Modelling impulsive factors for electronics and restaurant coupons’ e-store display

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Abstract. In many times, the increment of e-store visitors does not followed by sales increment. Most purchases through e-commerce are impulsive buying, however only small amount of study is available to understand impulsive factors of e-store display. This paper suggests a preliminary concept on understanding the impulsive factors in Electronics and Restaurant Coupons e-store display, which are two among few popular group products sold through e-commerce. By conducting literature study and survey, 31 attributes were identified as impulsive factors in electronics e-store display and 20 attributes were identified as impulsive factors for restaurant coupon e-store. The attributes were then grouped into comprehensive impulsive factors by factor analysis. Each group of impulsive attributes were generated into 3 factors. Accessibility Factors and Trust Factors appeared for each group products. The other factors are Internal Factors for electronics e-store and Marketing factors for restaurant coupons e-store. Structural Equation Model of the impulsive factors was developed for each type of e-store, which stated the covariance between Trust Factors and Accessibility Factors. Based on preliminary model, Internal Factor and Trust Factor are influencing impulsive buying in electronics store. Special factor for electronics e-store is Internal Factor, while for restaurant coupons e-store is Marketing Factor.

1. Introduction
Global retail and e-commerce retail condition had been improved significantly around Asia Pacific countries. In 2015, the growth had reached 28.4%, which can be considered as big number compared to North America (13%) and global (19.9%) [1]. The value of Asia Pacific e-commerce is predicted to be the greatest globally [2]. That numbers were triggered by the growth of credit card penetrations, wider product choices of global brands especially in China [3] and the increment of small business which are utilizing e-commerce transactions [4]. Among many popular products which are traded via e-commerce channels, Electronics and Restaurant Coupons are ranked in the tail of top 10 products [1]. Meanwhile, trends of e-commerce transactions are be persuaded by the consumer centric technology which means that user interface design of the store might be one of the most important factors to gain competitive advantages [3].

In traditional transactions, electronics and restaurant are usually to be bought after the product or service embedded in had been well-known by the consumer itself or recommended by other else. In electronics brick and mortal store, the consumer usually buys after they try the product to understand
the quality of products. In restaurant, consumer may buy the product based on other people recommendations, however the returning transaction would also happen after the consumer feel satisfy with the products or services they’ve experienced by them self. Both electronics and restaurant brick and mortal store allow the consumer to feel the senses (visual, odour, tactical, taste, and audio) of the products which are very opposite with ecommerce store. Each page of ecommerce store shall be the medium or point of sales under very limited virtual user experiences.

In the meantime, as well as in the brick and mortar store, impulsive buying behaviour in ecommerce store cannot be ignored. This activity is triggered by the pleasure or recreational activity during browsing the store [5]. From retailer’s perspective, the impulsive buying behaviour can be triggered by product layout and display [6]. Thus, user interface design of ecommerce store shall be a very carefully and strategically considered to improve ecommerce performances as point of sales [7].

Due to its value, potential, and research gap, it’s important to understand the impact of each display attributes and factors toward impulsive buying strategies. The strategy may be used for the retailer to improve the sales of their potential products as well as to the shopaholic to understand the basic causal of their behaviour. Previous study had revealed ecommerce impulsive buying behaviour in online fashion store [8], which may lack of generalization for other type of products or business process. Therefore, it is important to explore the similar research to electronics e-store and restaurant coupon’s e-store.

This paper presents exploration study to understand impact of web display attributes towards impulsive buying by 5 major chapters. Second chapter presents and discuss the generation of impulsive attributes and development of impulsive factors by factor analysis. Chapter three discuss the development of impulsive model by structural equation model. Reader may find the discussion of data processing as well as managerial implication. While in last chapter, reader may find conclusions and future potential research.

2. Impulsive Factors Development
The development of impulsive factors for each store is done through several steps, as detailed in Table 1. For both store, it began with the development of impulsive attributes and it finalized with factor analysis.

Impulsive attributes were developed by literature survey and also Critical Incident Techniques (CIT). Both methods were used to complement each other’s. CIT is also able to make sure the attributes fit with consumer’s point of view. Afterwards, each attributes found are then ensured their fitness to e-store web features. Potential attributes shall reflect the display web features that can be tested the impact to impulsive buying respond.

The process of attributes finding were done separately for each e-store type using two sample of pioneer of e-store in Indonesia. The samples are: Fave (formerly Groupon), Bhinneka.com. We elude the sampling from e-supermarkets such as Lazada, Alibaba, Amazon or MatahariMall to avoid bias that might happen during the application to e-store system.

Questionnaire was generated for each group of e-store based on the final attributes. Experienced respondents were filling up the questionnaire. Based on the questionnaire result, qualified potential attributes were grouped by factor analysis. Eigen value ≥ 1 is used to decide the number of factors to be developed. However, before factor analysis was conducted, a correlation test is performed to eliminate potential attributes that has low correlation coefficient (< 0.25) thus, final attributes are gained.
Table 1. Result of Impulsive Factor Development Process.

| No. | Process                                           | Electronics E-Store | Restaurant Coupons E-store |
|-----|---------------------------------------------------|---------------------|---------------------------|
|     | Parameter                                         |                     |                           |
|     | Identification Attributes from Literature Study   | Number of literature studied | 3                       | those are [5], [9], [10] | 4                       | those are [12], [13], [9] |
|     | Category of respondent                           | Number of attributes found | 11                      |                           | 8                       |                           |
|     |                                                   |                     |                           |
|     | Identification Attributes from CIT                |                     |                           |
| 2.  |                                                   | browse the electronics e-store at least once a week |                           | browse the restaurant coupons e-store at least once a week |
|     |                                                   | in previous time impulsively buying at least once |                           | in previous time impulsively buying at least once |
|     |                                                   |                     |                           |
|     | Number of sample                                  | 13                  | 16                       |
|     | Number of additional attributes found             | 4                   | 5                        |
| 3.  | Fitting attributes                                | 31                  | 20                       |
| 4.  | Questionnaires                                    | Respondent category |                           |
|     |                                                   | browse the electronics e-store at least once a week |                           | browse the restaurant coupons e-store at least once a week |
|     |                                                   | in previous time impulsively buying at least once |                           | in previous time impulsively buying at least once |
|     |                                                   |                     |                           |
|     | Number of qualified potential attributes          |                     |                           |
|     | Pearson correlation validity test                  | >0.25 (p-value = 0.05) | >0.35 (p-value = 0.05)   |
|     | Alpha-cronbach reliability test                   | 0.837               | 0.919                    |
|     | Number of sample                                  | 162                 | 140                      |
| 5.  | Correlation test                                  | 17                  | 14                       |
| 6.  | Factor Analysis                                   | KMO Test            | 0.893                    | 0.890                    |
|     |                                                   | Bartlett’s Test of Sphericity significance | 0.000                    | 0.000                    |
|     |                                                   | MSA Score            | >0.70                    | >0.70                    |
|     |                                                   | Number of factors developed | 3                       | 3                        |
|     |                                                   | Name of factors developed |                     |                           |
|     |                                                   | Accessibility Factor |                           | Buying Accessibility Factor |
|     |                                                   | Internal Factor      |                           | Marketing Factor          |
|     |                                                   | Trust Factor         |                           | Trust Factor              |

2.1. Electronics Factor Results

**Accessibility Factor** contains attributes that allows consumer to understand and access the products easily including products’ interesting characters and popularity. The accessibility attributes are: zoom feature (ZOOM), most selling products information (MSP), most viewed product information (MVP), newsletter page (LN), popular category menu (MKP), and advanced search features (LPS). **Internal Factor** assembles final attributes that contains basic feature of an e-store display profile. Those are: picture of products (TP), product specification information (PS), categorical menu (MENU), payment confirmation page (KP), tracking order page (LTO). **Trust Factor** includes all final attributes that convince the satisfaction after buying, i.e: inventory information (ISP), testimony (TESTIMONIAL), delivery lead time (LWP), product quality information (QP), e-store credibility (KREDWEB), and brand of products (MERK).
2.2. Restaurant Coupons Factor Results

As result of the factor analysis, 3 factors were generated, i.e.: Buying accessibility factor, Trust factor, and Marketing factor. Slightly different with Accessibility factors of electronics e-store, the Buying Accessibility Factor of restaurant coupons e-store defines all finals attributes which triggers or acting as catalysts of buying process, i.e.: instant voucher (IV), information of product expiry (VV), picture of product (TP), credit information (KK), payment method information (MP), delivery lead time (WP), and product variety (VV). In line with electronics e-store, Trust Factor corresponds with all final attributes which guarantee the satisfaction prior buying. Final attributes of this factor are: flexibility of redemption information (JLP), brand information (MERK), and expiry product information (KKP). Marketing Factor deals with all attributes that contains privilege of the product based on the marketing strategy, i.e.: percent discount information (PD), nominal discount information (ND), bundling information (B1G1), and gift information (GIFT).

3. Models Developments

Model of the research are referring to simplification of Stimulus – Organism – Respond model or SOR as used on [8] as seen in Figure 1. Because impulsive respond is spontaneous decision, organism is considered as black box [14], therefore it is assumed can be ignored. For each of e-store type, 3 scenarios were developed. Structural Equation Model (SEM) is able to recognise the interactions among attributes, between attributes and factor, factor and dependence variables. One of the SEM advantage is that this method can model multivariate variables (dependent or independent) [15]. Therefore, business practitioners can get a clear picture of their business by a SEM models.

![Modified SOR Framework](image)

Then, a scenario which has better model fit based on the SEM, is selected. The model fit parameters used are CFI, TLI, and RMSEA. CFI and TLI score should closer to 1, while RMSEA score should closer to 0. Detail result of each model for each e-store can be seen in Table 2, while detail of each scenario can be seen in sub section 3.1 and 3.2.

| Table 2. Model Fit Parameter. |
|--------------------------------|
|                          | Electronics E-store | Restaurant Coupons E-store |
|                          | CFI   | TLI   | RMSEA | CFI   | TLI   | RMSEA |
| Scenario 1               | 0.661 | 0.564 | 0.124 | 0.722 | 0.669 | 0.138 |
| Scenario 2               | 0.818 | 0.762 | 0.095 | 0.841 | 0.810 | 0.104 |
| Scenario 3               | 0.819 | 0.765 | 0.095 | 0.845 | 0.815 | 0.103 |

3.1. Electronics E-store Model

First scenario was generated with assumption that all stimulus factors are correlated to Impulsive Buying Willingness without any covariance amongst each factor. Second scenario was assuming that consumer buying will be influenced by Trust Factor and Internal Factor; meanwhile Accessibility Factor will influence directly Trust Factor. While third scenario was generated by assuming that the
Accessibility Factor will influence Impulsive Buying Willingness indirectly through Trust Factor. In other hand, the Trust Factor is influenced by Accessibility Factors.

Scenario 3 has best model fit and shall be selected, because it has lowest RMSEA score (0.095), highest TLI score (0.765) and CFI score (0.819). Figure 2 shows the path diagram for scenario 3. As shown in the path diagram, Internal Factor is major influencer for Impulsive Buying Willingness with factor loading 1.07. Meanwhile Accessibility Factors and Trust Factors are empowering Internal Factors by 0.605 and 0.458. For Internal Factor, three major influencer attributes are Tracking Order Page (1.162), Categorical Menu (1.132), and Picture of Product (1.00). Three major influencer attributes for Trust Factor are Brand (1.224), Product Quality Information (1.139) and Information of Delivery Lead Time (1.105). Meanwhile, three major influencer attributes for Accessibility Factors are Most Selling Product Information (0.79), Most Viewed Product Information (0.73) and Popular Category Menu (0.7).

![Figure 2. Path Diagram for Third Scenario Model for Electronics E-store.](image)

3.2. Restaurant Coupon E-store Model
Similar with restaurant coupon e-store model in this type of e-store, three scenarios were developed to be tested. First scenario was generated with assumption that all stimulus factors are correlated to Impulsive Buying Willingness without any covariance amongst each factor. Second scenario assumes that only Trust Factor and Marketing Factor influencing impulsive buying. This scenario considers that the Accessibility Factor will influence Impulsive Buying Willingness indirectly through Trust Factor. Third scenario is assuming that Marketing Factor and Accessibility Factor are influencing respond, while Trust Factor is influencing Accessibility.

Here, scenario 3 also has best model fit, with lowest RMSEA score (0.103), highest TLI score (0.815), and highest CFI score (0.818). Figure 3 shows the path diagram for scenario 3. In Figure 3, Accessibility is shown to be the major influencer for Impulsive Buying Willingness with factor loading 0.65, whilst Marketing’s factor loading is 0.09. Three major influencer attributes for Accessibility are Voucher Variety Information (1.275), Payment Method Information (1.22), and
Product Expiry Information (1.219). Three major influencer attributes for Marketing Factor are Gift Information (1.247), Number of Discount information (1.1) and Percent Discount (1.00). Meanwhile, three major influencer attributes for Trust Factors are Information of Flexibility Redemption (1.00).

**Figure 3.** Path Diagram for Third Scenario Model for Restaurant Coupons E-store

4. Discussion
As might be seen on previous chapter, it is clearly seen that Accessibility factor and Trust factor are generated for both e-store types as those factors are related with the buying process in general. Recognition of product is one of the most important aspects on point of sales that sure the identification of product and produce direct stimuli to consumers’ cognitive process. The easier a store creates appealing product identification, the easier a consumer is exposed with the buying stimuli.

It is also shown by the factor analysis; that there is different consumer behaviour for electronics e-store and restaurant coupons e-store. This difference is caused by the characteristics of satisfaction and experiences on using the products. Restaurant coupons e-store impulsive buying behaviour is triggered by the marketing factors while electronics e-store impulsive buying behaviour is influenced by the internal factors. Products of restaurant have shorter consuming time compared with the electronic products. Thus the expectation of satisfaction for electronics product is higher than restaurants’. To ensure the expectation of satisfaction span, consumers have willingness to sacrifice more for the product as long as the product itself guarantee to give the constant satisfaction throughout the consuming time. Therefore, in electronics e-store factors, internal factor is generated.

The third scenario of electronic store model was developed based on the actual buying characteristics of electronics product. In electronics product, it appears that during browsing activity,
the basic feature of e-commerce store will be effective if consumer can access and understand the characteristics of product and trust to the satisfaction that could be given by buying the product.

Meanwhile, in restaurant coupons, the marketing factor is generated rather than internal factor. Based on the questionnaire respond, most restaurant coupons buying, a consumer can be distinguished into two major types: loyal brick and mortar store consumer and newbie consumer. The loyal brick and mortar store consumers have familiar with and have a clear expectation on quality of restaurant. Thus, whenever they find that desired benefit can be obtained with lower sacrificial, the trigger of pleasure getting from buying impulsively is higher. Meanwhile, for newbie consumers who are very opposite to the loyal consumer, a lower sacrificial or promotion may give lower risk on exploring the restaurant quality.

The proposed model, in other hand, is shown that the benefit of lower sacrificial only matter in small amount. Food, however, are basic and general commodity which easily being substituted. Therefore the accessibility can also be important factor in leading the buying decision. Consumer trust may influence impulsive behaviour indirectly via accessibility. The higher the trust, the higher accessibility factor influences impulsive buying behaviour.

Based on the impulsive factors and attributes, an e-store manager can measure the performance of their website toward impulsive buying. By measuring the performance, manager may improve the e-store display performance toward impulsive buying. The magnitude of each attributes gives the idea of prioritizing the improvement attributes. Further research may investigate whether this suggestion is effective to be applied in business process.

5. Conclusion
In this paper, impulsive attributes of an electronics and restaurant coupon e-store are identified. 16 attributes tested in influencing impulsive buying behaviour in electronics e-store, while 14 attributes shown their influence toward impulsive buying in restaurant coupon e-store. Accessibility factor and Trust factor are identified for both electronics and restaurant coupons. In electronics e-store, Internal factor is developed distinctively. Unique factor for restaurant coupons e-store is Marketing factor. The model suggested for each factors are showing that accessibility and trust are important factors to lead impulsive buying behaviour. However, different impact appears due to characteristics of product. In electronics e-store, both factors become indirect influencer for impulsive buying behaviour through internal factor. But in restaurant coupons e-store, accessibility factor have direct impact, and trust factor is indirect influencer through accessibility. This research is limited to particular e-store; therefore it is suggested to investigate generalization application of this research upon of e-mail or other product categories. It is also suggested to test this model on measuring and improving the e-store display performances.

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