Measuring E-Browsing Behaviour and Testing its Impact on Online Immersion

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Abstract: In an online environment, enriched by different types of cues that may distract a consumer, investigating and operationalizing, e-browsing behaviour becomes a must to understand consumer behaviour online. Nevertheless, existing research on the online environment has only used and adapted scales measuring offline browsing. In fact, the existing literature fails to offer a scale measuring browsing specifically in the online context. Consequently, this study fills this gap by developing a scale measuring e-browsing following the Churchill paradigm enriched with the recommendations of Rossiter. For this purpose, a number of methodological instruments are used: two focus groups (the first with 4 experts and the second with 18 consumers) and three surveys (140 students for the first survey, 350 and 200 Internet users, respectively, for the second and third survey). Results put forth a unidimensional scale with 7 items, which seems to exhibit evidence of reliability and validity. The predictive validity was checked by testing the impact of e-browsing on online immersion. The proposed scale measure may help academicians perform better and more reliable studies on consumer behaviour online. It may help managers better understand the traffic on their websites and segment visitors to tailor better conversion strategies.

Keywords: Measurement scale development, e-browsing, online behaviour, merchant website consumer behaviour

Introduction

Increasing website traffic is a fundamental pillar for making online purchases (Laroutis, Boistel & Badot, 2021; Kim & Pant, 2019; Zheng *et al.*, 2019), especially given that merchant websites are not only a place where Internet users buy their products but also a place for social life, discovery, walks and relaxation (Kim & Pant, 2019). However, the percentage at a

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given moment of Internet users who are only browsing the website can be significant. Browsing is defined by Bloch & Richins (1983) as “a leisure activity in stores, carried out without intention to purchase, and whose motivations are mainly recreational”. In other words, Internet users can browse certain websites not because they have a particular purchase intention, but because they just want to "browse". Much research has drawn attention to the importance of the browsing behaviour, whether offline or online (Lombard & Labbé, 2015; Liu *et al.*, 2018 ; Ono *et al.*, 2012). For instance, Ho (2021) highlighted that consumers' latent shopping intent and related behaviours within a website depend on channels the consumers click through and, consequently, on the goal-directed and exploratory (browsing) modes.

Bloch, Ridgway & Sherrell (1989) have suggested that browsers could play the role of prescribers for other types of consumers, such as shoppers, and therefore generate sales. Other researchers (Bloch, Ridgway & Sherrell, 1989) mentioned that consumers engaging in a browsing activity would be likely to advertise stores in which they regularly browse, as well as products with which they came into contact during their visits to the sale points. Furthermore, Lombard & Blandine (2015) highlighted the importance of segmenting the consumers based on the intensity of their browsing behaviour and of adapting companies’ communication strategies in order to convert visitors into buyers or to retain them in store. In the same line of reflection, Lu *et al.* (2020) have recommended to differentiate between consumers who are genuinely interested in purchasing a product and those who are randomly visiting product pages. For the second, they discourage links to other product forums or product unrelated content.

Previous research has shown that the online environment presents many stimuli and recreational benefits that may increase search and revisit probabilities leading to an experiential behaviour and e-browsing (Lee, 2020). Understanding it becomes, therefore, of great importance to perform efficient communications campaigns by companies. However, despite its importance and the actual context of enriched websites, there is still limited research operationalizing this concept. Indeed, all scale measures found in the literature review are about browsing offline stores. It is even surprising that recent studies on the online environment are using old scale measures even though the latter present obvious weaknesses when applied in the online environment (Chen, Gupta & Pan, 2019; Zhang *et al.*, 2018). For instance, the first measure of browsing activity inside a store is a single-item measure (Bloch & Richins, 1983; Bloch, Ridgway & Sherrell, 1989). Respondents must answer a single question: "How often do you visit stores just to watch or to get information rather than to make a purchase?" This single-item measure of browsing activity is quite reductive and does not consider recreational motivations. Therefore, it does probably not

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fully capture the complexity of the browsing. The second measure of browsing activity was developed by Jarboe & Daniel (1987). This index of measurement poses problems of validity to the extent that several of its constituent elements do not make it possible to clearly differentiate the browsing. The third measure of browsing inside a store was developed by Bloch, Ridgway & Nelson (1991). Respondents must answer three questions to determine their propensity to browse. The values thus assigned are then aggregated to provide an indication of a consumer's propensity to browse. This measure of browsing activity is still fairly general and could pose problems of understanding. In the same framework of analysis, Lombart (2004) developed a scale to measure browsing in a store including 7 items, but none takes into account the specificities of the web. Yet, some recent studies have used the Lombart (2004) scale to measure e-browsing (Tekiki & Abbess, 2020).

Therefore, in the actual context of enriched websites and high familiarity with the web, there is an urgent need to develop a scale measurement of e-browsing. The proposed scale measure may help academicians perform better and more reliable studies on consumer behaviour online. At a managerial level, it may help managers better understand the traffic on their websites and segment visitors to tailor better conversion strategies.

This paper is structured as follows. The concept of browsing is firstly presented, and the main browsing measures noted in the literature are exposed. Second, a presentation of the context of enriched merchant websites may help understand the necessity to develop a scale specific to the online context. Third, the methodology and results detail the different steps of Churchill's paradigm (1979) and the recommendations of Rossiter (2002) applied to develop the scale measure of e-browsing. Finally, the proposed scale measure is discussed before concluding with the contributions, limitations and future agenda.

Back to the Browsing Concept

Browsing can be thought of as "the examination of products in stores, for recreational or informational purposes, without intention to purchase" (Bloch and Richins, 1983). According to this definition, consumers may be interested in the products or services offered, the ambience of the store, its presentation, and other consumers present in the store, with no intention to purchase (Lombart, 2004; Veg-Sala & Geerts, 2021). The browsing activity, conceptualized as a form of recreational experience, is carried out primarily for itself and not for the possibility of purchase that it offers. Thus, the concept of browsing is different from other adjacent concepts such as shopping, and window shopping. Shopping is "going from store to store to buy". This definition clearly emphasizes that the term “shopping” refers to the purchase of products or services (Jallais, Orsoni & Fady, 1994). So, the intention to buy distinguishes shopping (carried out with intention to buy) from browsing (carried out

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without intention to buy) (Shields, 1992). Ultimately, window shopping is a stimulus-seeking behaviour that can be accomplished with or without an intention to purchase (Jallais, Orsoni & Fady, 1994). This window-shopping activity is mainly conducted by consumers outside the stores (Jallais, Orsoni & Fady, 1994); conversely to browsing, which is a behaviour adopted inside stores. Many authors have considered the behaviour of browsing and have proposed a measure scale for it. Table 1 exposes some of the measurements and presents their limitations when applied online (Table 1).

Table1. Measurement scale of browsing

Authors	Objective	Scale measuring browsing	Limitations
Bloch & Richins, (1983); Bloch, Ridgway & Sherrell, (1989)	Measure the activity of browsing inside a store	-A single question. -By means of a 5-point scale ranging from "never" to “very often”	It does not consider recreational motivations. Therefore, it probably does not fully capture the complexity of the construct that is browsing.
Jarboe & McDaniel (1987)	Measure the activity of browsing inside a store	First, the respondents must answer dichotomously to the question: "Are you a browser (browser)?" Secondly, they must complete an index composed of 5 items. Respondents have the choice between the modalities of the following responses: “never; sometimes; always".	This index for measuring browsing activity poses validity issues, as several of its constituent elements do not allow to differentiate clearly browsing shopping.
Bloch, Ridgway & Nelson (1991)	Measure the activity of browsing inside a store	The respondents must answer three open-ended questions in order to determine their propensity to forage	This measurement of browsing activity is general and poses problems of understanding.
Lombart (2004)	Measure the activity of browsing inside a store	Churchill paradigm	This scale does not take into account the specificities of the web.

Browsing in the Online Context

Since the work of Donna and Novak (1997), several researchers (Novak, Hoffman & Yung, 2000; Donna & Novak, 1997 ; Hausman & Siekpe, 2009; Hsu, Chang & Chen, 2012) have studied online consumer behaviour, in particular their experience of shopping and browsing. Thus, the development of technologies allows the user to perform a task virtually while having the impression of performing it in the real world (Arnaldi, Guitton & Moreau, 2018). The advent of merchant sites on the Internet has radically changed consumer behaviour. It does not necessarily seek to accomplish a task within a commercial website. The consumer prefers to live an experience full of different emotions. In the same way, the contemporary

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consumer prefers to live consumption experiences rather than to buy simple products or services (Carù & Cova, 2006).

For, Zhang *et al.* (2018), browsing positively affects consumers' urge to buy impulsively and finally affects their impulse buying behaviour. They used the measurement scale of Floh & Madlberger (2013) of e-browsing, with two items about the percentage of time spent just looking around on the online group shopping website, and the intent to just look around on the online group shopping website. This scale does not describe the real behaviour of browsing. Similarly, Rezaei *et al.* (2016) have found that browsing may enhance online impulse buying. Chen, Gupta & Pan (2019) have shown that e-browsing enhances customers' urge to buy impulsively and continuance intention. Both studies used Park *et al.* (2012) scale measure, which was adapted from the twelve items of Babin, Darden & Griffin (1994). Ono *et al.* (2012) have examined the effects of consumer motivations on browsing online stores with mobile devices and compared them with those on browsing physical stores. Results showed that adventure motivation are important for mobile-based online stores, whereas gratification motivation is important for physical stores.

Researchers like Xu-Priour, Truong & Klink (2014) studied the effect of online social interaction on the e-browsing experience between two different cultures (Chinese and French). Thus, they stipulated that e-browsing experience and trust perception are positively related to behavioural intention to use. It is worth noting that the authors have used the Bloch & Richins (1983) scale in their research. Kaufman & Lindquist (2002) have defined an e-browser as: "someone who browses retail Websites but makes no purchase". They have added that persons who report online browsing without online purchasing will indicate a higher preference for in-store purchase than those who browse and purchase online. Law & Hsu (2006) have examined two groups of users (online browsers and online purchasers) of international hotel websites on their perceived importance level of specific dimensions and attributes on hotel websites. They stipulated that e-browsers are Internet users who had visited any hotel website in the past 12 months and did not make any purchase. Park *et al.* (2012) have examined the relationship among product attributes, web browsing, and impulse buying for apparel products in the Internet context. They used twelve items adapted from the literature measure of web browsing of Babin, Darden & Griffin (1994) and Lee & Lee (2003).

Other researchers have proposed typologies of e-consumers based on the purpose of their presence online and have identified consequently e-browsers. For instance, Econsultancy (2005) distinguished between trackers, hunters and explorers. The latter do not have any particular type of product in mind. They may have well defined shopping objectives (e.g., a

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present for a significant other) or even not at all. Cova & Cova (2004) distinguished two navigation behaviours, one directed towards a goal and the other exploratory. Indeed, according to them, the consumer experience is not limited to pre-purchase activities (awakening of needs, search for information, etc.), nor to post-purchase activities (evaluation and satisfaction), but encompasses a series of other activities (pleasure, curiosity) to influence the consumer's future decisions and actions. In the same framework of analysis, Novak, Hoffman & Yung (2000) showed that exploratory behaviour is related to an experience (search by simple curiosity). In the same way, Wolfinbarger & Gilly (2001) segment Internet users according to the purpose of their navigation and to the importance of the hedonic dimension of users' surfing. They distinguished goal-directed behaviour from experiential behaviour. The first is a structured behaviour to achieve specific goals, which are established beforehand. The user navigation is structured and linear because it is directed towards a specific goal. It is characterized by commercial or functional benefits corresponding to the objectives of the visit to the website, such as collecting information on the brand or its products, getting samples, discounts or buying online. The second, which is the experiential behaviour, is "unstructured" and corresponds more to lingering on a site, an activity that can possibly be achieved by a purchase which was not initially decided: e-browsing the website of a luxury brand for aesthetic pleasure of immerging in its world, to dream, to discover the new collections, events and history. It is characterized by hedonic or experiential benefits. They concern hedonic, aesthetic and symbolic aspects of the visitor experience. They correspond to the subjective responses of the user to different sensory stimuli and include emotional reactions. Wolfinbarger & Gilly (2001) highlight that these types of behaviours influence the assessment of the offer and are strongly influenced by situational and individual variables. That is, in the case of a goal-directed behaviour, the consumer will assess the commercial offer by comparing all the offers available. Therefore, variable prices on the Internet can be a determining factor in the purchase of some product categories due to the transparency and the visibility offered by this channel. For experiential behaviour, the goals of the user are progressively set while navigating (Donna & Novak, 1997). In this case, the attention and the perception of the user are oriented towards sensations, emotional reactions and mental evocations. Atmospheric factors may influence the visitor experience. This mode of behaviour induces an overall assessment.

Research Method

To develop the measurement scale of e-browsing, the Churchill paradigm (1979) enriched with Rossiter (2002) is applied in this research through the five steps detailed in Table 2.

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Table 2. Application of Churchill's paradigm (1979)

Steps	Studies
1st step: Specify the domain of the construct	• Definition of the concept of online browsing • Qualitative study: 18 consumers questioned about their browsing behaviour (semi-structured individual interviews)
2nd step: Generate a sample of statements	• Drafting of 11 items • Submission to 4 experts • This leads to the deletion of two items
3rd step: First data collection	• Data collection: 140 consumers asked about their browsing behaviour • Selection of a 5-point Likert format • Exploratory factor analysis (analysis principal component factorial). • This leads to the deletion of two items
4th step: second data collection	• Data collection: 350 consumers asked about their browsing behaviour • Selection of a 5-point Likert format • Exploratory factor analysis (analysis principal component factorial). • The number of items kept is 7
5th step: Purification phase	• Confirmatory factor analysis: PLS 3 • Evaluation of convergent and discriminating validity based on responses from 350 consumers • Testing predictive validity: the effect of online immersion on e-browsing (200 consumers)

Specifying the domain of the construct and generating statements: Based on the literature review, the definition of Bloch & Richins (1983) is retained. However, to adapt it to the context of websites, we adapt it as follows: “the examination of the offer online, for recreational or informational purposes, without intention to purchase"**.** To better understand the concept of e-browsing, a qualitative study was conducted. It was also used to generate items for the measurement scale. Eighteen in-depth interviews were carried out (nine men and nine women, between 25 and 44 years old; belonging to various socio-professional categories, having various levels of qualification and coming from different sectors of activities).

Interviewees were first asked to browse the matterport.com website: https://matterport.com/3d-marketing-for-real-estate/. Second, they were asked to describe their experience with the website in terms of what they liked and disliked and to think about their intention to buy and to revisit it. Lastly, interviewees were asked to share their motives to revisit the website again. Findings from the interviews confirm the relevance of the e-browsing behaviour. Indeed, some interviewees intend to revisit the website as a form of leisure to enjoy the site design, virtual reality. For instance: "*I have really liked the conception of this website, the visit ... the design ... I will come back to visit the site for an extraordinary experience*".

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Table3. Profile of Respondents

Individual	Gender	Age	Socio-Professional Category	Length of interview
1	M	32	Mechanical engineer	30 minutes
2	M	43	Lawyer	25 minutes
3	W	25	Student	40 minutes
4	M	35	Chief Service	25 minutes
5	W	26	Student	30 minutes
6	W	28	PhD student	20 minutes
7	W	30	Unemployed	30 minutes
8	M	40	Dentist	37 minutes
9	W	43	Trader	35 minutes
10	W	40	Paediatrician	25 minutes
11	W	27	PhD student	40 minutes
12	M	37	Accountant	30 minutes
13	M	30	IT engineer	35 minutes
14	M	36	Teacher	25 minutes
15	W	26	PhD student	35 minutes
16	M	39	Teacher	30 minutes
17	W	44	Commercial Director	35 minutes
18	M	38	Production manager	40 minutes

Following the recommendations of Rossiter (2002), several items were formulated. Afterwards, a qualitative pretest was conducted by submitting the statements to four experts. The experts gave their opinion on the clarity of the proposals. Two proposals were deleted as they were deemed too redundant or not applicable to our construct. Some proposals have also been reformulated. Finally, nine items were retained. At this step, we can thus propose a definition of online browsing: "*an online experience lived by the consumer, full of different emotions, following an experiential consumption of products in a virtual store, without intention to purchase*".

***Exploratory analysis*:** In order to pretest the items, data was collected from 140 Internet users. To ensure the reliability of the data collection, a website, likely to foster e-browsing was chosen (https://www.darellamma.com/darellamma). Under laboratory conditions, Tunisian business students were invited to visit the website, which offers guesthouse stays, for 15 minutes. Upon completion, participants were given a questionnaire composed of the items generated previously and asked to rate the items on a 5-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Totally agree"). Principal component analysis was undertaken. The various statistical analyzes carried out revealed a single dimension made up of the items. This factor explains 60.736% of the total variance. Cronbach's alpha (standardized) is 0.878. All the items except two have a satisfactory quality of representation or commonality, that is to say, greater than 0.50. (See Table 4.) However, the last two items of the qualitative study have been deleted. Therefore, seven items are retained.

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Table 4. Factor analysis and reliability test results

Item	Quality of representation	Factor loading
- Strolling through some merchant websites is a real pleasure for me.	0.702	0.865
-Sometimes I wander through online shopping websites the way other people go to a movie or a soccer game, just to relax.	0.690	0.830
-It happens very often that I browse certain merchant websites, purely for pleasure, without intending to buy anything.	0.688	0.825
-It is part of my leisure time to spend time in certain merchant websites to stroll around, without buying anything there.	0.650	0.802
-I consider that browsing a merchant website, without any purchase purpose, just to spend a moment there, is a waste of time.	0.616	0.764
-I consider that strolling in certain sites, without buying anything there, is a real hobby.	0.590	0.760
-It happens very often that I browse certain websites first for fun and then, possibly, to inform myself.	0.560	0.680
-I really liked the concept of this site, I will come back to visit the site for the pleasure.	0.411	0.404
-I'm just discovering the site.	0.402	0.401
Eigenvalue % of variance explained Cronbach's alpha (standardized) Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	5.668 60.736 0.878 0.802	

***Test and confirmatory analysis of the scale*:** The previous purification was carried out on students under laboratory conditions. In this phase, the objective is to verify the psychometric quality of the scale on a heterogeneous population of Internet users and in conditions outside the laboratory. In line with previous research on consumer online behaviour (Barbot & Kaufman, 2020; Charfi & Volle, 2011), participants were invited to browse the website for 10 minutes and answer a questionnaire made up of 7 post-purification items. A pool of 360 questionnaires was collected. However, some of them were eliminated because participants were familiar with the website (a filter question was included for this purpose). Thus, 350 questionnaires were retained; 52% of the respondents were women and 48% men. A majority of these respondents have a university diploma and they belong to different socio-economic categories. It should be noted that the results obtained during this second phase corroborate those obtained during phase 1 in two major aspects.

Carrying out the Principal Component Analysis (PCA) requires checking the factorization conditions of the browsing measurement scale. All values are above the critical threshold of 0.5. A PCA was performed on the seven items of the measurement scale. The Kaiser Mayer

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Olkin criterion was equal to 0.812 and leads to retention of a single factor explaining 74.78% of the variance. All factor contributions varied between 0.512 and 0.840. Consequently, all the items of this measurement scale have been kept. Cronbach's alpha was equal to 0.886 demonstrating a good reliability of the scale. The results are presented in Table 5.

Table 5. Purification test of the online browsing variable

Item	Quality of representation	Factor loading
1-It happens very often that I browse certain merchant websites, purely for pleasure, without intending to buy anything.	0.840	0.916
2-Strolling through some merchant websites is a real pleasure for me.	0.822	0.910
3- I consider that browsing a merchant website, without any purchase purpose, just to spend a moment there, is a waste of time.	0.818	0.904
4- Sometimes I wander through online shopping websites the way other people go to a movie or a soccer game, just to relax.	0.688	0.824
5- It is part of my leisure to spend time in certain merchant websites to surf around, without buying anything.	0.650	0.802
6- I consider that strolling in certain websites, without buying anything there, is a real hobby	0.590	0.680
7- It happens very often that I browse certain websites first for fun and then, possibly, to inform myself.	0.512	0.616
Eigenvalue % of variance explained Cronbach's alpha (standardized) KMO	5.996 74.789% 0.886 0.812	

A confirmatory factor analysis (CFA) was then conducted using Smart PLS3 on the entire sample (350 respondents) to check the convergent, discriminant and predictive validity. The composite reliability index obtained was 0.949 and the AVE (shared mean variance) was 0.860, which exceeds the required threshold of 0.7 (Chin, Peterson & Brown, 2008). Consequently, convergent validity is ensured. The discriminant validity is assessed by examining the factorial contributions (loadings) of the items to the construct. We checked, in particular, if, for each construct, the factor contributions are greater than the cross-factor contributions between each item and the other constructs. With reference to the literature, browsing has been shown by several researchers (Lombart & Labbé, 2008; Monglo, 2016) to be a response to a determining factor in Internet user reactions, such as online immersion. To do this, online immersion was measured using the scale of Fornerino, Helme-Guizon & Gotteland (2008). This scale was shown to use excellent psychometric qualities. Two hundred Internet users were selected (part of the 350 consumers questioned during the second data collection). The results show that the online immersion of Internet users has a positive influence on e-browsing ($t > 1.96$; $p < 0.05$. Consequently, the predictive validity is

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ensured. Furthermore, the square root of the AVE for each construct exceeds the inter-construct correlations concerning it. Therefore, the discriminant validity is also assured according to Fornell & Larker (1981).

Table6. Convergent validity criteria

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Browsing online	0.919	0.902	0.949	0.860

Table 7. Result of the research model

Correlation relationship	Correlation coefficients (standardized)	T-statistic	P value
Online immersion -> Browsing online	0.384	4.108	0.000

Table 8. Predictive validity

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (|O/STDEV|)	P Value
Online immersion -> Browsing online	0.384	0.382	0.093	4.108	0.000

	R Squared	R Squared Adjusted
Browsing online	0.732	0.721

Conclusions

Previous research has largely studied the behaviour of Internet users (Goel, Hofman & Sirer, 2012; Brown, Pope & Voges, 2003; Kumar *et al.*, 2010). Nevertheless, a measurement scale of online browsing taking into account the specificities of the web was missing.

This research fills in this gap by developing a scale measuring e-browsing behaviour. Results put forth a scale comprising a single factor materialized by 7 statements. The reliability and validity of the scale are satisfactory. In accordance with previous research, this scale is also unidimensional. Furthermore, to test the predictive validity, this research demonstrates that e-browsing influences immersion. This result is in line with Mackenzie (2013), who showed that browsers may have a greater preference for more hedonic site features that facilitate online exploration.

From a managerial point of view, it could be crucial for a manager of a merchant website to have consumers engaging in e-browsing activity, insofar as these surfers would be likely to

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advertise the website as well as the products with which they came into contact during their visit for free.

However, we believe that the limits of our study may open up new avenues of research. The most important to highlight is related to administering the scale to other samples and other classes of commercial websites to ensure its psychometric quality. Indeed, our empirical tests are carried out exclusively on a sample of Tunisian Internet users, who are not necessarily representative of global Internet users. Still, the chosen Internet users were only surveyed on two commercial websites, which may not definitely endorse the quality of the scale developed. Finally, developing a valid and reliable measurement scale is a long and continuous process. Accordingly, we recommend the use of this measurement scale for future browsing-based online research to further test its validity. Further research is needed to overcome these limits.

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