REVIEW ON "EXPECTANCY DISCONFIRMATION THEORY" (EDT) MODEL IN B2C E-COMMERCE

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Abstract— this study focuses on a review of "Expectancy Disconfirmation Theory" (EDT) as a famous theory in measuring customer's satisfaction. In today's competitive e-marketplace, e-businesses that determine an efficient strategic think behind their e-commerce activities involve designing a qualified website and presenting good quality of products and services will be more successful in attracting customer satisfaction. These points emphasize on the importance of attracting customer's satisfaction for the vita of e-businesses. That's why measuring customer's satisfaction by an empowerment tool that has ability to cover and make relationship among all concepts that are explained above is imperative. "Expectancy Disconfirmation Theory" (EDT) which is defined as an theory for measuring customer satisfaction from perceived quality of products or services is reviewed in this research for measuring customers satisfaction. Evolution of "EDT" shown this theory is able to measure quality of services and information which provided by B2C E-commerce from customer's point of view. Moreover, review on EDT measurement methods and their strengths and weaknesses in accuracy of the results shown that Additive Difference Model (ADM) and Direct Effects Model (DEM) worked well across both standards involve customer's expectation and desire. Between DEM and ADM methods, when managers need information about desires and expectations DEM appears to be a good choice but it does not provide a distinct measure of the disconfirmation of customer's expectation and desire. In versus ADM provide a distinct measure of the disconfirmation of customer's expectation and desire. That's why it is concerned by managerial issues.

Keywords – Customer Satisfaction; "Expectancy Disconfirmation Theory" (EDT)

1. INTRODUCTION

Nowadays, the online marketplace is rapidly growing and the businesses that tend to get benefit from e-marketplace are expanding. In such competitive e-marketplace, those have more consider for attracting customer's satisfaction from different aspects of electronic commerce (e-commerce), for instance, the quality of websites [1] and quality of offered products and services [2,3] on the websites, will possess more share in the e-marketplace. That's why organizations need to more considered on their customer satisfaction when they involve with e-commerce. E-commerce plays a transaction role of an electronic medium between two or multiple parties [4]. The kind of online transaction which an organization deals with its customers directly is known business to customer (B2C).

In order to measure customer satisfaction in e-commerce, EDT is introduced as an important theory which can measure customer satisfaction from perceived quality of products or services [5,6,7]. EDT has two famous variables that are named (expectation or desire) and (experience or perceived performance). These

variables are defined in two different time periods. (Expectation or desire) are related to the pre-purchase time period that a customer has intial expectaion or desire about a specific performance such as quality of products or services. (Experience or perceived performance) are related to the after-purchase time period that the customer gets the experience after perceiving a real performance such as quality of a specific productor service. The difference between initial expectation or desire and perceived experience or performance is known as disinformation of expectation or desire [5,7,8].

The result of this difference, means disconfirmation of expectation or desire can be positive or negative.When customer's perceived performance about the quality of specific product or service is better than customer's expectation or desire,the positive disconfirmation will ocure.At the same way, when customers perceives the performance worse than what they expected or desired about the quality of specific product or service,the negative disconfirmation will emerge.According to [9] positive disconfirmation will lead to customersatisfaction and negative disconfirmation means perceived performance of products or services couldn't attract customer satisfaction.

EDT has been applied by many researchers in different fields for better understanding of customer's expectations and requirements for attracting their satisfaction, such as marketing [5,10,11,12], tourism [13] , Psychology [14], information technology [8,15,16,17,18], repurchase behavior and retention [8,17,19,20] and airline industry [21,22].

For evaluating customer satisfaction from quality of website, product and services, EDT according to its natural competences can fulfill the responsibility of measuring customer satisfaction [5,7,19].

EDT has a psychological nature that can evaluate customer satisfaction from presented information on the first level [23] and can evaluate customer satisfaction from presented quality of products and services in the second and third level [5,6,7].

This study attempts to fulfill three objectives in this review involve:

- Review on the evolution of EDT model and identify its capabilities in measuring customer satisfaction.

- Review on different measurement methods of EDT.

- Choosing an appropriate measurement method in EDT from E-commerce management's point of view.

2. LITERATURE REVIEW

2.1 History of Cognitive Dissonance theory (CDT)

Expectancy Disconfirmation Theory (EDT) is conducted on the base of Cognitive Dissonance theory (CDT) that is introduced in 1957 by Leon Festinger; therefore a literature of CDT is reviewed in this section before review on the definition of EDT and its applications.

Leon Festinger in 1957, proposed Cognitive Dissonance theory (CDT) that defines a dissonance between cognition of something and its reality. Perceived dissonance causes to change a person's idea about a specific cognition [8]. This change has psychological reason, because feeling the dissonance between whatever a person has taught about qualification of something and what he/she realize from actual performance is unpleased and make discomfort in person's mind and this uncomfortable feel encourage the person to change her/his idea about cognition [24]. Festinger (1957) named this discomfort feel as dissonance.

A person for moderate the dissonance's unpleasant feel, try to decrease the dissonance which is occurred from the difference between two kinds of cognition as initial cognition of something and what is happened in real world. Psychologically, a person attempts to enhance the significance of consonant cognition and reduce the significance of dissonant cognitions in his/her mind, it means summation of consonant cognitions and subtraction of dissonant cognitions [24].

On the other hand, normally persons resistant in versus change. They are willing to change their attitude just when they have the least resistance to alter their idea. This kind of resistance is volunteer to change and can reduce dissonance feel of cognition [24]. Reducing dissonance of cognitions by responsible, encourage the persons to change their remaining idea about dissonance. For promoting a person's satisfaction feel about something or a performance, reducing the dissonance feel of cognition has significant importance [25].

In summary, CDT is a theory for matching the person's expectation of something or a performance with what he/she experience about this thing or this performance in real world. Dissonance between the expectation and experience cause an unpleasant feel that according to human's psychology, the persons demonstrate the least resistance for reducing dissonance feel and are willing to align their expectation and experience, if the difference or dissonance between their expectation and experience don't be fundamental [26].

2.2 Evolution of EDT

Expectancy Disconfirmation Theory (EDT) is built on the base of (CDT) definition. (EDT) can measure customer's satisfaction from difference between customer's expectation and experience in perceived products or services [5,7,19]. Figure 2.1 is shown the first model of EDT which is proposed by [11].
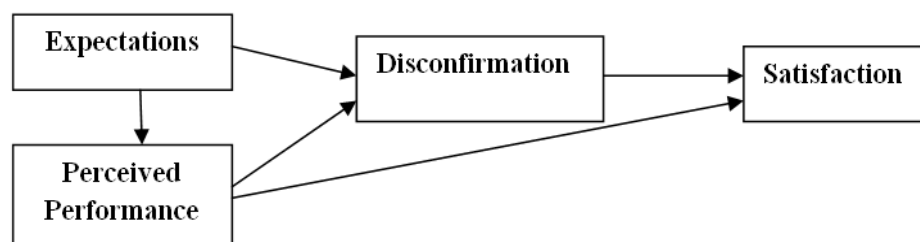

Figure 2.1: First EDT model [5]

This model is consists of four elements: expectations, perceived performance, Disconfirmation, and satisfaction as following description:

Expectations define customer's anticipates about performance of products and services [27]. EDT has ability to define multiple manners of customers in purchase process. First, the customers have an initial expectation according to their previous experience with using specific product or service. Expectation of this kind of customers which repurchase from a specific business is more near to reality. Second, the new customers that don't have a first-hand experience about performance of product or services and for the first time they purchase from a specific business. The initial expectation of this kind of customers is consist of feedbacks that they receive from other customers, advertising or mass media [28].

Perceived performance indicates customer's experience after using products or services that can be better or worse than customer's expectation [23]. Both kind of these customers who has first-hand experience or don't have first-hand experience will use purchased products or offered services for a while and can realize actual quality of presented products or services by the business.

Disconfirmation is defined as the difference between customer's initial expectation and observed actual performance [8]. According to literature, disconfirmation is divided to three types consist of positive disconfirmation, negative disconfirmation and simple disconfirmation.

When actual performance of specific product or services can't meet customer's expectation, negative disconfirmation will occur and leads to customer's dissatisfaction. Positive disconfirmation will lead to customer's satisfaction, if perceived performance of specific product or services are able to exceed customer's satisfaction. Finally, when there isn't any difference between customer's expectation and actual performance of specific product or services, means perceived performance is equal with expectation and simple confirmation is occurred [5,12]. There is some arguing in literature in definition of simple confirmation. While some researchers believe satisfaction is the result of simple confirmation [29], others suggest that state of neither satisfaction nor dissatisfaction lead to simple satisfaction [30].

[23] Proposed a model that shows information satisfaction is one of the customer's satisfaction items. This model is shown in Figure 2.2.
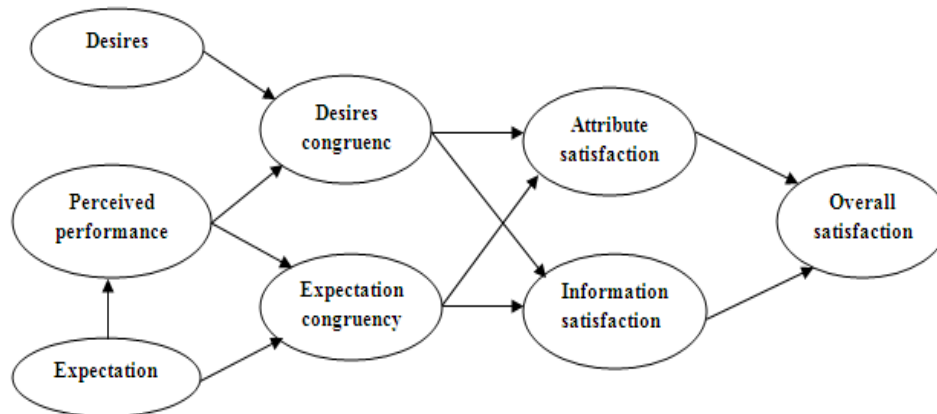
Figure 2.2: EDT model which present information satisfaction [23]

According to this model of EDT, satisfying customers is not limited to expectation of products or services. Rather than these factors, satisfying customer from perceived information is the first step that can attract customer's trust to offered products and services by business.

If they realize that perceived information of product or service satisfy their initial expectations, then occurred positive disconfirmation leads to their satisfaction. In versus, if the perceived information of products or services doesn't match with their initial satisfaction, then negative disconfirmation leads to their dissatisfaction.

[7] Divided customer's demands to two concepts consist of "expectations" and "desires". "Expectations" are defined as a set of standards that predict expectations and anticipates of customer about specific product or service [31,32,33].On the other hand, "desires "are defined as a set of attributes that present more value to the customers [23]. Figure 2.3 shows the impact of "Expectations" and "desires "on perceived performance in EDT model.
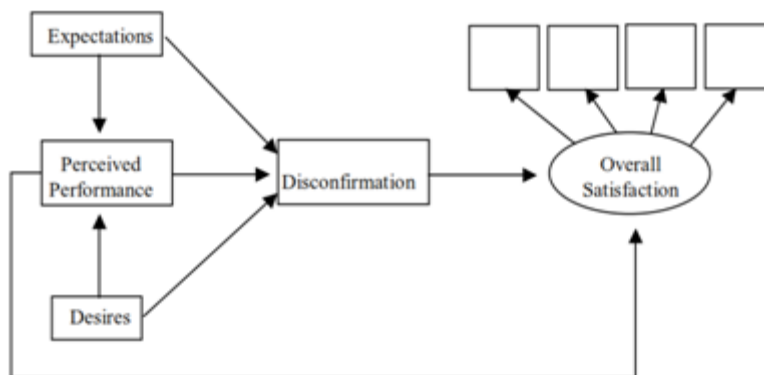
Figure 2.3: Desires and Expectation Disconfirmation model [7]

According to this model of EDT (Figure 2.3), expectations has a positive impact on perceived performance [7, 9] and desires produce a positive relationship with perceived performance, too [7]. Also, Disconfirmation generates a positive effect on overall satisfaction, that is consists of both negative and positive disconfirmation [9]. Despite of pervious researches that didn't find any relationship between perceived performance and overall satisfaction [5,23], current research has confirmed performance has direct impact on overall satisfaction [23,27,35].Overall e-satisfaction can define as customer's satisfaction of previous purchase experience from websites in different aspects such as customer's information satisfaction, online facilities satisfaction and purchase satisfaction.

In summary, EDThas two famous variables that are named (expectation or desire) and (experience or percieved performance). These variables are defined in two different time periods. (Expectation or desire) are related to the pre-purchase time period that a customer has intial expectaion or desire about a specific performance such as quality of products or services. (Experience or perceived performance) are related to the after-purchase time period that the customer gets experience after perceiving a real performance such as quality of specific product or service. The diferrence between (initial expectation or desire) and (percieved experience or performance) is known as disconfirmation of expectation or desire [5,7,8].

The result of this difference, means disconfirmation of expectation or desire can be positive or negative.When customer's perceived performance about the quality of specific product or service is better than customer's expectation or desire,the positive disconfirmation will ocure.At the same way, when customers perceives the performance worse than what they expected or desired about the quality of specific product or service,the negative disconfirmation will emerge.According to [9] positive disconfirmation will lead to customer satisfaction and negative disconfirmation means perceived performance of products or services couldn't attract customer satisfaction. These three teorical definitions involve expectations, negative or positive disconfirmation and customer's behaivour along satisfaction or dissatisfaction are explained transparently by a framework of [12] that divided these three kinds of definition to three part and explained the relationship among them.

[12] proposed a conceptual framework consist of three parts: part 1(expectations), part 2 (customer's satisfaction or dissatisfaction) and part3 (customer's behaviors).This framework is illustrated in Figure 2.4. It clearly shows meeting which kinds of expectation in part 1 lead to customer satisfaction in part 2 and in versus failure of meeting which kinds of expectations in part 1cause dissatisfaction feel in customers as part 2, also it indicates satisfaction or dissatisfaction feels as part 2 lead to which behaviors in customers as part 3.
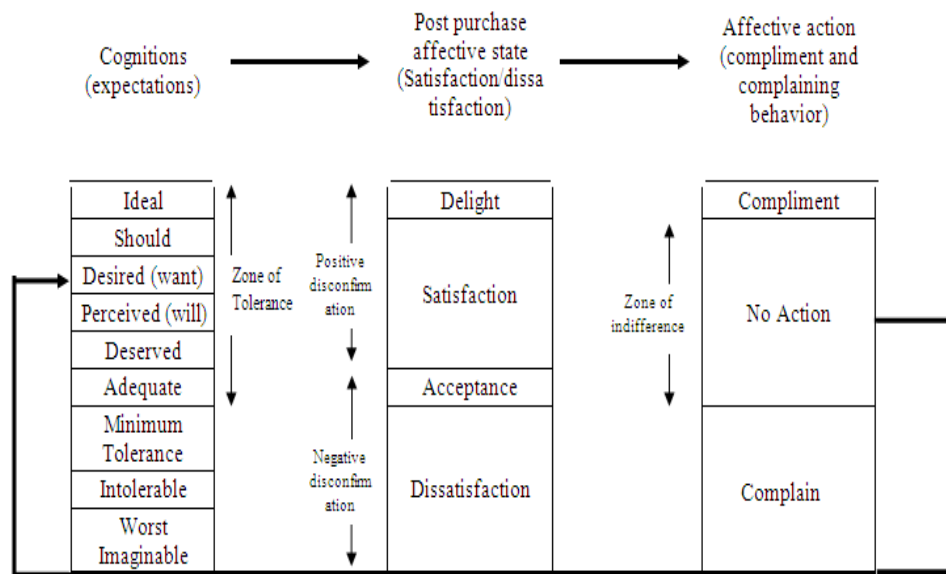
Figure 2.4 Conceptual framework of EDT [12]

First part of this framework indicates that customer's expectations have different levels consist of two zones: intolerable and tolerable areas. In intolerable zone, the smallest difference between customer's expectation and perceived performance will lead to dissatisfaction result as is shown in part 2, while in tolerable zone three state is predictable. First, when perceived performance is adequate and acceptable in comparison with customers expectation that leads to acceptance result of previous usage of product or services in part 2, but it yet has a negative disconfirmation because couldn't make a more satisfaction in customers. Second, when perceived performance is very near to whatever customer had desired or predicted that lead to satisfaction or delight feel. Disconfirmation of this difference will be positive because this performance could make more satisfaction in customers.

Third part explains customer behavior from perceived satisfaction or dissatisfaction. High satisfaction or even delight feel in customers from previous purchase will lead to compliment behavior and as it is predictable dissatisfaction feel will lead to complain behavior.

2.3   EDT measurement methods

[7] examined five methods for measuring disconfirmation of customer's expectation and desire and identified advantages and disadvantages of these methods. Tables 2.1 till 2.5 explain these methods with details.

Table 2.1: Difference score (DIFF) [7]

Method of Disconfirmation Measurement	Studies	Description Mathematical	Verbal Description
Difference score (DIFF)	[1,35,36,37,38,39,40, 41]	$\sum(P_i - S_i)$ where P_i is the performance on attribute i; S_i is the standard on attribute i.	Disconfirmation is the numerical difference between performance and a pre experience Standard.

Advantages: this method is efficient when measures of the standard and performance are needed.

Disadvantages: low reliability, assumes pre use expectations are the same as retrieved expectations.

Table 2.2: Direct effects Model (DEM) [7]

Method of Disconfirmation Measurement	Studies	Description Mathematical	Verbal Description
Direct effects Model (DEM)	[40,42,43]	$\sum P_i, \sum S_i$ where: P_i is the performance on attribute i; S_i is the standard on attribute i.	The standard and perceived performance are modeled as direct antecedents of satisfaction.

Advantages: Does not constrain the effects of the standard and performance to be equal, as do difference scores.

Disadvantages: Assumes pre use expectations are the same as retrieved expectations.

Table 2.3: Better than/worse than model (BTWT) [7]

Method of Disconfirmation Measurement	Studies	Description Mathematical	Verbal Description
(BTWT) Better than/ worse than	[5,27,32,35]	∑SDi where: SDi is the subjective judgment of the degree of difference between performance and the standard, and an evaluation of this difference.	Disconfirmation is a subjective assessment of whether the performance was better than or worse than a standard.

Advantages: Straightforward, direct measure.

Disadvantages: May produce are striction in range when used with desires; past research has found a lack of relationship with its purported antecedents

Table 2.4: Standard-percept disparity model (SPD) [7]

Method of Disconfirmation Measurement	Studies	Description Mathematical	Verbal Description
Standard-percept disparity (SPD)	[44]	∑SDi where: SDi is the subjective judgment of the degree of difference between performance and the standard.	Disconfirmation is a subjective assessment of how performance is different from the standard.

Advantages: Straightforward, direct measure.

Disadvantages: Does not account for performance that exceeds the standard; does not explicitly include an evaluation of difference.

Table 2.5: Additive Difference model (ADM) [7]

Method of Disconfirmation Measurement	Study	Description Mathematical	Verbal Description
Additive Difference model (ADM)	[7,45]	$\sum SD_i\, e_i$ where: SD_i is the subjective judgment of the degree of difference between performance and the standard. And (e_i) is the evaluation of this difference.	Disconfirmation is a subjective assessment of how performance is different from the standard. Multiplied by an evaluation of this difference.

Advantages: Close match to conceptual definition of disconfirmation; is a general form of other combinatorial methods.

Disadvantages: Requires two measures for each attribute.

3. METHODOLOGY

This study focuses on a review of EDT to fulfill three objectives of this study. EDT model evolution reviewed to identify capabilities of EDT in measuring customer satisfaction from multiple aspects. For this aim, this review started from first model of EDT by [11] and introduced the capabilities which added to the first model of EDT to measure customer satisfaction from different aspects such as satisfaction of products and services quality and information quality that provide by specific B2C E-commerce.

For introducing EDT measurement methods, a review on [7] conducted by this study for introducing 5 measurement methods of EDT and their strengths and weaknesses. At the end of this review with comparison among multiple measurement models, appropriate models that can measure customer satisfaction from all aspects will introduce in the conclusion of the review.

4. CONCLUSION

[7] examined Five methods which are introduced in the previous part for measuring disconfirmation of customer's expectation and desire. The results showed the only methods that worked well across both standards involve customer's expectation and desire were the Additive Difference Model (ADM) and Direct Effects Model (DEM). The usefulness of the ADM is primarily in theoretical research where researchers want to use a common method for measuring both desires disconfirmation and expectations disconfirmation.

Between DEM and ADM methods, when managers need information about desires and expectations DEM appears to be a good choice but it does not provide a distinct measure of the disconfirmation of customer's expectation and desire. That's why it is not suitable in most managerial issues because managers can't realize their operation in providing customer's satisfaction. In versus ADM provide a distinct measure of the disconfirmation of customer's expectation and desire. That's why it is concerned by managerial issues.

Because of the importance of Additive Difference Model (ADM) in measuring disconfirmation of customer's expectation and desire which make possible measuring customer's satisfaction, in the next section literature review is followed by studying ADM mathematically to identify how ADM measure customer satisfaction.

Author believes ADM model can use as an accurate method for measuring customer satisfaction from quality of services, products and information which present by websites of B2C e-businesses. Also, it can use for measuring customer satisfaction from actual performance of B2C e-businesses which deliver their products to the customers non-virtually. Delivery of right products in the right time with the right quality all are some aspects of customer satisfaction that can meet customer's expectation and can measure by ADM method accurately. There is not adequate consider on this method in the previous studies for measuring customer satisfaction from the applications that displayed above. This review can encourage researchers to use this method to examine in suggested applications for measuring customer satisfaction.

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