



Article

# Understanding the Effects of Social Media Marketing on Customers' Bank Loyalty: A SEM Approach

Mokhtar Elareshi <sup>1</sup>, Mohammed Habes <sup>2</sup>,\* D, Amjad Safori <sup>3</sup> D, Razaz Waheeb Attar <sup>4</sup>, Muhammad Noor Al adwan <sup>5</sup> and Waleed Mugahed Al-Rahmi <sup>6</sup> D

- Public Relations Department, Communication College, University of Sharjah, Sharjah P.O. Box 27272, United Arab Emirates
- <sup>2</sup> Radio & TV Department, Yarmouk University, Irbid 21163, Jordan
- <sup>3</sup> Faculty of Media, Zarqa University, P.O. Box 132222, Zarqa 13110, Jordan
- Department of Business Administration, College of Business and Administration, Princess Nourah bint Abdulrahman University, P.O. Box 84428, Riyadh 11671, Saudi Arabia
- Ollege of Mass Communication and Media, Al Ain University, Abu Dhabi P.O. Box 112612, United Arab Emirates
- <sup>6</sup> Self-Development Skills Department, College of Common First Year, King Saud University, Riyadh 11451, Saudi Arabia
- \* Correspondence: mohammad.habes@yu.edu.jo

**Abstract:** This study used customers' experiences to assess the role of social media marketing (SMM) efforts in increasing online customer-based loyalty in the banking sector in Jordan, and using the two main components of the TAM model, perceived the ease of use and perceived usefulness, to understand the relationship. Data were gathered through an online survey with 329 respondents through online banking services in Jordan. A test of the structural equation model (SEM) indicated that perceived usefulness strongly affects electronic word of mouth (EWM), informativeness (INF), and social media features (SMF); and perceived ease of use is indirectly linked to these factors. Behavioral intention is strongly affected by both the perceived usefulness and the ease of use of online banking services. Based on the self-proposed model, e-marketing has impacted customers' bank loyalty regarding its online services, and the role of social media marketing has remained very important to enhancing customer-based loyalty. This study contributes to the literature by integrating SMF, EWM, and INF in a single framework. It also provides managerial implications and guides for scholars, managers, and practitioners in e-marketing to use customers' experience to increase customer loyalty. Further research and suggestions are offered.

Keywords: e-marketing; social media marketing; customer loyalty; banking; customers; digital banking



Citation: Elareshi, M.; Habes, M.; Safori, A.; Attar, R.W.; Noor Al adwan, M.; Al-Rahmi, W.M. Understanding the Effects of Social Media Marketing on Customers' Bank Loyalty: A SEM Approach. Electronics 2023, 12, 1822. https:// doi.org/10.3390/electronics12081822

Academic Editors: Claudiu George Bocean, Adriana Grigorescu and Anca Antoaneta Vărzaru

Received: 22 January 2023 Revised: 13 March 2023 Accepted: 14 March 2023 Published: 12 April 2023



Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

# 1. Introduction

Social media sites, weblogs, discussion forums, and review websites are popular online environments where users can share and exchange their views and experiences with others, including organizations [1–4], and interact quickly with other users, regardless of their locations [5]. In marketing, the way in which the Internet, information, and communication technology (ICT) have been used by different profit and non-profit businesses has reminded us of their great contributions to marketing, through communication, interaction, etc., and also, of even greater significance, how social media sites can be used not only to promote a company's products and services, but also to increase customer loyalty [6]. Banks typically use a variety of social media platforms to communicate/respond to their customers' demands and queries [1,7]. In fact, social media sites and their interactive nature have led many banks to achieve a high level of marketing through what is known as social media marketing (SMM) [6,8]. SMM is a form of Internet marketing that uses social media applications, such as Facebook, Instagram, and TikTok, for brand promotion,

audience targeting, website traffic, etc., and enables brands to connect easily with their audiences [9]. In fact, it is arguably very difficult now for banks to operate/survive without adopting and integrating SMM [10,11], as this process is now part of every business [12]. Most bank services use mobile applications and social media for communication, and such accessibility and interaction can affect customers' behavioral intentions regarding the use of online communication and information for further benefits (linked to loyalty). This has led us to gain further insights into such phenomena, and there are emerging questions as to what impact SMM has on organizations (e.g., banks), how this is perceived by customers, and how it can lead to customers' loyalty [13]. Such interaction affects the long-term relationship between banks and their customers. Online customers use social media for more than mere information. They also interact with, evaluate, and contribute to the online environment at the same time [6]. SMM can provide several opportunities and improve bank services in terms of ease of use and accessibility at affordable rates.

While such relationships are important, research has suggested that there are gaps in the understanding of the relationship between SMM and customers' loyalty, e.g., in banks [12]. According to Priansa and Suryawardani [14], social media has become a major revenue-generating platform for marketers and advertisers, although the relationship can be affected by the lack of trust and reliability between the two parties. Due to this quick and effective communication, online users mostly possess their own opinions (positive/negative) about any brand or company [15]. The popularity of social media in Jordan, as in many countries, allows firms to deliver compelling services and content for users in a smart way. Currently, Jordan has more than six million active Internet users and 6.30 million social media users, but this number increased by only 11% between 2020 and 2021 [16]. The major social media platforms are Facebook (5+ million users), FB Messenger (3+ million users), and Snapchat and Instagram (both with almost 2.80 million users). These figures indicate a huge opportunity for potential e-commerce in Jordan. The market must search out customers' needs and desires through consistent and reliable strategies to gain their loyalty [17,18].

There is evidence of the importance of SMM and its role in online marketing aimed toward achieving customer loyalty [3,19]. However, the study of customers' loyalty in Jordan is still in its infancy. This study argues that customer loyalty and its contribution to banks are not fully understood. It aimed to explore the behavioral intention in using social media in terms of customer loyalty in Jordan, and those factors that influence such a relationship in the era of social media and digital technologies, using the technology acceptance model (TAM) to identify users' behavioral intentions. The purpose of this study, therefore, was twofold: (1) to expand the current literature by conceptualizing and setting out the key factors associated with customer loyalty and (2) to provide and discuss the theoretical background, integrating the theories previously mentioned in relation to customer loyalty. Practically, this study provides insights into banks' managers and marketers in terms of how they think about their futuristic approach toward customers' loyalty in the era of social media and digital marketing.

Outline: the study is set out as follows. Section 2 provides the literature review, the study's self-research model, and its corresponding hypotheses. This is followed by Section 3, which presents the research methodology. Section 4 provides the data results and discussion. Section 5 discusses the study's results and its theoretical contributions and practical implications, alongside limitations and future research.

# 2. Literature Review

# 2.1. Social Media Features (SMF)

Social media platforms have become a tool of influence in almost every sector, including banks. Their effectiveness has been proven and is linked to customers' connections, the building of brands, increasing sales, loyalty, etc. [1–4]. They allow two-way communication—e.g., the exchange of feedback and views about the business. People use social media, e.g., to share their experiences with others, including companies, through

Electronics **2023**, 12, 1822 3 of 15

posts, tweets, likes, etc. [20]. This, in turn, can affect business relationships and customers' attitudes and perspectives about the business, which is seen as extremely valuable for any business wanting a better understanding of their customers' perceptions. In the last decade or so, Arab countries have increased their use of the Internet and social media for various matters, including marketing [2,17]. For their perceived ease-of-use and usefulness, social media sites are commonly used by Arab (non)-profit businesses, including governmental bodies, for advertising, promotion, awareness, and interaction [11]. For example, Alzahmi [6] examined how Islamic banks in the UAE employ social media marketing (e-marketing) to enhance their relationships with customers and how customers' attitudes toward banking services can be used to improve their quality. He found a strong relationship between the adoption of e-marketing and banking services. Tashtoush [21] also examined the effectiveness of social media (e.g., Facebook) on the buying decisions of commercial banks' customers in Jordan and found that they affected customers' buying behavior by 73%, factor linked to interactivity.

Furthermore, most Arab Internet users use the Internet for various reasons [22], including online shopping and accessing different services, e.g., viewing online banking services [19,23]. Online users interact and engage with companies by keeping an eye on promotional offers while engaging in their normal online activities. It is the Internet and social media that allow this, and marketing has come to rely heavily on this process, becoming an important everyday part of any sector, including banks [7]. Through their ease-of-use, usefulness, cost, etc., social media platforms have allowed many firms to introduce their products or services and market them [8]. The growing number of Internet and social media users in Jordan is itself an indication that users can communicate and share information (feedback) with firms. For example, not only do users read online content, but they become content producers, sharing different visual and non-visual content. Veland et al. [24] indicated that social media marketing is a multi-channel platform used to influence users' interest in making purchases or in using a service [25].

Social media platforms have several features (a simple and friendly user interface, visually appealing design, content-sharing methods, messaging systems, real-time notifications, etc.) which have changed the structures in the commercial sector, developing a new and amazing variety of modern client that is hard to impact, to convince, and to retain [26]. Social media can help any business in terms of attracting customers, increasing marketing reach and revenue, and building customer loyalty. Studies confirm the power of SMM in shopping decisions [27], brand development [28], interactivity [21], and purchase intentions [29,30]. For example, Tashtoush [21] indicated that social media in Jordan have a role in affecting customers' buying behavior (by providing information, messages, etc.), especially when it comes to making buying decisions, and Permatasari and Laydi [30] found there to be significant influences, in terms of entertainment, economic value, social value, and credibility, on consumer attitudes and thereby on purchase intention. Consequently, we adopted the two main factors of the TAM model to explore how online users perceive online banking services, and whether the use of SMF in banking services can affect customers' behavioral intention and loyalty [23].

# 2.2. Electronic Word of Mouth (EWM)

Word of mouth, generally, is the transmission of information through talking between individuals regarding something in general, or specific goods and services, either positively or negatively [2,31]. With the rapid growth in Internet usage, the way in which online users communicate and share feedback and information with others is now known as electronic word of mouth (EWM) [32,33]. This refers to a form of communication, based on electronic means [34], that is used to influence customers' attitudes and behaviors. It plays a crucial role in promoting any business [27,32] because information through EWM is regarded as highly credible and trustworthy [35].

With the advancing of social media, EWM is often seen as an influential, speedy, and effective platform [36,37]. For example, today's customers tend to look for informa-

Electronics **2023**, 12, 1822 4 of 15

tion/feedback posted by previous customers (with repetitive reviews from customers) prior to deciding to do something, e.g., online shopping [38]. Sharing experiences regarding use/purchase of goods, products, and services, motivates/(dis)encourages others to buy/use certain goods/services [27,31].

Customers consider EWM, circulating among themselves, as more credible than promotional operations [39]. Ying et al., [40] applied the TAM model to the intent of electronic purchase and found a positive effect of word of mouth in motivating customers during the purchase process. Others have indicated that online reviews can have an impact (positive/negative) on influencing users to get the services provided. Reviews/feedback can be used as company feedback to improve its services/goods/products [33], suggesting that EWM can be used by a company to obtain more users. EWM, therefore, can promote brand awareness and lead to customer loyalty based on the concept of perceived usefulness and perceived ease of use [37].

# 2.3. Informativeness (INF)

Information can be seen as a motivation in customers' responses to marketing ads [35]. Online customers' intent to purchase/use a product or a service is based on information (and that information's accuracy, usefulness, and comprehensiveness) that they receive from friends' reviews or recommendations, etc. [41,42]. Lee and Hong [42] have indicated that informativeness is one of the factors influencing users' responses to social media ads. The abundance of information displayed and available about goods/services is a key matter for customers [41]. Yadav and Rahman [43] have indicated that informativeness is important for online customers in purchasing goods/services, especially in the online environment—e.g., the more information that users gain/receive about certain services/goods, the more able they are to decide on whether to purchase such services or even to recommend them to others [35].

The TAM model, through perceived usefulness and perceived ease-of-use, helps us to understand customers' behavioral intentions in terms of accepting a system/service, e.g., online banking information. Social media platforms have enhanced customers' ease-of-use regarding all information and the easy and smooth achievement of what is required [44]. Kim et al. [45] examined the impact of the TAM model on online marketing and advertising and found that online advertising affected users' perception of information's usefulness and ease of use.

## 2.4. Customer Loyalty (CL)

Customer loyalty (online/offline) is often referred to as customers' behavior toward a particular brand, proven by their inclination to use the brand regularly [10,46]. It is a very important aspect, in terms of driving revenue, for any business [47]. Loyalty is also an integral factor in the customer-brand relationship [17]. Studies of customer behavior indicate that success and increased profitability in any business are very much linked to outcomes of loyalty regarding a brand—e.g., a positive attitude, trust, customer satisfaction [32,34], and additional purchases [35]—through encouraging loyal customers to spend/buy more. Studies refer to customer loyalty as the repeated use, in terms of purchasing, of a specific platform, resulting in loyalty to the same platform [10]. Communication through online banking services is a good opportunity for a business to create a positive customer experience if the bank understands the benefits when it comes to customer loyalty, which is highly recommended, as Taylor et al. [48] stated. For example, when customers prefer the same brand, they tend to recommend it to family and friends [47]. This means that customers intend to sustain the valued relationship with the brand. In other words, loyalty can indicate the behavioral intention of a customer's willingness to revisit the brand for further services [32].

Electronics **2023**, 12, 1822 5 of 15

# 3. Hypothesis Development

The hypotheses developed in this research were based on a robust foundation derived from related research. Social media marketing factors (e.g., social media features, electronic word of mouth, and informativeness) were used as external variables alongside the two main TAM model components (perceived usefulness and perceived ease of use) for our conceptual customer loyalty framework. We empirically tested the proposed model in the context of social media marketing, or e-marketing, by recruiting users of online banks in Amman, the capital of Jordan, to determine users' behavioral intention in understanding the effectiveness of social media marketing on customer loyalty, and those factors that influenced such a relationship in the era of social media, using the TAM model to identify users' behavioral intentions. One example is how users and their behavioral intention toward online banking services can be impacted by their attitude. Based on the preceding discussion, it is plausible to suggest the following hypotheses:

- **H1a.** Social media features (SMF) have a positive effect on perceived usefulness (PU).
- **H1b.** Social media features (SMF) have a positive effect on perceived ease-of-use (PU).
- **H2a.** Electronic word of mouth (EWM) has a positive effect on perceived usefulness.
- **H2b.** *Electronic word of mouth (EWM) has a positive effect on perceived ease of use.*
- H3a. Informativeness (INF) has a positive effect on perceived usefulness.
- **H3b.** *Informativeness (INF) has a positive effect on perceived ease of use.*
- **H4.** Perceived ease of use (PEU) has a positive effect on perceived usefulness (PU).
- **H5.** Perceived usefulness (PU) has a positive effect on behavioral intention (BI).
- **H6.** *Perceived ease of use (PEU) has a positive effect on behavioral intention (BI).*
- **H7.** Behavioral intention (BI) has a positive effect on customer loyalty (CL).

# 4. Research Methods

# 4.1. TAM Model

Studies have applied different theories and models (e.g., the unified theory of acceptance and use of technology (UTAUT), the theory of planned behavior (TPB), and the technology acceptance model (TAM)) to explore and understand users' adoption of behavioral intentions in terms of technology acceptance, including understanding customers' loyalty in accepting services based on social media marketing. However, because this study focuses on SMM in relation to customer loyalty in Jordan, the TAM model is a broad model for comprehending online users' acceptance of information technology, as introduced by Davis [49]. The proposed model (Figure 1) showed the possibility of enhancing the loyalty of Jordanian bank customers through SMM with the TAM model.

The TAM model is considered as a fundamental model in technological adoption, which explains the process and perception of users' adoption intentions and behaviors in accepting new technology [49]. The model suggests two main structures: perceived ease of use and perceived usefulness. The former refers to a potential user's perception, e.g., of online banking services, as providing a needed service, and—with ease of use—they will be more likely to use such a service. The latter refers to the extent to which a technology is expected to improve a potential user's performance [50]. In the case of online banking services, the two structures are considered as influencing customers [37]. Mulia et al. [51] stated that there is a positive relationship between the perceived ease of use and perceived usefulness of online banking services and the achievement of loyalty.

Electronics **2023**, 12, 1822 6 of 15

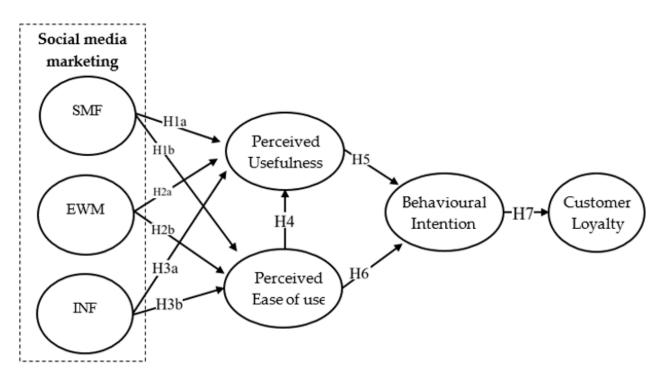


Figure 1. Our conceptual customer loyalty framework.

## 4.2. Data Collection and Sample

In order to understand the effects of SMM on customers' loyalty regarding online banking services, specifically the Bank of Jordan in Amman, the study targeted respondents who indicated (during a screening question) that they used online banking services. In doing so, an online survey (Google.Form) was developed and shared online at the peak of the COVID-19 period (October and November 2021). Due to COVID-19 restrictions in Jordan, the study used the purposive convenience-sampling approach in which the drawn samples were easily accessible and willing to take part in the study. All participating users had used the Bank of Jordan's online services at least once.

Furthermore, ethical approval was sought from the Yarmouk University Faculty of Mass Communication—Research Ethics Committee (Ref. 112-102-2021). The respondents were informed that their participation in the research was entirely voluntary and that the research was completely anonymous and confidential. A total of 345 surveys were collected and prescreened based on the users' social media experiences. As a result, 16 incomplete responses were excluded, leaving 329 valid responses for formal data analysis.

# 4.3. Instrument and Measurement

As mentioned above, to measure SMM's impact on customer loyalty, a 26-item survey was developed by the authors to investigate the seven research hypotheses (see Appendix A). Most of these items were adopted from early research, but some were modified/amended to fit with the nature of the respondents targeted in Jordan. Before proceeding with and distributing the online survey, two procedures were followed. First, items were checked by three academics, and second, the internal reliability and validity tests (through a pilot study) were run to identify any potential problems in the study, and to ensure greater clarity and coherence in the research instrument.

The pre-structured survey had three parts. Part 1 provided information and instructions about the nature of the research and its objectives, and a screening question to target those who only used the Bank of Jordan's online services. Part 2 asked the respondents to state their demographic details (e.g., gender, age, and education level). Part 3 measured the seven constructs mentioned above that represent the perceptions of respondents toward SMM's impact on customer loyalty enhancement. Each construct was measured with three

Electronics **2023**, 12, 1822 7 of 15

or six items. For instance, SMF was measured with three items,  $\alpha = 0.804$ ; EWM was measured with three items,  $\alpha = 0.734$ ; INF was measured with four items,  $\alpha = 0.744$ ; PU was measured with six items,  $\alpha = 0.837$ ; PEU was measured with three items,  $\alpha = 0.826$ ; BI was measured with four items,  $\alpha = 0.756$ ; and CL was measured with three items,  $\alpha = 0.837$ .

#### 5. Results

# 5.1. Descriptive Statistics

Of the 329 respondents, 53% were male and 47% were female. The highest number of respondents were those aged +45 years old (54.5%), followed by those aged 36–45 (30%), and those aged 25–35 (15.5%). Their education level indicated that the majority had a bachelor's degree (85.8%), whereas 10.6% (n= 34) had an MA degree, and 3.6% had a doctoral degree. Moreover, most respondents indicated that they lived in urban areas (50.9%), whereas 26.1% lived in Bedouin areas and 23% in rural areas. Finally, most respondents were married (97.3%), and 2.4% were single.

To evaluate the normality of the data, the skew and Kurtosis tests were run, using SPSS. The results show that the data were not in the range of normality (skew < 2, Kurtosis < 9). Hence, because of the non-normal distribution of data, the relationship between variables was further investigated, using SmartPLS 3, which was not sensible to the normality of the data (Table 1).

T-1-1 - 1	Tl	146		1 - 4:	1	variables.
Table 1.	The resu	IIS OF	corre	iations	petween	variables.

	1	2	3	4	5	6	7	8	9	10	11
1. Gender											
2. Age	-0.023										
3. Education	-0.021	0.074									
4. Location	-0.029	-0.037	-0.051								
5. Social	-0.075	0.036	0.081	0.079							
status	-0.073	0.030	0.001	0.079							
6. SMF	0.018	-0.048	0.014	-0.028	-0.022						
7. EWM	0.058	-0.046	-0.014	0.016	-0.034	0.586 **					
8. INF	-0.029	-0.100	0.004	-0.014	0.003	0.639 **	0.695 **				
9. PEU	0.038	-0.103	0.047	0.007	-0.016	0.618 **	0.578 **	0.727 **			
10. BI	0.058	-0.070	0.029	-0.064	-0.080	0.473 **	0.560 **	0.614 **	0.629 **		
11. CL	0.086	-0.027	0.001	-0.046	-0.030	0.420 **	0.529 **	0.574 **	0.517 **	0.605 **	
12. PU	0.027	0.108	-0.045	-0.028	-0.099	0.691 **	0.583 **	0.561 **	0.490 **	0.501 **	0.435 **

Note: SMF = social media features; EWM = electronic word of mouth; INF = informativeness; PEU = perceived ease of use; PU = perceived usefulness; BI = behavioral intention; CL = customer loyalty. \*\* p < 0.01, 2-tailed.

# 5.2. Measurement Model Test

The path analysis in SmartPLS was used to test the measurement model's validity and reliability, and the validity of our research was tested through the convergent validity test. Table 2 shows factor loading (FL), Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE). According to Table 2, all factor loadings are more than 0.6, which meets the criteria of satisfactory validity [52]. For example, the values of Cronbach's alpha, composite reliability, and AVE for each variable are more than 0.7, 0.7, and 0.5 respectively, indicating the satisfactory range of the validity and reliability criteria.

Table 2. Factor-loading results.

Factors	Items	FL	CA	CR	AVE
Social media features (SMF)	3	0.819-0.844	0.804	0.884	0.719
Electronic word of mouth (EWM)	3	0.765 - 0.832	0.734	0.850	0.653
Informativeness (INF)	4	0.704 - 0.808	0.744	0.839	0.566
Perceived usefulness (PU)	6	0.696 - 0.794	0.837	0.881	0.552
Perceived ease of use (PEU)	3	0.851-0.869	0.826	0.896	0.742

Electronics 2023, 12, 1822 8 of 15

Table 2. Cont.

Factors	Items	FL	CA	CR	AVE
Behavioral intention (BI)	4	0.734-0.793	0.756	0.846	0.578
Customer loyalty (CL)	3	0.770 - 0.830	0.738	0.851	0.657

Moreover, to ensure the discriminant validity of the measurement model, heterotrait—monotrait ratio (HTMT) was used (acceptable values < 0.85), as shown in Table 3.

**Table 3.** Discriminant validity test using the heterotrait–monotrait ratio (HTMT).

Item	BI	CL	EWM	INF	PEU	PU
Customer loyalty (CL)	0.821					
Electronic word of mouth (EWM)	0.896	0.835				
Informativeness (INF)	0.874	0.839	0.858			
Perceived ease of use (PEU)	0.761	0.681	0.735	0.823		
Perceived usefulness (PU)	0.804	0.752	0.888	0.894	0.614	
Social media features (SMF)	0.682	0.635	0.832	0.867	0.701	0.882

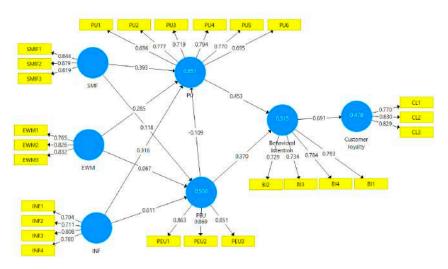
# 5.3. Hypothesis Testing

To test the hypothesis, the PLS model was run, using the PLS algorithm and a bootstrapping resampling mood (300 samples). Table 4 shows the goodness-of-fit indices for the model.

**Table 4.** The goodness-of-fit of the model.

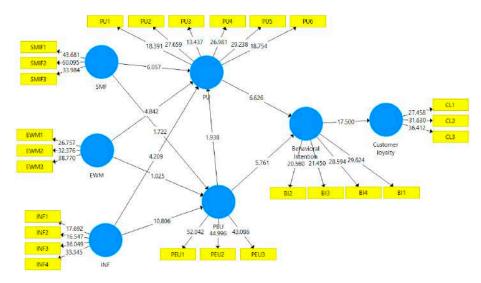
	Estimated Value in N	A acomtoble Value		
Index	Structured Model	Estimated Model	— Acceptable Value	
SRMR	0.077	0.098	<0.1	
NFI	0.986	0.988	>0.9	
RMS_theta	0.107		<0.12	

As shown in Table 4, the fits of the estimated and structural models were confirmed. Specifically, the value of SRMR was less than 0.10 [53], which indicated a satisfactory fit. Furthermore, the estimation of NFI reaching a more than the satisfactory value of 0.9 [54]. Finally, the value of RMS\_theta was less than 0.12 [55], indicating a good fit. Figures 2 and 3 show the research model in the algorithm and the bootstrapping mode.



**Figure 2.** Path coefficients.

Electronics **2023**, 12, 1822 9 of 15



**Figure 3.** The model with bootstrapping mode, *t*-value.

Figure 2 shows that all coefficient of determination values ( $R^2$ ) were in the satisfactory range [56] considered  $R^2$  values of 0.75, 0.50, and 0.25 as substantial, moderate, and weak values, respectively. According to the  $R^2$  values, 0.65% of the perceived usefulness changes can be predicted by the present model. Moreover, 55% of the perceived ease of use changes, 51% change of the behavioral intention, and 47% of the changes in customer loyalty can be predicted by the model.

Based on Figures 2 and 3, the 10 hypotheses were supported by data, as the *t*-values of their relations are more than 1.96. However, the effect of social media features on perceived ease of use, that of electronic word of mouth on perceived ease of use, and that of perceived ease of use on perceived usefulness were not supported by the data. Accordingly, the result of the testing hypothesis is fully represented in Table 5.

Hypothesis	Relationship	SD	<i>t</i> -Value	β	Sig.
H1a	Social media features => Perceived usefulness	0.065	6.057	0.393	0.000
H1b	Social media features => Perceived ease of use	0.068	1.722	0.118	0.086
H2a	Electronic word of mouth => Perceived usefulness	0.059	4.842	0.285	0.000
H2b	Electronic word of mouth => Perceived ease of use	0.066	1.025	0.067	0.306
H3a	Informativeness => Perceived usefulness	0.075	4.209	0.316	0.000
H3b	Informativeness => Perceived ease of use	0.057	10.806	0.611	0.000
H4	Perceived ease of use => Perceived usefulness	0.056	1.938	-0.109	0.005
H5	Perceived usefulness => Behavioral intention	0.068	6.626	0.453	0.000
H6	Perceived ease of use => Behavioral intention	0.064	5.761	0.370	0.000
H7	Behavioral intention => Customer lovalty	0.040	17.500	0.691	0.000

Table 5. Hypothesis testing.

Eight out of the ten hypotheses were supported (Table 5). In detail, the results show that social media features can positively predict perceived usefulness ( $\beta$  = 0.393, p = 0.000), confirming H1a. However, the impact of social media features on perceived ease of use was not supported by the data ( $\beta$  = 0.118, p = 0.086), rejecting H1b. In the same vein, the results show that electronic word of mouth has a positive significant effect on perceived usefulness ( $\beta$  = 0.285, p = 0.000), and the effect of electronic word of mouth on perceived ease of use was not supported ( $\beta$  = 0.067, p = 0.306), supporting H2a.

Moreover, the positive effect of informativeness on both perceived usefulness and perceived ease of use was confirmed, supporting H3a and H3b. However, the results also show that perceived usefulness has an insignificant effect on perceived ease of use ( $\beta = -0.109$ , p = 0.053), rejecting H4. The effect of perceived usefulness on behavioral intention was supported ( $\beta = 0.453$ , p = 0.00), supporting H5. Similarly, the results show

that perceived ease of use can predict behavioral intention significantly ( $\beta$  = 0.370, p = 0.00), supporting H6. Finally, the effect of behavioral intention on customer loyalty was supported ( $\beta$  = 0.691, p = 0.00), confirming H7.

## 6. Discussion

The results of data analysis have generally proved the hypothesis stated in our research model (Figure 3), using the purposive convenience-sampling approach with a sample of 329 respondents. For example, there is evidence that SMM is affected by social media features, informativeness, and electronic word of mouth, which can lead to the achievement of customer loyalty in online banking [3,19]. In this study, however, we argue that customer loyalty in Jordan, and its contribution to the legacy of any profit and non-profit businesses, including banks, are not fully understood. The objectives of this study, therefore, are to understand the role of social media marketing in enhancing customers' attitude and loyalty, especially when it comes to online banking services in Jordan [13,21]. Our study filled this gap by exploring the role of SMM and the two main TAM model factors in relation to online banking loyalty in Jordan, and the factors that influence such relationships in the era of social media and digital technologies.

With respect to social media features, the findings confirmed that these have an impact (for online banking), as does perceived usefulness, but not perceived ease of use [8,56]. These results indicate that, although respondents appreciate the role of SMF, they do not find them easy to use when it comes to online banking services. This is an indication that the online banking system needs to pay more attention to social media features to enable customers to engage with the banks [8,14,57,58].

The assumption that SMM is a key part of any online business is proven by our data [59], suggesting that SMM continues to establish new ways of business collaboration and effective communication, though, e.g., electronic word of mouth, which is becoming more effective at supporting customers and businesses [32,36,37]. Online users can provide reviews of a product/service electronically, and in theory, EWM has an unlimited capacity to support, impact, and influence other users' access to the services provided [1,31,32]. However, our results confirmed that, although respondents understood the usefulness of EWM in SMM, they did not find such platforms easy to use, suggesting that online banking needs to understand the role of EWM in providing feedback to improve services/products [37,38,40].

Finally, in relation to informativeness, it seems that online banking services understand the importance of information technology and SMM as key factors in customer loyalty. In doing so, they make information available for their customers through perceiving its usefulness and its ease of use. In fact, it seems that SMM helps customers' behavioral intentions to accept a system/service/product, as Kim et al. [45] and Thaker et al. [44] indicated.

## 6.1. Theoretical Contributions and Practical Implications

This study conceptually developed an integrated framework, empirically validated customers' loyalty in the context of online banking services, and presented several theoretical contributions. First, we identified that specific SMM affected customers' loyalty in Jordan by employing the TAM model. The TAM model would benefit from linking such factors and discussion in the field of banking. In addition, this appears to be the first research, at least in Jordan, that integrated SMM into a single framework. As a result, our integrated model classified several factors that would help bank managers to improve their understanding of SMM in relation to customers' loyalty. Second, this research has also contributed to SMM research literature, which can not only enrich the TAM model, but also consider behavior, especially in terms of using informativeness, electronic word of mouth, and customer loyalty (online banking). In other words, factors such as social media features, informativeness, and electronic word of mouth can play a key role in enhancing customers' bank loyalty in Jordan [59].

# 6.2. Theoretical Practical Implications

In terms of practical implications, this study also provides a framework for online banking administrators to improve customers' loyalty and encourage them to adopt and accept more online services. For example, our findings have indicated that SMM factors (e.g., SMF, INF, and EWM) and TAM model factors (mainly perceived ease of use and perceived usefulness) can affect and provide increased customer loyalty, meaning that more customers find SMM helpful, leading them to stick to this platform (online sphere). To make this happen, bank managers need to focus on both information content and its delivery (e.g., applications). This is because SMM was found to have an impact on customer loyalty.

To boost customer loyalty, bank managers might need to focus more on launching exclusive information content through social media features and electronic word of mouth. These platforms are proven to be effective in promoting online banking services and products. This means that banks might need to invest in SMM to gain a better understanding of their customers' consumption habits and to offer them the most compelling bank content. This should lead to improving and measuring customers' loyalty and users' online experience.

#### 7. Conclusions

The importance of SMM and its role in online marketing in achieving customer loyalty cannot be ignored [3,19]. Our study aimed to explore the role of SMM in terms of customer loyalty in Jordan, and the factors that influence such a relationship, using the TAM model for identifying users' intentions. Data were collected through an online survey of 329 users of online banking services and were analyzed using the PLS model to test 10 hypotheses. Evidence emerged from our findings to show that perceived usefulness strongly affects electronic word of mouth, informativeness, and social media features; and perceived ease of use is indirectly linked to these factors [35]. In other words, respondents found social media marketing to be a useful platform for conducting information about bank services, but at the same time, they did not find it easy to use. There is no clear answer as to why respondents indicated such findings.

Our, results also highlighted that respondents' behavioral intentions were strongly affected by both the perceived usefulness and the ease of use of online banking services. It seems that social media marketing activities can have a vital role in building customer behavior, e.g., in buying products [38]. Our findings contribute to the literature by integrating SMF, EWM, and INF into a single framework. This means that these factors are directly affecting customers' loyalty to banks. Scholars, managers, stakeholders, and practitioners in e-marketing and digital media technology need to consider such findings when communicating with customers in long-term relationships.

## Limitations and Future Research

As for the limitations, the first point is that our research did not target any particular social media site, and this is acknowledged as a limitation. Second, data collection was also problematic, as we focused on only one bank in Jordan. Thus, our findings should be understood and interpreted with caution, as they were merely generalized by those participating in the research. Third, the research was based on a purposive convenience-sampling approach, which has its own limitations. Fourth, we examined only three elements in relation to SMM and two elements measuring the TAM model. We believe that other factors might influence customers' loyalty in addition to the factors discussed in this research. Such factors need to be examined, e.g., emotional psychological factors such as motivation, perception, emotions, and attitude. Based on our results and efforts, however, we suggest that more studies be conducted within the nation and region to examine SMM by using the same or other factors to provide a more comprehensive and precise analysis of how SMM affects customers' loyalty toward banks.

Electronics 2023, 12, 1822 12 of 15

**Author Contributions:** Conceptualization, M.H.; Methodology, M.E.; Software, M.E.; Investigation, W.M.A.-R.; Resources, M.H. and W.M.A.-R.; Data curation, M.N.A.a. and W.M.A.-R.; Writing—original draft, M.H., A.S. and M.N.A.a.; Writing—review & editing, R.W.A.; Supervision, A.S.; Project administration, M.H. and M.E; Funding acquisition, R.W.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research was financially supported by the Financial Department, Zarqa University, Jordan.

**Data Availability Statement:** The data presented in this study are available through this link: https://data.mendeley.com/datasets/f89dc85fwk (accessed on 17 March 2023).

**Acknowledgments:** Princess Nourah bint Abdulrahman University Researchers support project (PNURSP2023R 343), Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia.

**Conflicts of Interest:** The authors declare no conflict of interest.

# Appendix A

The questionnaire.

Demographic information.

Gender:		□ Male	$\square$ Female	
Age	:	□ 25–35	□ 36–45	□ More 45
Edu	cation degree:	☐ Bachelor	□ Master	□ PhD
Living location:		□ Urban	□ Rural	☐ Bedouin (Desert)
Soci	al status:	□ Single	☐ Married	□ Widowed.
Soci	al media features			
1	Their social medi	a is enjoyable.		
2	Their social medi	a is pleasing.		
3	Using social med	ia can improve my shopp	oing performance.	
4	Using social med	ia can increase my shopp	oing productivity.	
Wor	d of mouth			
1		opportunity, I am willing alt with friends and relati		ages of the bank of
2	I encourage my f	riends and relatives to bu	y cards/accounts/loan b	oanks of Jordan.
3	I am proud to tell card/accounts/lo	l my friends and relatives oan.	s that I have chosen a goo	od quality
4	I always introduc	ce the cards/accounts/loa	an bank of Jordan to ever	yone when possible.
Info	rmativeness			
1	Social media are	good sources of product	information.	
2	Social media sup	plies relevant information	n.	
3	Social media is in	formative about the banl	ks' products.	
Perc	eived ease of use			
1	The social media	platforms make it easy fo	or you to find the content	you need
2	Social media plat	forms provide useful cor	itent.	
3	The social media Jordan service.	platforms make it easy fo	or you to choose what yo	u want to bank of
4	I find it easy to go	et the social media platfo	rms to do what I want it	to do.

Per	ceived usefulness					
1	Using social media platforms enhances my effectiveness on the bank of Jordan service.					
2	Using social media platforms makes it easier to bank of Jordan service.					
3	Using social media platforms improves my bank of Jordan service.					
4	Overall, I find the social media platforms useful in my bank of Jordan service.					
Cu	stomer loyalty					
1	I consider myself to be loyal to the bank of Jordan.					
2	The bank of Jordan would be my first choice.					
3	I will not buy other brands if the bank of Jordan product is available at the store.					

# References

- 1. Shankar, A.; Jebarajakirthy, C. Ashaduzzaman How do electronic word of mouth practices contribute to mobile banking adoption? *J. Retail. Consum. Serv.* **2019**, *52*, 101920. [CrossRef]
- 2. Alghizzawi, M. A survey of the role of social media platforms in viral marketing: The influence of eWOM. *Int. J. Inf. Technol. Lang. Stud.* **2019**, *3*, 54–60.
- 3. Cao, Y.; Qin, X.; Li, J.; Long, Q.; Hu, B. Exploring seniors' continuance intention to use mobile social network sites in China: A cognitive-affective-conative model. *Univers. Access Inf. Soc.* **2020**, *21*, 71–92. [CrossRef]
- 4. Milla, A.C.; Mataruna-Dos-Santos, L.J. Social Media Preferences, Interrelations Between the Social Media Characteristics and Culture: A View of Arab Nations. *Asian Soc. Sci.* **2019**, *15*, 71–77. [CrossRef]
- 5. Lim, J.S.; Hwang, Y.; Kim, S.; Biocca, F.A. How social media engagement leads to sports channel loyalty: Mediating roles of social presence and channel commitment. *Comput. Hum. Behav.* **2015**, *46*, 158–167. [CrossRef]
- 6. Alzahmi, A. Electronic marketing for financial services: A case study on Islamic banks in the United Arab Emirates. *Int. J. Innov. Eng. Res. Technol.* **2020**, *7*, 110–116.
- 7. Sharma, M.; Banerjee, S.; Paul, J. Role of social media on mobile banking adoption among consumers. *Technol. Forecast. Soc. Chang.* **2022**, *180*, 121720. [CrossRef]
- 8. Onarelly, A.K.; Tantuah, N.; Satria, H.W. The effect of social media e-marketing towards consumers shopping behavior. *J. Vokasi Indones.* **2018**, *6*, 1. [CrossRef]
- 9. Evans, D.; Bratton, S.; McKee, J. Social Media Marketing; AG Printing & Publishing: Middlesex, UK, 2021.
- 10. Urdea, A.-M.; Constantin, C.P. Exploring the impact of customer experience on customer loyalty in e-commerce. *Proc. Int. Conf. Bus. Excel.* **2021**, *15*, 672–682. [CrossRef]
- 11. Habes, M.; Elareshi, M.; Safori, A.; Ahmad, A.K.; Al-Rahmi, W.; Cifuentes-Faura, J. Understanding Arab social TV viewers' perceptions of virtual reality acceptance. *Cogent Soc. Sci.* 2023, 9, 2180145. [CrossRef]
- 12. Al Zoubi, M.I.; Al Zoubi, A.I. An Investigation of Factors Affecting E-Marketing Customers' Behavioral Intention to Use the Telecommunication Industry in Jordan. *Int. J. Mark. Stud.* **2019**, *11*, 125. [CrossRef]
- 13. Husnain, M.; Akhtar, W. Relationship Marketing and Customer Loyalty: Evidence from Banking Sector in Pakistan. *Glob. J. Manag. Bus. Res.* **2015**, *15*, 1–14.
- 14. Priansa, D.J.; Suryawardani, B. Effects of E-Marketing and Social Media Marketing on E-commerce Shopping Decisions. *J. Manaj. Indones.* **2020**, *20*, 76–82. [CrossRef]
- 15. Singh, S. Social Media Marketing for Dummies; John Wiley & Sons: Hoboken, NJ, USA, 2010.
- 16. Kemp, S. Digital 2021 Jordan. DataReportal—Global Digital Insights. Available online: https://datareportal.com/social-media-users (accessed on 28 November 2022).
- 17. Ebrahim, R.S. The Role of Trust in Understanding the Impact of Social Media Marketing on Brand Equity and Brand Loyalty. *J. Relatsh. Mark.* **2019**, *19*, 287–308. [CrossRef]
- 18. Voramontri, D.; Klieb, L. Impact of Social Media on Consumer Behaviour. Int. J. Inf. Decis. Sci. 2019, 11, 209–233. [CrossRef]
- 19. Ramanathan, U.; Subramanian, N.; Parrott, G. Role of social media in retail network operations and marketing to enhance customer satisfaction. *Int. J. Oper. Prod. Manag.* **2017**, *37*, 105–123. [CrossRef]
- 20. Jacobson, J.; Gruzd, A.; Hernández-García, Á. Social media marketing: Who is watching the watchers? *J. Retail. Consum. Serv.* **2020**, *53*, 101774. [CrossRef]
- 21. Tashtoush, L. The Effect of Social Media on Consumer Buying Behavior in Commercial Banks. *Saudi J. Bus. Manag. Stud.* **2021**, *6*, 28–38. [CrossRef]
- 22. Ziani, A.-K.; Elareshi, M. The impact of educated users' interactions on social media (Facebook) in the Arab world. *J. Arab. Muslim Media Res.* **2018**, *11*, 25–44. [CrossRef]
- 23. Sharma, B.K.; Bhatt, V.K. Impact of Social Media on Consumer Buying Behavior-A Descriptive Study on Tam Model. *i-Manager's J. Manag.* **2018**, *13*, 34.

24. Ramadani, V.; Demiri, A.; Demiri, S.S. Social media channels: The factors that influence the behavioural intention of customers. *Int. J. Bus. Glob.* **2014**, *12*, 297. [CrossRef]

- 25. Plume, C.J.; Dwivedi, Y.K.; Slade, E.L. The New Marketing Environment. In *Social Media in the Marketing Context*; Elsevier: Amsterdam, The Netherlands, 2017. [CrossRef]
- 26. Constantinides, E. Foundations of Social Media Marketing. Procedia-Soc. Behav. Sci. 2014, 148, 40–57. [CrossRef]
- 27. Sarkar, S.; Khare, A. Influence of Expectation Confirmation, Network Externalities, and Flow on Use of Mobile Shopping Apps. *Int. J. Hum.-Comput. Interact.* **2018**, *35*, 1449–1460. [CrossRef]
- 28. Schivinski, B.; Dabrowski, D. The effect of social media communication on consumer perceptions of brands. *J. Mark. Commun.* **2013**, *22*, 189–214. [CrossRef]
- 29. Wilson, L. 30-Minute Social Media Marketing (SMM) Actions; Emerald Publishing Ltd.: Bingley, UK, 2019; pp. 57–71. [CrossRef]
- 30. Permatasari, A.; Laydi, F. The effects of social media advertising on consumer purchase intention: A case study of Indonesian family start-up enterprises. *Int. J. Technol. Transf. Commer.* **2018**, *16*, 159. [CrossRef]
- 31. Fox, G.; Longart, P. Electronic word-of-mouth: Successful communication strategies for restaurants. *Tour. Hosp. Manag.* **2016**, 22, 211–223. [CrossRef]
- 32. Sosanuy, W.; Siripipatthanakul, S.; Nurittamont, W.; Phayaphrom, B. Effect of electronic word of mouth (e-WOM) and perceived value on purchase intention during the COVID-19 pandemic: The case of ready-to-eat food. *Int. J. Behav. Anal.* **2021**, *1*, 1–16.
- 33. Siagian, H.; Tarigan, Z.J.H.; Ubud, S. The effect of electronic word of mouth on online customer loyalty through perceived ease of use and information sharing. *Int. J. Data Netw. Sci.* **2022**, *6*, 1155–1168. [CrossRef]
- 34. Nurittamont, W. Understanding service quality and service loyalty: An empirical study of mobile phone network service in the central region of Thailand. In Proceedings of the 2016 WEI International Academic Conference, Vienna, Austria, 11–13 April 2016; pp. 140–146.
- 35. Anggraini, V.A.; Hananto, A. The Role of Social Media Marketing Activities on Customer Equity Drivers and Customer Loyalty. *AFEBI Manag. Bus. Rev.* **2020**, *5*, 1–15. [CrossRef]
- 36. Minazzi, R. The digitization of word-of-mouth. In *Social Media Marketing in Tourism and Hospitality*; Springer: Berlin/Heidelberg, Germany, 2015; pp. 21–45.
- 37. Mehrad, D.; Mohammadi, S. Word of Mouth impact on the adoption of mobile banking in Iran. *Telemat. Inform.* **2017**, 34, 1351–1363. [CrossRef]
- 38. Lubis, A.N.; Lumbanraja, P.; Hasibuan, B.K. Evaluation on e-marketing exposure practice to minimize the customers' online shopping purchase regret. *Cogent Bus. Manag.* **2022**, *9*, 2016039. [CrossRef]
- 39. Ku, Y.-C.; Wei, C.-P.; Hsiao, H.-W. To whom should I listen? Finding reputable reviewers in opinion-sharing communities. *Decis. Support Syst.* **2012**, *53*, 534–542. [CrossRef]
- 40. Ying, Z.; Jianqiu, Z.; Akram, U.; Rasool, H. TAM Model Evidence for Online Social Commerce Purchase Intention. *Inf. Resour. Manag. J.* **2021**, 34, 86–108. [CrossRef]
- 41. Wu, R.; Wang, G.; Yan, L. The effects of online store informativeness and entertainment on consumers' approach behaviors: Empirical evidence from China. *Asia Pacific J. Mark. Logist.* **2019**, *32*, 1327–1342. [CrossRef]
- 42. Lee, J.; Hong, I.B. Predicting positive user responses to social media advertising: The roles of emotional appeal, informativeness, and creativity. *Int. J. Inf. Manag.* **2016**, *36*, 360–373. [CrossRef]
- 43. Yadav, M.; Rahman, Z. The influence of social media marketing activities on customer loyalty: A study of e-commerce industry. *Benchmarking* **2018**, 25, 3882–3905. [CrossRef]
- 44. Mohd Thas Thaker, H.; Khaliq, A.; Ah Mand, A.; Iqbal Hussain, H.; Mohd Thas Thaker, M.A.B.; Allah Pitchay, A.B. Exploring the drivers of social media marketing in Malaysian Islamic banks: An analysis via smart PLS approach. *J. Islam. Mark.* **2020**, *12*, 145–165. [CrossRef]
- 45. Kim, Y.B.; Joo, H.C.; Lee, B.G. How to forecast behavioral effects on mobile advertising in the smart environment using the technology acceptance model and web advertising effect model. *KSII Trans. Internet Inf. Syst.* **2016**, *10*, 4997–5013.
- 46. Mahfodz, A. Factors Influencing Customer Loyalty in the e-Commerce ERA: The case Study of Pos Malaysia. Ph.D. Thesis, Asia e University, Subang Jaya, Malaysia, 2020.
- 47. Kanyama, J.; Nurittamont, W.; Siripipatthanakul, S. Hotel service quality and its effect on customer loyalty: The case of Ubon Ratchathani, Thailand during COVID-19 Pandemic. *J. Manag. Bus. Health Educ.* **2022**, *1*, 1–20.
- 48. Taylor, S.A.; Celuch, K.; Goodwin, S. The importance of brand equity to customer loyalty. *J. Prod. Brand Manag.* **2004**, *13*, 217–227. [CrossRef]
- 49. Davis, F.D. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Q.* **1989**, 13, 319–340. [CrossRef]
- 50. Davis, F.D.; Bagozzi, R.P.; Warshaw, P.R. User acceptance of computer technology: A comparison of two theoretical models. *Manag. Sci.* **1989**, *35*, 982–1003. [CrossRef]
- 51. Mulia, D.; Usman, H.; Parwanto, N.B. The role of customer intimacy in increasing Islamic bank customer loyalty in using e-banking and m-banking. *J. Islam. Mark.* **2020**, *12*, 1097–1123. [CrossRef]
- 52. Hair, J.F., Jr.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V.G. Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *Eur. Bus. Rev.* **2014**, *26*, 106–121. [CrossRef]

53. Hu, L.; Bentler, P.M. Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychol. Methods* **1998**, *3*, 424. [CrossRef]

- 54. Lohmöller, J.B. Latent Variable Path Modeling with Partial Least Squares; Physica-Verlag: Heidelberg, Germany, 1989.
- 55. Henseler, J. Partial least squares path modeling: Quo vadis? Qual. Quant. 2018, 52, 1–8. [CrossRef]
- Küpper, T.; Lehmkuhl, T.; Wieneke, A.; Jung, R. Technology Use of Social Media within Customer Relationship Management: An Organizational Perspective. 2015. Available online: <a href="https://www.semanticscholar.org/paper/Technology-Use-of-Social-Media-within-Customer-An-K%C3%BCpper-Lehmkuhl/816a67102dc0c380525df33499c5cc3149a93d2e">https://www.semanticscholar.org/paper/Technology-Use-of-Social-Media-within-Customer-An-K%C3%BCpper-Lehmkuhl/816a67102dc0c380525df33499c5cc3149a93d2e</a> (accessed on 26 November 2022).
- 57. Khraim, H.S. Internet Motives of Users in Jordan, UAE and KSA: A Cross-Cultural Validation of the Web Motivation Inventory (WMI). *Int. J. Mark. Stud.* **2016**, *8*, 138. [CrossRef]
- 58. Habes, M.; Alghizzawi, M.; Elareshi, M.; Ziani, A.; Qudah, M.; Al Hammadi, M.M. E-Marketing and Customers' Bank Loyalty Enhancement: Jordanians' Perspectives. In *The Implementation of Smart Technologies for Business Success and Sustainability*; Springer: Berlin/Heidelberg, Germany, 2023; pp. 37–47.
- 59. Al Kurdi, B.; Alshurideh, M.; Akour, I.; Alzoubi, H.M.; Obeidat, B.; AlHamad, A. The role of digital marketing channels on consumer buying decisions through eWOM in the Jordanian markets. *Int. J. Data Netw. Sci.* **2022**, *6*, 1175–1186. [CrossRef]

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.