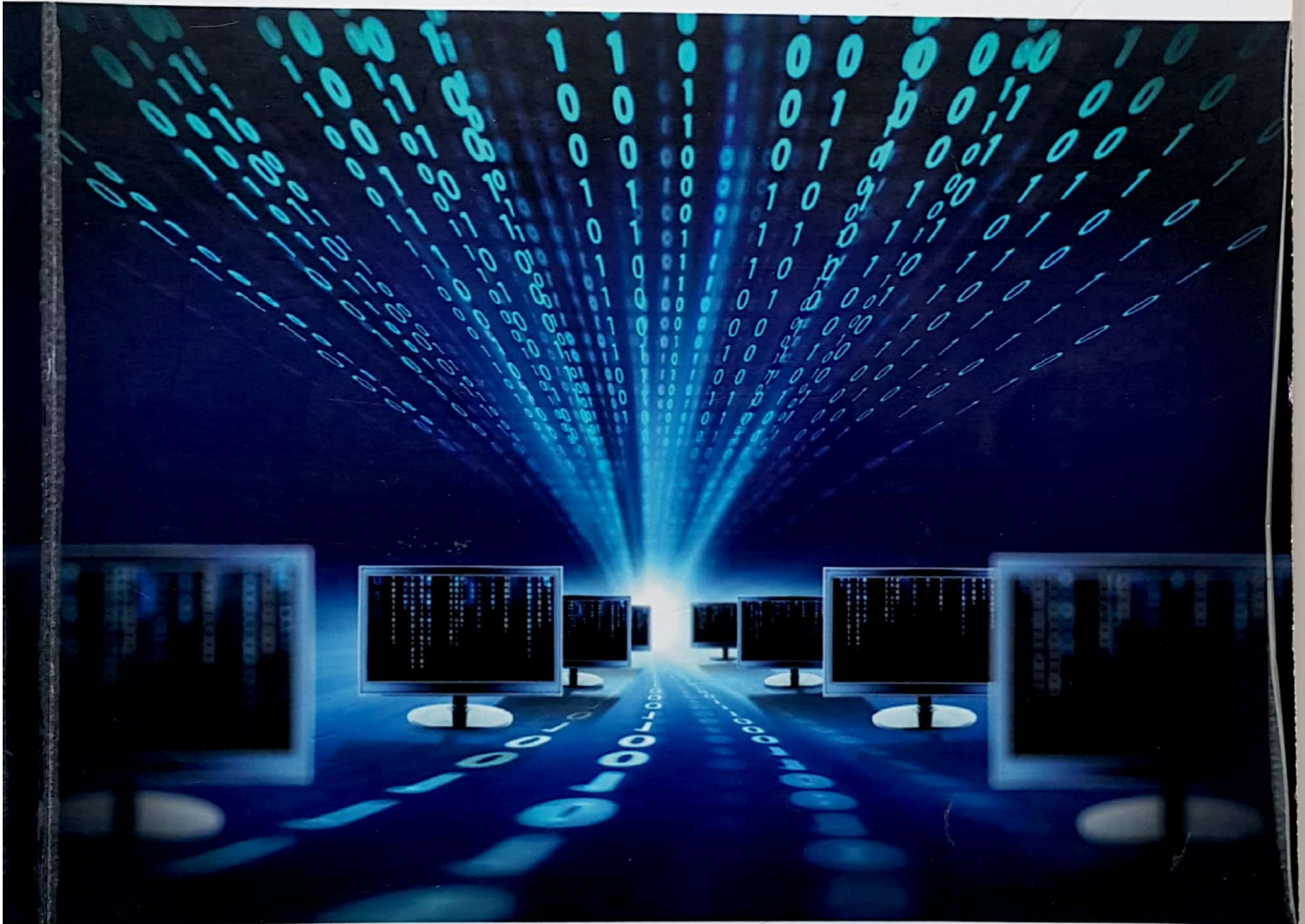


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# Big Data and Analytics for Business:

## *A Multi-Disciplinary Perspective*



***Editors:***

**Surabhi Pandey & Saurabh Mittal**

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## ***A Multi-Disciplinary Perspective***

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# **Big Data and Analytics for Business:**

## ***A Multi-Disciplinary Perspective***

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## Preface

Today's dynamic business environment is challenging. To support it, you need a cost-effective, agile IT infrastructure to drive new services and applications to market more quickly. But setting up and maintaining your own IT infrastructure to meet these needs can mean high up-front capital expenses and operational costs as well as poorly utilized infrastructures that are difficult to reallocate in response to unpredictable or intermittent workloads. Application development and test activities often suffer from insufficient test environments, resulting in prolonged development cycles and quality issues. Cloud computing can help you cope with these challenges, but you need a cloud infrastructure that offers enterprise-class flexibility, security, reliability and control.

Recognized as one of the Top 10 technologies of 2010 by Gartner, Cloud Computing has generated a lot of interest and competition in the industry. With the emergence of new Cloud Providers, identifying one that best suits the business needs of an enterprise is a challenging and difficult task. Adopting a Cloud Provider requires a detailed study of parameters like data security, SLA's and options that address the reduction of capital expenditure. In this book, we have included chapters with a discussion and comparison of the significant features for Cloud Computing Service Providers and key considerations that enterprises need to take into account while they embark on Cloud Computing.

For most small to medium enterprises it may not make sense to have expensive IT personnel in-house given their scale of operations. Even if these resources are available, they may not be available 24x7 to resolve the IT needs of organisation in a timely and efficient manner. Also, IT personnel do require a level of strategic oversight that organisations would rather devote to their core business. With a virtualization, data centre outsourcing and analytical modeling present a new domain for the organisations to take their informed decisions.

Modern Computing is not confined to data analytics and business intelligence, rather it encompasses the development of algorithms and business logics for resolving the requirements of the business managers. A host of services like Data Virtualisation, Cloud Computing and Big Data Cloud may appear to be fresh technology still in the Indian scenario but it has firm foundations today in the business firms. The Indian cloud computing market which stands at \$200 million may grow almost five times to reach over \$1 billion by 2016. Several multinationals and Indian companies are entering the cloud space and trying to drive business relevance of its solutions for Indian customers. India has a legacy of jumping technology curves. The precedent exists in the telecom sector and now DTH is also witnessing transformation. It is expected that cloud would also show the similar behavior. The companies that are currently not adopting IT and don't have major investments in datacenters and server farms are expected to shift directly to the cloud model. There are ample opportunities in every industry. Verticals such as retail, manufacturing, banking, education, and healthcare will rely upon cloud



services for better reach. The key themes for most opportunities are cloud, mobile, market place, price discovery, collaboration and analytics.

It is essential for companies to come forward and enable collaborative innovation to address both India and global market needs. The key focus should now be on developing the ecosystem. It should include developing talent for cloud development, connecting start up ISVs with large system integrators, enabling start ups on the cloud market places and finally, influencing government policies to become cloud friendly. This ecosystem together with Indian capabilities of exporting business models can provide the right mix to leverage opportunities created by cloud. Consider the sheer volume of data and the many different formats of the data (both structured and unstructured data) collected across the organizations and the many different ways and categories of data that can be combined, contrasted and analyzed to find patterns and other useful information. The first challenge is in breaking down data silos to access all data an organization stores in different places and often in different systems. A second big data challenge is in creating platforms that can pull in unstructured data as easily as structured data. This massive volume of data is typically so large that it's difficult to process using traditional database and software methods. The present book volume is an attempt to consider the various technical challenges and the business opportunities in the area of Big Data and Analytics. The emphasis is not only on the theory, but also to see the best industry practices in the domain.

There are few concerns with the adoption of new technologies as well. Data security and lack of control on IT environment are the key concerns for the IT Experts and Business Managers equally. Like any technological or business process transformational initiative, cloud implementation also faces internal resistance to change as it alters the structure and working patterns of IT organization.

We have taken due care in selection of the quality submissions, their review and aligning them to the central theme of the book. We sincerely hope that this edited book shall provide a comprehensive and structured view of different aspects of big data, analytics and its applications in business, to the researchers, students, practitioners and the strategists from the corporate. The discussions from both the technical and business backgrounds will serve as a good reference to the readers.

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## E-COMMERCE MARKETPLACE USAGE BY ONLINE SHOPPERS IN INDONESIA: REASONS AND BARRIERS (CASE STUDY IN TOKOPEDIA.COM)

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### Abstract

*Increasing in demand, directly affect the development and innovation in a variety of systems. For example in trading system. We do not necessarily have to go to the store or supermarket to buy product that we need. E-commerce or well known as online shopping site has begun to develop in Indonesia. For Indonesian people who live in remote areas do not need to go to the city to buy a desired product, because online payment system and expedition delivery is now available. Tokopedia is one of the biggest online shopping website Indonesia. Tokopedia can be accessed free either by the seller or buyer. In this study the researchers want to find out the reasons and barriers faced by buyers when transacting in Tokopedia. The study has also been conducted to find out whether there is any relation between age and product variations, age and easy payment, job and product variations, job and easy payment. The data obtained by sending a questionnaire to the respondents via Tokopedia Message. The data which is complete and can be further processed are 447 respondents. To describe the reasons and barriers faced by consumers, the researcher use statistical descriptive analysis, and for hypothesis testing is by using chi-square.*

**Keywords:** E-Commerce, Online Shoppers

### 1. Introduction

Time grow fast and modernisation also push a wide range of changes to the system, direct or indirectly. For example in trading system, how to trade and marketing systems. The traditional way when we want to buy a product or item, we must go to store and meet the seller, buyer and seller must be face to face which is also called as transaction. Range between seller and buyer is very limited.

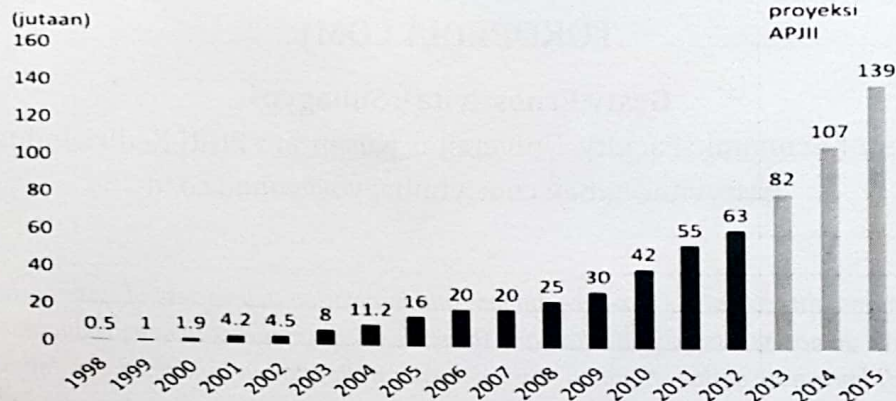
Nowadays, as the growth of technology, especially internet, all the limitations of distance, time, and costs can be resolved easily. One of the technology implementation in terms of improving the business, sales and purchase of a product is by using electronic commerce (e-commerce), to sell and buy a variety of products or services, both in physical and digital form.

Electronic Commerce is a new concept that can be described as the process of buying and selling goods or services on the World Wide Web Internet or the process of buying and selling or exchange products, services and information over the network information, including the internet (Suyanto, 2005).

In Indonesia the number of Internet users has been increased from year to year, and according to projections from APJII (Association of Indonesian Internet Service Provider) the number of users will continue to increase from year to year. The following chart shows the internet users in Indonesia:



## Indonesia Internet Users



The increasing number of internet users attract bussiness people to sell their product in the internet or online. Millions people around the world searching for and buy goods they need through internet. Internet able to affect all sectors of business, from the large scale company to the small online shop also take advantage of using internet to product branding, marketing, product sales or other business functions.

One of the biggest e-commerce marketplace bussiness in Indonesia is Tokopedia.com. Since its launch in 2009 until the end of 2015, Tokopedia basic services could be used by everyone for free. Tokopedia.com have a vision "Building a Better Indonesia Through Internet", Tokopedia has a program to support Micro, Small and Medium Enterprises (SMEs) bussiness and individuals to expand their business by marketing products online.

Since it officially launch, Tokopedia become one of the popular Indonesian Internet companies with the highest growth. Based on that reasons, researcher attract to conduct research entitle "E-Commerce Marketplace Usage by Online Shoppers in Indonesia: Reasons and Barriers (Case Study in Tokopedia.com)."

## 2. Objectives of The Study

Based on the background of the study, the research was conducted with the following objectives:

- To describe the reasons why consumers buy product in Tokopedia.
- To describe problems faced by consumers in purchasing product in Tokopedia.
- To analyze relation between age and product variations.
- To analyze relation between age and easy payment.
- To analyze relation between job and product variations.
- To analyze relation between job and easy payment.

## 3. Literature Review

Laudon (1998) define E-Commerce as a process of buying and selling of electronic products by consumers or from company to company with a computer as an intermediary for business transactions. E-Commerce is a business exchange routine by using a transmission called Electronic Data Interchange (EDI), e-mail, electronic bulletin boards, fax machines, and Electronic Funds Transfer related to Internet shopping transaction, stock and bonds online, download and sale of software, documents, graphics, music, and others, as well as transactions Business to Business (B2B).

While David Baum (1999, pp. 36-34) define E-Commerce as a dynamic set of technologies, applications, and bussines process that links enterprises, consumers, and communities through electronics transactions and the electronic exchange of goods, services, and informations.



Definition of E-Commerce by Kalakota and Whinston (1997) can be reviewed in the following four perspectives:

- a. From the perspective of communication, E-Commerce is the delivery of goods, services, information, or payments over a computer network or via other electronic equipment.
- b. From the perspective of business processes, E-Commerce is the application of technology towards the automation of business transactions and work flow.
- c. From service perspective, E-Commerce is a tool that meets the needs of companies, consumers, and management to cut service costs (service cost) while improving the quality of goods and increase the speed of service delivery.
- d. From the online perspective, E-Commerce provides the ability to buy and sell goods and information through Internet

E-Commerce activities cover many things, based on their characteristics E-Commerce can be divided into two:

- a. Business to Business, characteristics:
  - 1) Trading partners who already know each other and between them already established a good relationship.
  - 2) The exchange of data is done repeatedly and periodically which is the data format has been agreed.
  - 3) One of them do not have to wait for the rest of their colleagues to transmit the data.
  - 4) peer to peer model, where intelligence processing can be distributed in both businesses.
- b. Business to Consumer, features:
  - 1) Open to public, where information is distributed in general.
  - 2) A service that is used is also very general and can be used by many people.
  - 3) A service that is used by request.
  - 4) Frequent system client-server approach

Benefits of using E-Commerce in a company as a transaction system are:

- a. May increase market exposure (market share). Transactions on-line that makes everyone around the world can order and buy products that are sold only through computer media and is not limited to the distance and time.
- b. Lower operating costs. E-Commerce transaction is a transaction that most of the operations are programmed in the computer so the costs such as showroom, worker salary excessive, and others is not needed.
- c. Global reach. Online transactions that can be accessed by everyone in the world is not limited by space and time because everyone can access it in their computer or mobile.
- d. Increase customer loyalty. This is because E-Commerce transaction system provide complete information and that information can be accessed any time. Besides, in terms of purchasing can also be done any time.
- e. Improve supply management. E-Commerce Transaction is more efficient in operational costs companies, especially in the number of employees and the amount of stocks available. Further, to refine the cost efficiency then a good supply management system should be improved.
- f. Shorten production time. At a company that consists of various divisions or a distributor in which the ordering of raw materials or products to be sold when running out of goods, can order products any time and it will be faster because everything is automatically programmed in computer.

In order for a trade between buyers and sellers can be done, then there should be a specific process. E-Commerce transaction process can include the following stages (Suyanto, 2003) :

- a. Show. Sellers show the products or services on the site owned, complete with product detail, specifications and price.
- b. Register. Consumers do registration to enter the data identity, shipping address and login information.



- c. Order. Once consumers choose the desired product, consumers were subsequently conducted a purchase order.
- d. Payment. Consumers make payments.
- e. Verification. Consumer data verification to create payment data (No. account or credit card).
- f. Deliver. Products ordered will be delivered by the seller to the consumer.

#### 4. Hypothesis

1. There is significant relation between age and product variations
2. There is significant relation between age and easy payment
3. There is significant relation between job and product variations
4. There is significant relation between job and easy payment

#### 5. Research Methodology

The research object in this study is the consumers who purchase products in Tokopedia. Sample determined are 500 respondents. Data obtained by sending a questionnaire to the respondents via Tokopedia Message. From 500 questionnaires sent, 462 were returned, but the data which is suitable and can be further processed only 447 respondents. To describe the reasons and problems found when consumers buy products in Tokopedia, the researchers use descriptive statistical analysis, and for hypothesis testing is by using chi-square.

#### 6. Data Analysis and Findings

##### Demographics Profile of the Responden

Based on the survey of 447 respondents noted that 28% of respondents are male and 72% female. Based on age, 36% of respondents aged 21-25 years, 26% of respondents aged 26-35 years, 18% of respondents aged 16-20 years, 12% of respondents aged 36-45 years and 8% of respondents aged more than 45 years.

Table 1. Demographics Profile of the Respondents

Variables	Particular	Frequency	Percentage
Gender	Male	125	28
	Female	322	72
Age	16-20	80	18
	21-25	161	36
	26-35	116	26
	36-45	54	12
	>45	36	8
Job	Student	143	32
	Housewife	72	16
	Proffesional	232	52
Media	PC	18	4
	Laptop	85	19
	Mobile Phone	344	77

The survey results also showed that 52% of respondents are professionals, 32% of respondents students, and the remaining 16% of respondents are housewives. Judging from the media used, 77 % of respondents using mobile, 19% of laptops and only 4% were using a pc.



### Reasons why Indonesian people buy in Tokopedia.com

There are 4 reasons why consumers buy products in Tokopedia. They are: easy of payment, promo given, many choices of expedition, and variety of products. Description of reasons why consumers buy products in Tokopedia.com can be seen in the following table:

*Table 2. Description of Respondents Answer about The Reasons Purchase Products in Tokopedia According to Payment Options*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mobile Banking	286	64.0	64.0	64.0
	Internet Banking	99	22.1	22.1	86.1
	E-money	13	2.9	2.9	89.0
	Bank Transfer	49	11.0	11.0	100.0
	Total	447	100.0	100.0	

In the transaction, the data show that 64% of respondents use mobile banking, 22% use internet banking and only 3% using bank transfers.

*Table 3. Description of Respondents Answer about The Reasons Purchase Products in Tokopedia According to Promo Given*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cash back	340	76.1	76.1	76.1
	Point	107	23.9	23.9	100.0
	Total	447	100.0	100.0	

Kind of promo that attract respondents to buy products in Tokopedia is cashback and point system. The survey shows that 76% of respondents are interested because of the cashback they get, and 24% because of the points they get.

*Table 4. Description of Respondents Answer about The Reasons Purchase Products in Tokopedia According to Choices of Expedition*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	JNE	282	63.1	63.1	63.1
	TIKI	18	4.0	4.0	67.1
	Pos Indonesia	107	23.9	23.9	91.1
	Wahana	40	8.9	8.9	100.0
	Total	447	100.0	100.0	

The third reason why consumers buy products in Tokopedia is because there are many choice of expeditions. The survey shows 63% of respondents use JNE, 24% use Pos Indonesia, 9% use Wahana, and 4% use TIKI.

*Table 5. Description of Respondents Answer about The Reasons Purchase Products in Tokopedia According to Product Quality Choices*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Second	31	6.9	6.9	6.9
	Local Brand	174	38.9	38.9	45.9
	Import Brand	103	23.0	23.0	68.9
	Premiun Brand	139	31.1	31.1	100.0
	Total	447	100.0	100.0	

Fourth reason why consumers buy products in Tokopedia is because there are many product choices, from second product, local brand, imported to premium brand. The survey shows 39% of respondents choose local brand, 31% premium brand, 23% import brand and only 7% of respondents choose second product.



**Problem faced by consumers**

There are three problems perceived by consumers to buy products in Tokopedia, i.e.: (1) need internet connection, (2) the picture of the product does not same with the real product and (3) pay the fees expedition if we need to return the product. The survey shows in the following data:

Table 6. Problem Faced by Consumers Buy Products in Tokopedia.com

PROBLEM					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Need Internet Connection	72	16.1	16.1	16.1
	The picture of product doesn't same with the real product	232	51.9	51.9	68.0
	Pay the expedition fees if we need to return	143	32.0	32.0	100.0
	Total	447	100.0	100.0	

The survey results shown that 68% of respondents stated that the problems perceived in purchasing products in Tokopedia is because between the display image and the real product have differences, 32% of respondents said that we need to pay extra expedition fees if we need to return product, and 16.1% of respondents states that because it need internet connection.

**Relation between age and product variations**

Table 7. Age \* Product Choice Crosstabulation

			PRODUCT CHOICE				
			Second	Local Brand	Import Brand	Premium Brand	
AGE	16-20	Count	31	49	0	0	80
	Years	% within PRODUCT CHOICE	100.0%	28.2%	0.0%	0.0%	17.9%
	21-25	Count	0	125	36	0	161
	Years	% within PRODUCT CHOICE	0.0%	71.8%	35.0%	0.0%	36.0%
	26-35	Count	0	0	67	49	116
	Years	% within PRODUCT CHOICE	0.0%	0.0%	65.0%	35.3%	26.0%
	36-45	Count	0	0	0	54	54
	Years	% within PRODUCT CHOICE	0.0%	0.0%	0.0%	38.8%	12.1%
	>45	Count	0	0	0	36	36
	Years	% within PRODUCT CHOICE	0.0%	0.0%	0.0%	25.9%	8.1%
Total		Count	31	174	103	139	447
		% within PRODUCT CHOICE	100.0%	100.0%	100.0%	100.0%	100.0%

Table 8.-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	611.495 <sup>a</sup>	12	.000
Likelihood Ratio	684.946	12	.000
Linear-by-Linear Association	334.868	1	.000
N of Valid Cases	447		
a. 2 cells (10.0%) have expected count less than 5. The minimum expected count is 2.50.			



Table 9. Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Contingency Coefficient	.760	.000
N of Valid Cases		447	

Results of statistical tests shown that significant value is  $0.000 < 0.05$ , this means H1 accepted and H0 rejected. Thus it can be said that there is a significant correlation between age and type of products chosen.

#### Relation between age and easy payment

Table. 10 Age \* Easy Payment Crosstabulation

			EASY PAYMENT				Total
			Mobile Banking	Internet Banking	E-money	Transfer	
AGE	16-20	Count	80	0	0	0	80
	Years	% within EASY PAYMENT	28.0%	0.0%	0.0%	0.0%	17.9%
	21-25	Count	161	0	0	0	161
	Years	% within EASY PAYMENT	56.3%	0.0%	0.0%	0.0%	36.0%
	26-35	Count	45	70	1	0	116
	Years	% within EASY PAYMENT	15.7%	70.7%	7.7%	0.0%	26.0%
	36-45	Count	0	29	8	17	54
	Years	% within EASY PAYMENT	0.0%	29.3%	61.5%	34.7%	12.1%
	>45	Count	0	0	4	32	36
	Years	% within EASY PAYMENT	0.0%	0.0%	30.8%	65.3%	8.1%
Total		Count	286	99	13	49	447
		% within EASY PAYMENT	100.0%	100.0%	100.0%	100.0%	100.0%

Tabel 11. Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	582.633 <sup>a</sup>	12	.000
Likelihood Ratio	566.073	12	.000
Linear-by-Linear Association	314.535	1	.000
N of Valid Cases	447		

a. 6 cells (30.0%) have expected count less than 5. The minimum expected count is 1.05.

Table 12. Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Contingency Coefficient	.752	.000
N of Valid Cases		447	

Results of statistical tests shown that significant value is  $0.000 < 0.05$ , this means H1 accepted and H0 rejected. Thus it can be said that there is a significant correlation between age and the type of payment chosen.



**Relation between job and product variations***Table 13. Job \* Product Choise Crosstabulation*

			PRODUCT CHOICE				Total
			Second	Local Brand	Import Brand	Premium Brand	
JOB	Student	Count	31	112	0	0	143
		% within PRODUCT CHOICE	100.0%	64.4%	0.0%	0.0%	32.0%
	Hausewife	Count	0	43	29	0	72
		% within PRODUCT CHOICE	0.0%	24.7%	28.2%	0.0%	16.1%
	Proffesional	Count	0	19	74	139	232
		% within PRODUCT CHOICE	0.0%	10.9%	71.8%	100.0%	51.9%
Total		Count	31	174	103	139	447
		% within PRODUCT CHOICE	100.0%	100.0%	100.0%	100.0%	100.0%

*Table 14. Chi-Square Tests*

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	366.163 <sup>a</sup>	6	.000
Likelihood Ratio	467.683	6	.000
Linear-by-Linear Association	294.606	1	.000
N of Valid Cases	447		

a. 1 cells (8.3%) have expected count less than 5. The minimum expected count is 4.99.

*Table 15. Symmetric Measures*

		Value	Approximate Significance
Nominal by Nominal	Contingency Coefficient	.671	.000
N of Valid Cases		447	

Results of statistical tests shown that significant value is  $0.000 < 0.05$ , this means H1 accepted and Ho rejected. Thus it can be said that there is a significant relationship between the type of work with the type of products chosen.

**Relation between job and easy payment***Table 16. Job \* Easy Payment Crosstabulation*

			EASY PAYMENT				Total
			Mobile Banking	Internet Banking	E-money	Transfer	
JOB	Student	Count	143	0	0	0	143
		% within EASY PAYMENT	50.0%	0.0%	0.0%	0.0%	32.0%
	Housewife	Count	72	0	0	0	72
		% within EASY PAYMENT	25.2%	0.0%	0.0%	0.0%	16.1%
	Profession al	Count	71	99	13	49	232
		% within EASY PAYMENT	24.8%	100.0%	100.0%	100.0%	51.9%



Total	Count	286	99	13	49	447
	% within EASY PAYMENT	100.0%	100.0%	100.0%	100.0%	100.0%

Table 18. Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	233.194 <sup>a</sup>	6	.000
Likelihood Ratio	298.474	6	.000
Linear-by-Linear Association	138.902	1	.000
N of Valid Cases	447		
a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 2.09.			

Table 19. Symmetric Measures

	Value	Approximate Significance
Nominal by Nominal		
Contingency Coefficient	.586	.000
N of Valid Cases	447	

Results of statistical tests shown that significant value is  $0.000 < 0.05$ , this means  $H_1$  accepted and  $H_0$  rejected. Thus it can be said that there is a significant relationship between job with the type of payment chosen.

## 7. Conclusions

Based on the data analysis, the conclusions can be summarized as follows:

- There are 4 reasons consumers buy products in Tokopedia. i.e.: easy payment, promo given, a lot of expedition choices, and there are many products variety.
- There are three problems perceived by consumers to buy products at Tokopedia, they are: need internet connection, the picture of the product does not same with the real product and pay extra fees expedition if we need to return the product.
- There is a significant correlation between age and products variety. Age between 16-25 years tend to buy second products and local brand, age 26-35 years tend to buy local and imported brand, and age > 35 years tend to choose premium brand.
- There is a significant correlation between age with easy payment. Age between 16-25 years tend to use mobile banking, 26-35 years of age tend to use the internet banking, aged 36-45 years tend to use e-money, and age > 45 years tend to use bank transfer.
- There is a significant correlation between job and products variety. Students prefer to buy second product and local brand, housewives prefer to buy local brand, while professionals prefer to buy premium brand.
- There is a significant relationship between job and easy payment. Students and housewives prefer to use mobile banking, while professionals prefer to use internet banking.

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